



Sustainable Development Financing Models in the BRICS Countries

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Abstract. The BRICS countries, as emerging economies, can share their experience in financing sustainable development for many developing countries. Active promotion of sustainable development finance has a mutually reinforcing effect on national economies. By assessing the financing index, it is possible to identify the shortcomings in the process of achieving the SDGs, which countries continuously correct in the development process, and then accelerate the process of realizing the SDGs. The aim of this article is to calculate the World Bank's publicly available data to assess the impact of sustainable development financing on a country's sustainable development. The calculation of the Sustainable Development Index (SDI) was carried out for the BRICS countries for the period 2013-2022. The results show that the sustainable development of BRICS countries focuses on different aspects, that the realization of the sustainable development of the country requires lasting reference and learning from the experiences of other countries, and that there is a positive impact of sustainable development financing on the sustainable development of the country.

Keywords: Sustainable Development Financing Index, index method, financing models, BRICS, Assessment methods

1 INTRODUCTION

The Sustainable Development Goals (SDGs) determine the direction of a country's long-term development. The BRICS countries will receive greater attention because of their special characteristics and developments. The BRICS countries all have their own distinct strengths, and therefore there is a strong complementarity in the process of cooperation, which achieves the effect of complementing each other's strengths. However, differences (existing legislation and policies, level of socio-economic development, cultural phenomena, geographical location) make it impossible to use uniform criteria for assessing the sustainable development of enterprises or even countries.

The question of the current study is whether sustainable development financing has a positive impact on sustainable development in the BRICS countries. The aim of this article is to assess the BRICS Sustainable Development Index using harmonized criteria and to analyze the focus of sustainable development in the BRICS countries. The object

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of the study is publicly available data on sustainable development in the BRICS countries.

However, the current study has some limitations. There are many factors affecting the sustainability of countries, and there are differences in subjective and objective perceptions. The publicly available data only summarize the factors that can be expressed numerically, and the study period covers the period 2013-2022, as the data for 2023 have not yet been updated.

2 THEORETICAL BACKGROUND

How to maximize sustainability with sustainable development financing is always a question for worthy companies and countries to think about. For achieving the SDGs, each country must find possible investment sources for sustainable development implementation and maintenance [3]. Naim and Begum (2018) [5] discussed the idea that the banking sector can contribute to sustainable development. The authors state that one such element is the financial institutions' role in sustainability issues by empowering different economic activities, such as business expansion, national output, ensuring a sustainable investment environment, and more. In addition, they note that the banking sector could make a profound contribution to the development of the country by adding extra value to Gross Domestic Product, Gross National Product, and other metrics of economic output that can directly influence the development of a country [5]. Lentjushenkova et al. (2019) claim that intellectual capital could be a driver of sustainability [4]. Jomo et al. (2016) [2] stated that Public-Private Partnerships (PPPs) could be treated as a tool for sustainable development promotion.

The sustainable development financing model includes three areas: green bonds, blended finance and impact investing.

A sustainable development financing model can effectively influence a country's development. The overall assessment of sustainable financing includes both financial and non-financial data, which are mainly reflected in the company's financial statements and the country's economic growth data. Non-financial data mainly reflect environmental (E), social (S) and governance (G) aspects. Currently, the BRICS countries have issued relevant disclosure standards and guidelines for non-financial reporting of domestic enterprises, and there are many international organizations that assess the sustainability of companies from an objective and comprehensive perspective. Rating agencies include MSCI [8], Sustainalytics, FTSE Russell [8], GRI, SASB, ISO, have long developed standards that are benchmarks for the development of ESG data in different countries [1]. Whether it is a company or a country, it is important to assess the sustainability aspect. The assessment of financial sustainability can reflect the long-term development potential of a company or country and is also crucial for investment and financial decisions.

Model financial analyses from any of the assessment agencies can be used to assess sustainability, and different assessment agencies assign ratings to non-financial statements in different ways. These include scores of 0-100, 0-40, 0-5, and ratings of AAA-

CCC, AAA-D, etc [8]. The calculations used in the rating process also vary: some agencies use the average weight of the three ESG dimensions, some prefer to use a down scoring system when selecting negative information, and others assign different proportions of the three ESG dimensions when calculating the weight of positive reporting. When such models are used to analyze the sustainability of a company or country, the results obtained will fall within a common range, or it is possible to obtain completely different ranking results by choosing different methods. There are already possible anomalous results that can arise when companies use these methods.

3 METHODOLOGY

This article will analyze the calculation of financial models for the financial situation of sustainable development in BRICS countries, compared with enterprises, the publication of financial and non-financial data in BRICS countries cannot be unified, so when using non-financial reporting, the evaluation model of financial institutions will exist in the data system is very large, the type of information cannot be unified, and there is also a certain degree of subjectivity in this kind of evaluation model, and these factors do not allow the results of the evaluation model to be evaluated. Therefore, in assessing the financing of sustainable development of BRICS countries, we use the mathematical model of index method to calculate and analyze four aspects of BRICS countries: economic, environmental, social and governance.

Using the index methodology [6] to assess sustainable development finance in BRICS countries requires that the type of information to be assessed must first be determined. As shown in Table 1, the basic information data are ESG themes in publicly available World Bank data [7]. Information that is not specific in the public data and that is inconsistent or duplicative in the assessment is removed to produce the types of indicators categorized in the four sections above.

Table 1. - Indicators for assessing sustainable development of the region

No	Sustainable Development Indicators Block	Name of indicators used
1	Economic	GDP growth (annual %) (1.1)
		Gini index (1.2)
		Food production index (2014-2016 = 100) (1.3)
		Food production index (2014-2016 = 100) (1.4)
		Total external debt volume (DOD, current \$) (1.5)
2	Environmental	Agricultural land (% of land area) (2.1)
		Adjusted savings: natural resources depletion (% of GNI) (2.2)
		Agriculture, forestry, and fishing, value added (% of GDP) (2.3)
		Forest area (% of land area) (2.4)
		Renewable energy consumption (% of total final energy consumption) (2.5)
		CO2 emissions (metric tons per capita) (2.6)
3	Social	Income share held by lowest 20% (3.1)
		Life expectancy at birth, total (years) (3.2)

		Proportion of seats held by women in national parliaments (%) (3.3)
		School enrollment, primary and secondary (gross), gender parity index (GPI) (3.4)
		Patent applications, residents (3.5)
		Government expenditure on education, total (% of government expenditure) (3.6)
		Labor force participation rate, total (% of total population ages 15-64) (modeled ILO estimate) (3.7)
		Unemployment, total (% of total labor force) (modeled ILO estimate) (3.8)
4	governance	Government Effectiveness: Estimate (4.1)
		Regulatory Quality: Estimate (4.2)
		Political Stability and Absence of Violence/Terrorism: Estimate (4.3)
		Rule of Law: Estimate (4.4)

*Table compiled by the author

The indicators in Table 1 were separated into positive and negative impacts to produce the results presented in Table 2. The Excel spreadsheet of the original data had little or no data for 2023, so data for the decade 2013-2022 was chosen for the calculations.

Table 2. - Groups of indicators according to their impact on sustainable development

Group of indicators	Indicator codes with a positive impact	Indicator codes with negative impact
Economic	1.1,1.2,1.3,1.4	1.5
Environmental	2.1,2.2,2.3,2.4	2.5
Social	3.1,3.2,3.3,3.4,3.5,3.6	3.7,3.8
governance	4.1	4.2,4.3,4.4

*Table compiled by the author

In the second stage, the indicators were put into index form using the following formulas:

$$I_{i\ pos} = 1 - \frac{(X_i - X_{min})}{(X_{max} - X_{min})} \quad (1)$$

$$I_{i\ neg} = 1 - \frac{(X_i - X_{min})}{(X_{max} - X_{min})} \quad (2)$$

Where:

I_i - index value

X_i - value of the index in a certain period

X_{min} - minimum value of the index for the whole time under study

X_{max} - maximum value of the index for the whole time under study

At the third stage, the indices were calculated for the formed subgroups using the formula:

$$Y_{eco,env,soc,gov} = \frac{\sum^n I_{i(pos,neg)}}{(n)} \quad (3)$$

Where:

Y - the value of the subgroup index

n - the number of analyzed subgroup indices

At the fourth stage, the generalized index of sustainable development of the region was calculated using the formula:

$$Y_{SD} = \sqrt[4]{Y_{eco}Y_{env}Y_{soc}Y_{gov}} \tag{4}$$

Where:

Y_{SD} - the index of sustainable development of the region.

4 RESULTS AND DISCUSSION

The index method was used to calculate the indicators, and the final results were obtained as shown in Figure I. The comparison of the BRICS countries shows that Russia fluctuates strongly in two of the four dimensions, but the overall sustainability index until 2021 will be consistently higher than the other countries. China's sustainability index is at the middle level among the golden diamond countries. Iran's index rose rapidly until 2017 but has gradually declined in recent years and tends to level off. Saudi Arabia is the opposite of Iran, showing a steady upward trend after 2017. India's index has consistently shown an upward trend between 2013 and 2022, with India's governance and economic indices rising 90% and 59% respectively. Egypt and UAE have also shown a steady upward trend in their sustainability indices.

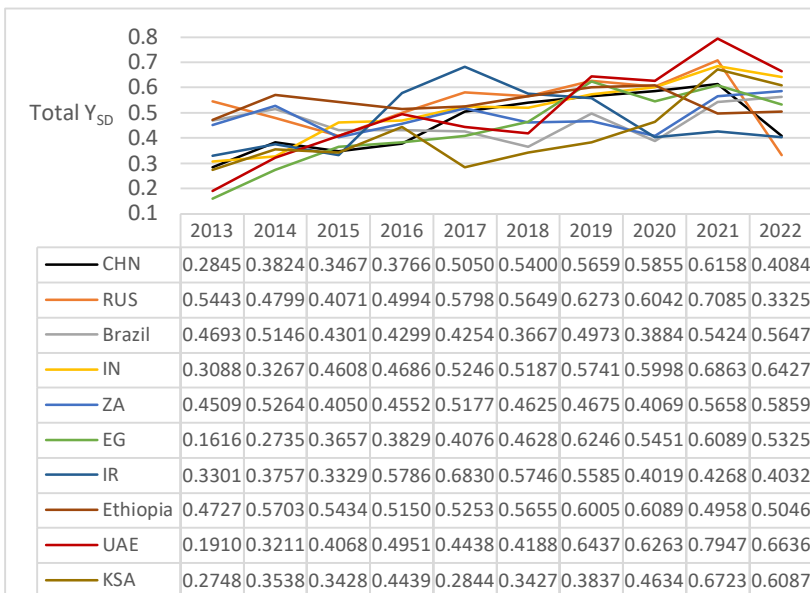


Fig. 1. - Results of the BRICS Sustainable Development Assessment 2013-2022.

The analysis results from the four dimensions show an upward trend in the overall sustainable development index. The calculations show that China's economic development index reaches a maximum value of 0.9 in 2021, and then rapidly declines by 50% in 2022. The environmental development index first shows a declining trend during these 10 years, then rises again, reaching a maximum value in 2020, followed by a continuous decline of two years. The social development index is a dimension with relatively flat growth. The economic and governance dimensions are more volatile. Russia's sustainable development profile is generally stable, with the trend line showing a slight upward trend. The Environmental Index shows the fastest growth between 2013 and 2022 and is consistently positive. The Governance Index declines rapidly after 2019, falling by a total of 38% between now and 2022. The economic index shows a downward trend followed by an upward trend, although the environmental and governance indices are more volatile. Social development, however, is relatively stable and shows a slight upward trend. The BRICS countries show an increasing trend in the sustainability index, and all economic indices are growing at different rates. China's economy is growing rapidly, but its environmental index is declining, suggesting that environmental regulation and management is not as effective as it should be. The UAE and Arabia are the best performing countries in terms of governance, and their financial situation in terms of sustainable development is gradually improving.

Assessing the financing of a country's sustainable development through financial modelling requires a huge amount of basic data, and the more detailed the data, the more convincing the results. The assessment process considers dimensions such as a country's economy, environment, society and governance, which are of practical importance to investors in various fields when assessing financial risks. If all four dimensions are positive, the country is attractive to investors and has a positive impact on the economic development of the country. The impact of sustainable development finance on a country's economy according to different dimensions is as follows:

1) Economic growth and diversification: promoting a green economy and reducing dependence on fossil fuels. Increasing the number of green projects creates greater access to opportunities and promotes economic diversification.

2) Environment and resource management: the most visible evaluation indicator in the transition to sustainable development is environmental monitoring data. Various sustainable development finance projects promote sustainable resource use in the environmental industry, agriculture and other sectors, and protect ecosystem health.

3) Financial market and investment environment: Sustainable development projects usually have long-term revenue potential, which can attract long-term investors. By investing in sustainable development projects, financial markets can simultaneously mitigate risks associated with climate change, resource depletion and social instability.

(4) Technological innovation and progress: sustainable development projects typically require the development of new technologies such as renewable energy applications, carbon emission reductions, etc., which stimulates the development and application of technology.

(5) Social and political regulation: Sustainable finance promotes the development of green projects and improves the quality of life of people. It guides the development and

implementation of relevant national policies and contributes to the transformation of the economy towards sustainable development. It also promotes international co-operation, such as the Green Climate Fund.

5 CONCLUSION

In terms of the three non-financial dimensions - environment, society and governance - most countries can only achieve stable growth in 1 or 2 of these dimensions. To achieve the two-carbon goal, most BRICS countries have adopted the environmental dimension as a sustainable development strategy, and more attention should be paid to the balance of the three dimensions in the transition to sustainable development. The evaluation of sustainable development financing through financial modeling method has validity, and the evaluation results can more clearly reflect the aspects that are insufficient in the development process. The evaluation results in the thesis show the strengths and weaknesses of BRICS countries in financing sustainable development. In the evaluation process, it is found that the financial model can be applied not only to evaluate the national sustainable development financing, but also to analyze and evaluate the effect and process of sustainable development financing of enterprises or projects, and then adjust the transformation strategy according to the actual situation in a timely manner. The impact of sustainable development financing on the development of national economy is mainly reflected in ecology, optimal resource allocation, social stability, political regulation, It contributes to the diversification of national economies.

REFERENCES.

1. Dreving S.R., Khrustova L.E. (2018) Non-financial factors of value formation in the system of financial control of holding company development strategy // *Finance: theory and practice.*, 6: 53-68. <https://cyberleninka.ru/article/n/nefinansovye-factory-formirovaniya-stoimosti-v-sisteme-finansovogo-kontrolya-strategii-razvitiya-holdinga>
2. Jomo, K.S.; Platz, D.; Sharma, K.; Chowdhury, A. Public-Private Partnerships and the 2030 Agenda for Sustainable Development. *Dep. Econ. Soc. Aff. Work. Pap.* 2016, 43, 998–1005. [Google Scholar]
3. Lapinskaite, I., Skvarciany, V., & Janulevicius, P. (2020). Impact of investment sources for sustainability on a country's sustainable development: evidence from the EU. *Sustainability*, 12(6), 2421. [Google Scholar]
4. Lentjušenkova, O.; Zarina, V.; Titko, J. Disclosure of intellectual capital in financial reports: Case of Latvia. *Oeconomia Copernic.* 2019, 10, 341–357. [Google Scholar] [CrossRef]
5. Naim, M.J.; Begum, K. Role of Banking in Sustainable Financing: Case of Bangladesh. *Milenn. Univ. J.* 2018, 3, 33–39. [Google Scholar]
6. Nikolaevich B.S. (2023) Model of assessment of sustainable development of the region on the basis of index method // *Economy of the region.*, 19(1): 45-59. <https://cyberleninka.ru/article/n/model-otsenki-ustoychivogo-razvitiya-regiona-na-osnove-indeksnogo-metoda>.
7. World Bank // ESG Statistics/ URL: <https://esgdata.worldbank.org/> (date of reference: 12.05.2024).

8. Yangyang Li. (2023). A strategy for building an ESG rating system with Chinese characteristics. *Finance*, 13, 240. [Google Scholar][CrossRef]

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