Does Sustainable Development benefit from Sovereign Green, Social and Sustainability Bonds?

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Abstract: This study explores the impact of sovereign Green, Social and Sustainability (GSS) bonds on sustainable development pillars; economic, environmental, and social. The study uses panel data as well as cross-country analysis on a sample of 26 countries over a period from 2018-2021. Using fixed effect panel regression, the results provide strong evidence for a favorable impact of GSS bonds on the economic development pillar. However, a negative impact was recorded for the environmental and social development pillars since combating climate change and improving the well-being of individuals in the society needs longer time to reap the benefits. Our study has important practical implications for policy makers and sheds new light for financial managers in firms with financial constraints.

Keywords: Climate change, Carbon Emissions, sovereign GSS Bonds, SDGs, Sustainability.

JEL Classifications: F63, F64, G29, O16, O40, Q56

1. INTRODUCTION

For centuries, economic success has been defined by the triad of capital accumulation, manufacturing capacity expansion, and targeted economic growth (Kuznets, 1973). However, in the late 20th century, scholars opposed this conventional capitalist perspective of growth, highlighting its inadequacy in portraying enhanced living standards. Thus, a more holistic approach has evolved focusing on economic development rather than just growth; considering critical factors such as: health, education, and income

inequality. In the last few years, the objective of all nations has become more ambitious, with a collective commitment to achieve sustainable growth and development.

The main proposition behind sustainable growth and development is the belief in scarcity (a principle that is at the crux of economics as a science) and the efficient allocation of resources in such a way that the economy is growing in output, while also ensuring the ability of future generations to derive value from these same resources. The concept of sustainable growth is multi-faceted as it looks at it through three lenses: economic, social, and environmental. All three of these principles are incorporated in the global agenda for 2030 and the 17 Sustainable Development Goals.

An emerging field has provided economists and policymakers alike with a new toolkit that can be used to solve this conundrum and make it possible for the issue of climate change and economic prosperity to not be a zero-sum game. This new field is green finance and it holds a lot of potential as a catalyst for sustainable economic growth while staying within the two degrees Celsius ceiling imposed by the Paris Climate Accords in 2015. The potential of green finance is such that it has been considered a major determinant of both the shape and turning point of the Environmental Kuznets Curve (Zhou *et al.*, 2020).

Green finance is a method used to finance sustainability-focused projects and ventures that are kind to the environment. It has the capacity to promote social and economic progress while also advancing financial development. However, green finance has yet to fully demonstrate its capability to align financial development with sustainability. This shortfall is partly due to the conflict between corporate interests and environmental needs; critics argue that it is unrealistic to expect firms to forgo short-term profits for the greater good (Gilchrist *et al.*, 2021). Beyond the issue of an insufficient supply of green securities from firms, several financial constraints exist, including investors' lack of knowledge about green finance, which leads to low demand for these products, and the discrepancy between the short-term nature of financial instruments (e.g., green securities) and the long-term investment objectives (Falcone & Sica, 2019). These challenges question the ability of green finance to bridge financial development into sustainability.

This motivated the authors to investigate the relationship between green finance and sustainable development using three aspects of sustainability: economic, environmental, and social. The author attempts to answer the following question: "How does green finance, as indicated by the issuance of sovereign green bonds, impact the three pillars of sustainable development (economic growth, environmental protection, and social equity) across both developed and emerging economies?"

This study positions the role of green finance in directing sustainability which is considered the main concern of all nations. It also contributes to the literature on green finance by employing pool regressions of fixed effect models to explore these relations from a global perspective and construct a measure for the social development pillar. To the best of our knowledge, this is the first paper to employ the GINI adjusted GDP by multiplying Real GDP by the Gini coefficient to account for inequality in income distribution and reflect human development as a proxy for the social development pillar. Moreover, the methodology developed in this study is uncommon in the existing literature as the use of three models to tackle all three pillars of sustainable development is a novel approach. In contrast to previous research that may concentrate on particular areas or nations , this study expands the examination of the influence of green bonds on sustainability to a worldwide level. This advances knowledge of green financing in a wider range of economic environments.

This study consists of a literature review followed by a methodology section then a presentation and discussion of the results obtained as compared to previous literature.

2. LITERATURE REVIEW

Climate change is a highly dynamic and rapidly evolving topic that is of global concern. Climate Change refers to the phenomenon of changing weather patterns caused by greenhouse gas emissions raised from industrial activity. It is concerned with the radical disruption of weather patterns as a result of human activity (Martinez, 2005). Climate change research is not just only concerned about global warming but it investigates long-term social and economic problems (Ravindranath *et al.* 2002).

Green finance is suggested to act in line with Paris agreement and enhance sustainable growth (Alexander *et al.*, 2019; Gabr, and Elbannan, 2023; ; Long *et al.*, 2022; Wang *et al.*, 2022a). OECD defines Green finance as finance tool for attaining economic growth at the same time lower greenhouse gas emissions, and increase efficiency of natural resources use. Whereas the European Commission refers to it as "the process of taking due account of environmental and social considerations in investment decision-making, leading to increased investments in longer-term and sustainable activities" (Berrou, *et al.* 2019: 35). Wang and Zhi (2016) demonstrated that green finance are led by financial institution as a part of desire to save the environment. He *et al.* (2019) demarcated green finance as a financial form that can efficiently allocate financial resources and direct capital flow to low-energy consumption, low-pollution, and high-efficiency industries. Wang *et al.* (2019) described green finance as a tool to integrate

environment protection with economic profits and resolve the conflict between low-carbon economy and economic growth. Respectively, green finance can be a moderator to achieve sustainable development goals through financial sector innovation and development (Wang *et al.*, 2022a; Tran, 2022). Soundarrajan and Vivek (2016) concluded that green finance will change the production mentality of "grow first, clean up later", it will push firms to add value through green activities and create new jobs.

Green finance includes financial instruments; such as green bonds, green insurance, green mortgage, and green credit, that would enhance environmental protection through the reduction of greenhouse gas emissions and energy use, as well as the creation of climate-resilient infrastructure (Debrah et al, 2022, He *et al.* 2019). Green finance does not only target environment protection but also impact social, and governance performance (Wang *et al.*, 2022a). Green Bonds in particular had steadily grew since 2015. High income countries in Europe, North America and East Asia were in the forefront since the conception of green bonds as a viable financial instrument; but lately emerging economies in Latin America and Africa have stepped in (Yeow and Ng, 2021). Figure 1 below highlights the growth in green bonds.

In recent years, there has been an increasing amount of literature empirically investigating the impact of green finance on sustainability. Ren *et al.* (2020) has also showed how green finance would contribute in lowering carbon intensity in China. The authors used a composite index of green
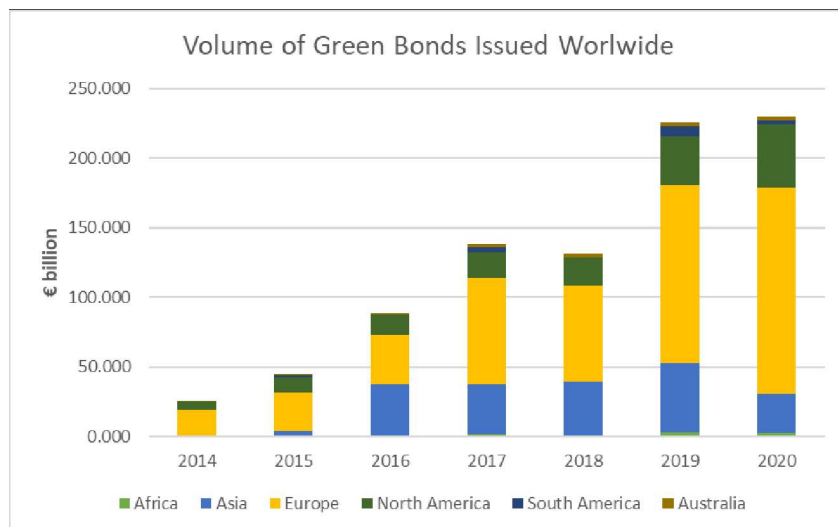

Figure 1: Growth of the Global Green Bond Market

Source: Compiled by Author based on Bloomberg

finance components and instigated the long run and short run causality over 18 years. The article concluded that although in the long run a decrease in carbon intensity was facilitated by rising non-fossil energy use and a rise in green finance development index; in the short run, the development of non-fossil energy was hampered by rising carbon intensity, which also decreased green finance investment and caused the green finance development index to fall. Moreover Wang and Wang (2020); based regression results of 31 Chinese provinces over 15 years, concluded that there is significant impact on green finance and inclusive growth. Further research was empirically tested in China is Lee and Lee (2022), which showed a significant positive relation between green finance; estimated through composite index of green oriented credit, securities, insurance and investment, and total green factor productivity. Since China made the largest issuance of the Green Credit Policy (Rao *et al.*, 2017), other considerable amount of literature have been published evaluating Chinese green finance and investment impact on environmental improvement and different economic aspects such as green technology innovation, tourism, renewable energy investment, fintech and economic development (such as Abbas *et al.*, 2023; Chen and Chen, 2021; Hailind *et al.*, 2023). Few literature have provided empirical investigation using global perspective, such as Khan *et al.* (2019) found that there is significant relation between green finance and CO2 emissions based on data collected for 26 Asian countries and addressed green finance as a climate mitigation tool. Numan *et al.* (2023) concluded; based on a sample of 13 countries, that green finance can reduce the ecological footprint by 0.28%.

It can be viewed that there is an agreement that green finance has positive impact on environment and can contribute in decreasing greenhouse gases impact. Nevertheless, sustainability is three dimension; environmental, social and economic (Purvis *et al.*, 2019). For green finance to act as path for sustainability it should have environmental, social and economic impact. Zhou *et al.* (2020) has evaluated the impact of green finance on economic development and environmental quality for 30 provinces and municipalities in China from 2010 to 2017. Zhou *et al.* (2020) showed that there is a positive relation between green finance and environment improvement in terms of industrial smoke dust emissions, industrial solid waste emissions, and carbon dioxide emissions. The article also demonstrated that the relation between green finance and environment changes the turning point of Environmental Kuznets Curve. Wang *et al.* (2022b) one of few articles that evaluated the impact of green finance on multidimensional perspective of sustainability rather than just environmental perspective. The article stressed on how green finance; measured by Global Green Bond Index, can positively

impact Sustainable development, measured by Environmental, Social and Governance Index.

Since there still few of literature empirically investigated the impact of green finance on three sustainability dimensions, this paper attempts to contribute in this field. The research proposed hopes to confirm the positive impact of green finance on sustainable growth; through three measurements economic growth, environment quality and social development.

3. METHODOLOGY: DATA AND MODEL SPECIFICATION

This study investigates the impact of the value of sovereign GSS bonds on country's sustainable development based on three pillars of sustainability: economic, environmental, and social perspective. Given the relatively recent emergence and adoption of green finance products, respectively the available data is limited to a short run period. A best fit would be a panel data that incorporates a quantitative analysis that quantify the impact of green finance on the three dimensions of sustainability and assists in policy formulation and adjustment. Similar models are employed in finance studies such as: Elbannan & Elbannan (2014), Farooq & ElBannan (2019), Zheng *et al.* 2021

The empirical analysis is based on a panel data from 26 emerging and developed countries in a global context over a period of four years from 2018-2021. The sample consists of 16 developing or newly industrialized countries, and 10 developed countries based on the United Nation classification as published in the World Economic Situation and Prospects (WESP, 2021).

This study adopted three independent variables used in the literature to proxy for the sustainability pillars (Tran, 2022; Wang and Wang, 2020). The economic growth, $\ddot{A}RealGDP_{it}$, measured by the real Gross domestic product (GDP) and collected from the World Bank Databank. The environmental quality aspect, $\ddot{A}CO2_{it}$, is measured by the total carbon emissions in metric tons and collected from Enerdata. The social development, $\ddot{A}GINI^*GDP_{it}$ is proxied by the inequality GINI adjusted GDP, measured by the interaction term between GINI index and GDP, and calculated by the author using data from World Bank Databank to reflect human development.[1]

The main explanatory variable used is the GSS bonds, **GB**, measured as the dollar value of the sovereign GSS bonds and obtained from Thompson-Reuters Database. Further, we controlled for country-specific factors that may impact the level of sustainable development including the Gross capital formulation, *GCF*, and total Labour Force, *LF*, and Urban Population ratio, *UrbanPOP*, where data is collected from the World Bank Databank. In

addition, Net Primary Enrolment ratio, *NPE*, is obtained from the UNDP Sustainable Development Report and used to proxy for education level. The renewable energy, *Renewable*, measured by the percentage of energy consumption from renewable sources.

We employed panel regression with cross-section fixed effects to estimate the below equations (1-3) to predict each sustainability aspect using three different specifications.

Model 1: $\Delta RealGDP_{it} = \beta_0 + \beta_1 \Delta GB_{it} + \beta_2 \Delta GCF_{it} + \beta_3 \Delta LF_{it} + \beta_4 \Delta NPE_{it} + \beta_5 \Delta Renewables_{it} + \beta_6 \Delta UrbanPOP_{it} + \varepsilon_{it}$ (1)

Model 2: $\Delta CO2_{it} = \beta_0 + \beta_1 \Delta GB_{it} + \beta_2 \Delta GCF_{it} + \beta_3 \Delta LF_{it} + \beta_4 \Delta NPE_{it} + \beta_5 \Delta Renewables_{it} + \beta_6 \Delta UrbanPOP_{it} + \varepsilon_{it}$ (2)

Model 3: $\Delta GINI*GDP_{it} = \beta_0 + \beta_1 \Delta GB_{it} + \beta_2 \Delta GCF_{it} + \beta_3 \Delta LF_{it} + \beta_4 \Delta NPE_{it} + \beta_5 \Delta Renewables_{it} + \beta_6 \Delta UrbanPOP_{it} + \varepsilon_{it}$ (3)

4. EMPIRICAL RESULTS

To explore the green finance-sustainable development pillars link, Table 1 represents the pool regression results of fixed effect models used to estimate equations (1-3). We used fixed effect models based on Hausman test result that rejected the null hypothesis that the random effects model is better suited to this study. The significance for fixed effects models implies that there are unobserved variables specific to each entity country that affect the dependent variables. It is notable that in the three models (presented in table 1) the intercepts are significant and of negative values, suggesting that in the absence of changes in other variables, Real GDP is expected to decrease significantly.

Based on the results presented in Table 1, a change in the dollar amount of green bonds issued would result in an increase in change of real GDP of 24.31 and this relationship is statistically significant at the 5% level, implying that sovereign green bonds can be used to increase GDP and stimulate economic and social sustainability. This favorable impact on the country economic development is consistent with the economic theory and the findings of (Zhou *et al.*, 2020) although their results were limited to China.

With regards to carbon emissions, shown in Model (2), the coefficient on ΔGB is positive and highly significant ($p < .001$), though the magnitude of the coefficient appears to be economically too small. In contrast to expectations, the empirical evidence denotes unfavorable impact of issuing GSS bonds on country carbon emissions which may refer to the short duration of the study period where projects funded by the issued green bonds may not reap benefits and required fruits in short-term. In fact, green projects require long-time to reduce carbon emissions and combat climate change (ElBannan and Löffler, 2024).

Table 1: Regressions Results of Panel Data

	Model 1 $\Delta RealGDP_{it}$	Model 2 $\Delta CO2_{it}$	Model 3 $\Delta GINI*GDP$
C	-2.08E+12 ***	-70264628 **	-1.28E+12 ***
	(4.46E+11)	(29340936)	(2.75E+11)
ΔGB	24.317 **	0.00241***	12.63521*
	(11.172)	(0.000735)	(6.900022)
ΔGCF	0.608 ***	-8.85E-05 ***	0.304911***
	(0.158)	(1.05E-05)	(0.097335)
ΔLF	66492.29 **	5. 064 **	45325.91 **
	(32084.19)	(2.111172)	(19815.84)
ΔNPE	2.02E+11 **	-3139601	1.22E+11**
	(8.54E+10)	(5616227)	(5.27E+10)
ΔRenewable	3.11E+10	1293022	2.35E+10
	(6.59E+10)	(4335852)	(4.07E+10)
ΔUurbanPop	5.88E+12 ***	1.47E+08 **	3.62E+12 ***
	(1.07E+12)	(70450678)	(6.61E+11)
Hausman-Test chi2 [prob > chi2]- FE vs RE	0.0049***	0.0001***	0.0061***
R-square	0.818	0.678	0.7996
Adjusted R	0.696	0.461	0.6645
F-statistic	6.699***	3.127***	5.92***
Durbin Watson	2.265	3.634	2.196

***$p<0.01$, **$p<0.05$, * $p<0.1$.

Turning to the third pillar, the social development, we introduced a new measure for inequality adjusted income, where the real GDP is multiplied by the GINI coefficient. Model (3) in Table (1) shows that the estimate of the coefficient on *ÄGB* is positive and significant at the 10% level, indicating that change in GSS bonds value is associated with increase in income-inequality. This result may be because green projects require longer time to detect its influence on human development and improve the well-being of individuals.

Furthermore, *NPE* is significant in models 1 and 3, denoting high expected impact of education on income-inequality, although it turns to be insignificant in model 2. It should be highlighted that change in renewable energy is not significant in the three models, which is a direct conflict with most climate action policy.

Examining other explanatory variables, the results affirm the anticipated impact of GCF, labor force, and urban population on sustainability. Notably, there is a negative impact of GCF on CO2 emissions; however, the correlation coefficient is nearly zero, supporting the notion that changes in CO2 are a long- term phenomenon. Conversely, renewable energy does not exhibit significance in any of the models.

All three models demonstrate relatively high adjusted R-squares (0.696, 0.461, and 0.6645) and significant F-statistics, indicating the goodness of fit for the regression model. Heteroskedasticity and autocorrelation are both absent in the models as evident from the Durbin Watson statistic and the residual plots in figure 2 below.
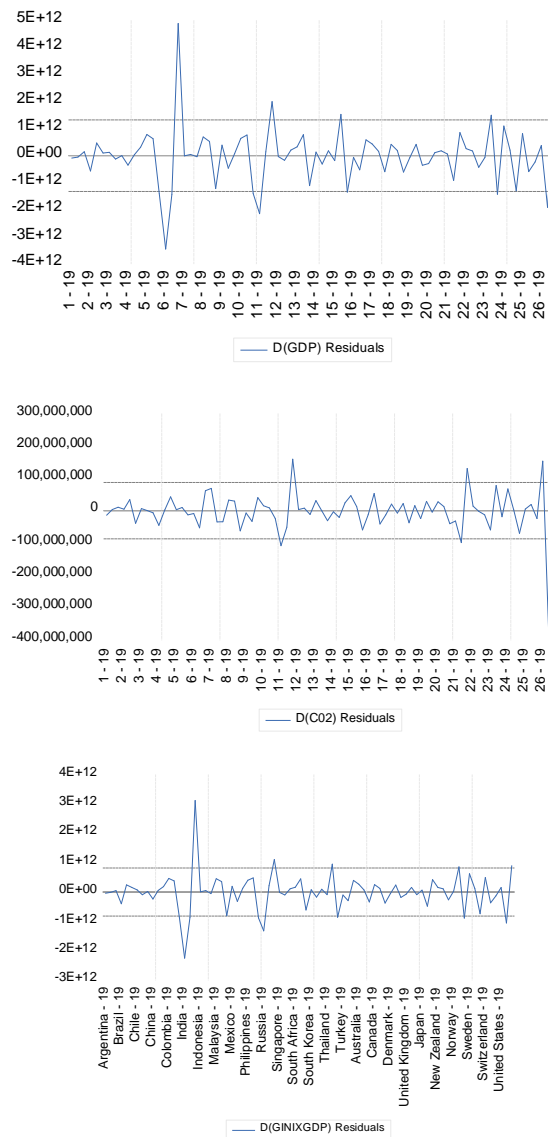

Figure 2: Residual Plot for the three models

Source: Author's own creation

5. DISCUSSION, IMPLICATION AND POLICY RECOMMENDATION

The approach used in this study to estimate the impact of green finance on sustainable economic development in a panel of 26 developed and developing countries is three pronged. Three models were constructed in order to determine the impact of green finance on each pillar of sustainability: economic, environmental, and social. Of the three models, two were adopted from the literature, while the third was the contribution of the author.

According to the previous presented literature, we expect an increase in green finance to have a positive impact on GDP, a positive impact on environmental quality (i.e.: a reduction in carbon emissions). As for the impact on social development there have very few studies to address this relationship, apart from the one conducted in China by Wang and Wang in 2020, so there is no consensus within the economic community with regards to the expected relationship. (Figure 3 below summarizes expected relations based on previous literature).
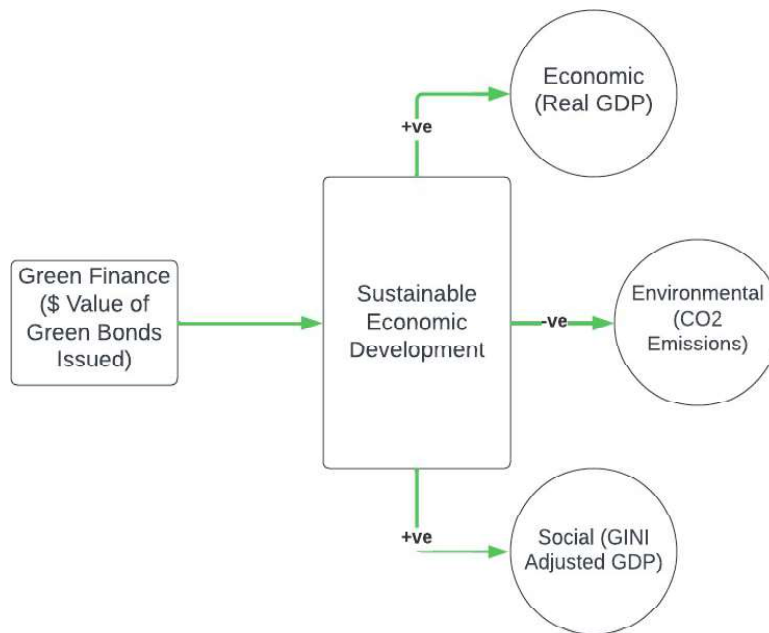

Figure 3: Green Bonds Expected Relation to Sustainable Development

In order to estimate the relationship, the dollar value of sovereign green bonds issued by the government of each country was set as the key independent variable as an indicator of green finance. As stated in the literature review the European Commission defines green finance as "the

process of taking due account of environmental and social considerations in investment decision-making, leading to increased investments in longer-term and sustainable activities" (Berrou *et al.*, 2019: 35), this of course encompasses a myriad of policies that would have been difficult to measure without the construction of a composite indicator for each country in the panel.

The first of the three models was measured using a panel regression with cross-section fixed effects; indication that there are country specific effects that will cause different GDP levels regardless of the impact of the studied variables. This is to be expected because the level of economic performance of a country will differ based on the natural endowments, political climate, among several other factors. The results found that the change in green bonds issued was statistically significant and positive, which falls in line with the theory surrounding the topic, as well as the results obtained by (Zhou *et al.*, 2020). It is worth noting, however, that Zhou *et al.* found green bonds to be significant only in China whereas this paper results have global perspective.

Moving to the environmental pillar of sustainable development, we set change in carbon emissions as the dependent variable. Again, the model used is a panel regression with fixed cross section effects to account for individual country effects. The model was found to have moderate explanatory power with an R-squared of 0.678 and an adjusted R of 0.46. The change in green bonds issued was found to be statistically significant but contrary to the expected relationship it was found to have a positive impact on carbon emissions, which may be due to the short duration of the study so the projects funded by the issued green bonds may not have come to completion or begun to make an impact on the level of carbon emissions. Another key takeaway from this regression is that the change in the share of electricity from renewables was found to be insignificant, which is a direct conflict with most climate action policy.

These results directly contradict the expected relationship from theory, as well as contradicting the results obtained in Vietnam by Tran (2021), and China by Zhou *et al.* (2020). However, it is worth noting that Tran(2021) estimated the impact of green credit and green investment which predate green bonds. Whereas Zhou *et al.* (2020) looked at the impact on overall environmental quality (which includes dust particles, emissions of industrial smoke, and particles of solid waste), and they also conceded that " under different economic development levels, the impact of green finance on environmental indicators is heterogeneous'' (Zhou *et al.*, 2020:19930).

Finally, the third model uses a panel regression with fixed cross-section to investigate the impact of green bonds on social development as measured

by inequality adjusted income, in order to calculate inequality adjusted income the real GDP is multiplied by the GINI coefficient. The choice of indicator is not uncommon in development economics literature (Costanza *et al.*, 2009), and seemed to be a better fit for the purpose of the study than a composite indicator like the Human Development Index or the SDG achievement score which have a higher potential of multicollinearity which violates the assumptions of Ordinary Least Squares regressions The fixed cross section effects take into account country specific factors that may impact the level of social development such as culture, religion, form of government, etc.

These results are in line with the expected relationship as well as the results obtained in China when measuring the impact of green finance on sustainable development using inclusive economic growth as the dependent variable (Wang and Wang, 2020) . While the results from this study lead to a similar conclusion, the differences between them may be due to the indicator used for to measure inclusive economic growth (GINI adjusted GDP as compared to a composite index) or the indicator used to measure green finance (dollar value of green bonds issued as opposed to the green finance index).

When evaluating the value of this research with regards to economic literature it is imperative to look at two aspects: the empirical contribution and the theoretical contribution. Beginning with the empirical contribution, the methodology developed in this paper is uncommon in the existing literature and the use of three models to tackle all three pillars of sustainable development is a novel approach. It is also worth noting that the choice of countries used in the panel is deliberate; the focus of the study is emerging economies such as Brazil, Russia, India, China and South Africa (the BRICS) with some developed economies more commonly analyzed in the literature such as the United States.

On the other hand, the study's contribution to theory is in the purpose of the research; the research aims to map green finance as a determinant of economic development. This is a factor that has not traditionally been viewed as a determinant unlike more well-known determinants such as health, education, investment in human capital, etc. The basis for this decision lies in the pillars of green finance which are echoed in the Green Bond Principles, i.e: that they are characterized based on "1. Use of Proceeds 2. Process for Project Evaluation and Selection 3. Management of Proceeds 4. Reporting" (ICMA, 2022:4), the most important of which with regards to fostering sustainable economic development being the use of proceeds both with respect to the direct impact and the spillover effect that comes from what the issuance of green bonds "signals" to the market.

This also highlight business implications with regards to firms that find themselves suffering from an "investment gap". Firms with business models based in eco-innovation, renewable energy, or even more commercially accepted fields such as electric vehicles that require high capital endowments may struggle to obtain the necessary funds using traditional financing (due to lending restrictions or being associated with high risk) can stand to gain from the issuance of GSS bonds (Sachs *et al.*, 2019).

Based on these contributions we can summarize a set of policy recommendations for sovereign states as well as supranational organizations such as the United Nations, the World Bank Group, and the International Monetary Fund:

The first of these policy recommendations is that countries should invest in the deepening and development of their financial markets to become accustomed to more sustainable financial instruments such as green bonds, social bonds, and sustainability linked bonds. The implications of committing to this from a firm perspective are: creation of value, creating comparative advantage, and staying ahead of impending regulation, whereas on a macroeconomic level economic prospects are increased as countries become more efficient in the use of resources and increased innovation (Soundarrajan and Vivek, 2015).

In order to fully benefit from green finance, the private sector also needs to be involved, they can be encouraged using tax breaks or subsidies to private firms that issue GSS bonds in order to increase the volume of these bonds, and increase the funding of renewable, social, or SDG targeted projects. The rationale behind this is that one of the biggest impediments to growth of green bond prominence is under-supply (Barua and Chiesa, 2019); accordingly supply-side policies need like tax-cuts and subsidies need to be introduced to make green bond issuance a more rational choice than funding through traditional debt sources or funding via equity. Not only does this fit within economic theory, a study conducted by the Asian Development Bank Institute conducted a study on determinants of green bond issuance in 58 economies that found policies such as "green bond grants and tax incentives, have a positive and significant effect on green bond issuance in the private sector" (Azhgaliyeva and Kapsalyamova, 2021).

With regards to supranational organizations, the International Monetary Fund should begin to include GSS market existence as a factor to be taken into consideration when loans are requested by member states. IMF loans are paid out in installments, and they are conditional by nature, these conditions fall into four categories: prior action, quantitative performance criteria, indicative targets, and structural benchmarks, the last of which includes the financial sector (IMF Conditionality Factsheet, 2023). If GSS

markets or a stock market with ESG ratings become required for superior interest rates many countries may be motivated to move towards green finance, which would be better for the resilience of the economy in question (Zadek and Flynn, 2013) and by extension allow for swifter repayments and lower risks of defaulting on the loans in question.

Furthermore, supranational organizations should set up policy frameworks that advise emerging and developing economies on setting up, regulating, and monitoring GSS markets both for the direct benefits reaped (increased GDP, improved environmental quality), and the indirect (increased investment, creation of new jobs, etc). Accordingly, the need for documentation, best practices, benchmarks and other policy frameworks may allow for the transmission of the necessary know-how to states willing but presently unable to make the shift towards greener economies.

6. CONCLUDING REMARKS

This paper proposes green finance as a key determinant in improving economic prosperity and potentially creating social change. Taken together, the empirical results imply that issuance of GSS bonds is a key determinant of the sustainable development pillars.

This study sheds new lights and provides some insightful implications for corporate financial managers in firms with financial constraints and suffer from financial slack and investment gap. Firms with business models based on eco-innovation, renewable energy, or electric vehicles that require high capital endowments and struggle to obtain the necessary funds using traditional financing may benefit from the issuance of green bonds (Sachs *et al.*, 2019).

Furthermore, this study has important practical implications for policy makers in different countries as well as supranational organizations such as the United Nations, the World Bank Group, and the International Monetary Fund (IMF). In particular, global financial markets should be well regulated, developed and have more deep markets to be able to support trading on sustainable financial instruments. Furthermore, the private sector should be encouraged to issue green bonds using tax breaks (tax-cuts) or subsidies to increase the funding of renewable, social, or SDG targeted projects (Azhgaliyeva and Kapsalyamova, 2021).

Moreover, IMF should consider the development of GSS bond market when granting loans to their member states. The growth of GSS markets and ESG equities will encourage many countries to support the issuance of green bonds with superior interest rates, thus, economies will be more resilient (Zadek and Flynn, 2013). The advisory role of the supranational organizations should be strengthened to support the emerging and

developing economies in setting up policy frameworks, regulating and monitoring the GSS bond markets to reap direct benefits from increased GDP, improved environmental quality, and indirect benefits from increased investment, and creation of new jobs.

Note

1. Calculated by multiplying Real GDP by the Gini coefficient to account for income distribution.

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