*Research Article*

# Evaluation of Foreign Direct Investment Attractiveness of BRICS-T Countries: The CRITIC-LOPCOW Based ARAS Approach

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**Abstract:** Foreign direct investments (FDIs) are of significant importance not only for multinational corporations (MNCs) but also for the development of the countries receiving these investments. Many countries, especially developing countries, are making efforts to attract more FDIs. This study focuses on BRICS-T (Brazil, Russia, India, China, South Africa, and Türkiye) countries, which play an important role in the global development landscape. The primary objective of this study is to assess the FDI attractiveness of BRICS-T countries for the period 2019-2023 through the application of multi-criteria decision-making methods (MCDM). In this study, CRITIC, LOPCOW and common weighting methods were used for criteria weighting. The study revealed that the corruption perception index (CPI), economic freedom index (EFI) and inflation rate were important in the criterion weights, while electricity production and gross domestic product (GDP) had low weights. Furthermore, an examination of the integrated performance results of all criteria weighting methods and the ARAS method reveals that China, India, and Türkiye stand out among the BRICS-T countries in terms of FDI attractiveness. Conversely, Brazil, Russia, and South Africa are identified as countries with the lowest FDI attractiveness. In general, Türkiye's FDI attractiveness has increased over the years, while Russia's FDI attractiveness has decreased.

**Keywords:** FDI, MCDM, BRICS countries, Türkiye, MNCs
**Jel Codes:** F14, F21, F23

## *BRICS-T Ülkelerinin Doğrudan Yabancı Yatırım Çekiciliğinin Değerlendirilmesi: CRITIC-LOPCOW Tabanlı ARAS Yaklaşımı*

**Öz:** Doğrudan yabancı yatırımlar (DYY'ler), çok uluslu şirketler (ÇUŞ'lar) için önemli olduğu kadar, bu yatırımları alan ülkelerin gelişmesinde önemli bir rol oynamaktadır. Başta gelişmekte olan ülkeler olmak üzere birçok ülke, ülkelerine daha fazla DYY çekmek için çaba göstermektedir. Bu çalışmada gelişmekte olan ülkeler arasında dünyada önemli bir yere sahip olan BRICS-T (Brezilya, Rusya, Hindistan, Çin, Güney Afrika ve Türkiye) ülkelerine yer verilmiştir. Çalışmanın temel amacı, 2019-2023 dönemi için BRICS-T ülkelerinin DYY çekiciliğini çok kriterli karar verme yöntemleri (ÇKKV) ile değerlendirmektir. ÇKKV yöntemlerinin bütünleşik olarak ele alındığı çalışmada, kriter ağırlıklandırma için CRITIC, LOPCOW ve ortak ağırlıklandırma yöntemleri kullanılmıştır. Performans sonuçlarına ulaşmak için ARAS yöntemine yer verilmiştir. Çalışmada, genel itibariyle kriter ağırlıklandırmada yolsuzluk algılama endeksi ve ekonomik özgürlük endeksi ve enflasyon oranı öne çıkarken, elektrik üretimi ve gayri safi yurtiçi hasıla (GSYİH) değişkenlerinin kriter ağırlığı düşük olmuştur. Bunun ötesinde bütün kriter ağırlıklandırma yöntemleri ile ARAS yönteminin bütünleşik performans sonuçlarına göre DYY çekiciliğinde BRICS-T ülkeleri arasında Çin, Hindistan ve Türkiye öne çıkmıştır. Buna karşın, Brezilya, Rusya ve Güney Afrika, DYY çekiciliğinin en düşük olduğu ülkeler arasında yer almıştır. Genel olarak yıllar içinde Türkiye'nin DYY çekiciliği artarken, Rusya'nın DYY çekiciliğinde düşüş olmuştur.

**Anahtar Kelimeler:** DYY, ÇKKV, BRICS ülkeleri, Türkiye, ÇUŞ'lar
**Jel Kodları:** F14, F21, F23

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## 1. Introduction

Foreign direct investment (FDI) is defined as the investment by a company or organization operating in one country in a company or organization in another country (Gülbay Yiğiteli, 2024, p. 669; Hintošová, 2021, p. 1026; Nguyen et al., 2023, p. 1; Zhang, 2022, pp. 1056-1057). Such investments are typically made by multinational corporations (MNCs) and are made on a long-term basis. FDI is of significant importance for MNCs and the countries receiving these investments. By allocating capital across multiple nations, MNCs can enhance their competitive edge and capitalize on the prospects offered by the investing countries. Conversely, countries that attract FDI can enhance their own competitiveness through access to new technologies, increased exports, and job creation (Činčikaitė and Meidute-Kavaliauskiene, 2023, p. 63; Mitsi, 2023, p. 106). Furthermore, countries encourage FDI to increase production, expand foreign exchange reserves, and establish a competitive environment within the national economy (Koçtürk and Eker, 2012, p. 41). Consequently, FDI offers substantial opportunities for both MNCs and the host countries in which they operate. In this regard, MNCs seek new markets for increased FDI. In response, host countries implement a series of policies, including tax reductions and subsidies, with the aim of attracting FDI inflows. These policies are often accompanied by practices aimed at improving and liberalizing the business environment (Şit, 2023, p. 428). In this way, many countries compete in attracting FDI. In this competition, developing countries have a significant opportunity to contribute, as they aim to bridge the gap with economically developed economies. FDI is frequently recognized as a key instrument to achieve this objective (Ghazalian and Amponsem, 2019, p. 1111).

The contemporary trend in developing countries reveals an escalating rate of investment. Historically, FDI inflows were predominantly sourced from developed countries. However, there has been a notable shift in this trend, with a substantial increase in FDI inflows to developing countries, particularly since 2020 (UNCTADstad, 2024). BRICS-T countries, in particular, have assumed a prominent role among developing countries. This is primarily due to the fact that BRICS-T countries are widely regarded as the most developed among developing countries (Nistor, 2015, p. 981). In 2023, the BRICS-T countries accounted for more than 21% of the total world FDI inflows and exports (UNCTADstad, 2024). They are among the countries receiving the most investment in the world (Öztürkçü and Yıldız, 2020, p. 207). Notably, China has emerged as the second largest recipient of FDI, trailing only the United States (USA). Brazil has also demonstrated notable receipt of FDI investments on a global scale.

MNCs are responsible for the decision-making process regarding FDI, while the decision-making bodies of the receiving countries consider a multitude of criteria to attract additional FDI. According to extant literature on the subject, numerous criteria affect FDI. In this study, the criteria for which the most recent data are available are taken into consideration. In accordance with the extant literature, the criteria include trade openness, inflation, economic freedom, perception of corruption, electricity production, market size, GDP growth rate, population, inward FDI, corporate tax, and labor force.

The BRICS-T countries are the most important countries for FDI inflows among developing countries. FDI inflows to these countries are very important for both BRICS-T countries and MNCs. The main motivation of this study is to investigate what countries can do to increase their FDI attractiveness according to selected criteria and which countries MNCs may prefer according to these criteria. Despite the numerous studies on FDI inflows to BRICS-T countries in the extant literature, no study has been encountered that employs multi-criteria decision making (MCDM) methods. This study attempts to fill this gap. Accordingly, criteria were selected by taking into account the previous studies and the following two research questions were formulated:

Research Question 1: What are the priorities among the selected criteria in attracting FDI in BRICS-T countries?

Research Question 2: What is the performance ranking of BRICS-T countries in FDI attraction?

Within the scope of these two research questions, the main objective of the study is to evaluate the FDI attractiveness of BRICS-T countries for the period 2019-2023 with MCDM methods. The study employs CRITIC, LOPCOW, and common weighting methods for criterion weighting, with MCDM methods being regarded as integrated. The ARAS method is employed to ascertain the FDI attractiveness performance outcomes of the countries. It is anticipated that this study will contribute to the existing body of knowledge in this field.

## 2. Literature review

There are many studies on FDI investments in BRICS countries. In this study, a summary of the literature on FDI investments in BRICS countries and Türkiye is presented. Wei (2005) conducted a panel data analysis for the period 1987-2000, focusing on several key variables. These included relative real GDP, real export from China, real import to China, relative real wage, relative real borrowing cost, relative real exchange rate, relative country risk, cultural difference, geographic distance, and annual signed investment treaties. The study indicated that China attracts much more FDI than OECD countries because of its large domestic market and high level of trade relations with these countries. India, on the other hand, has advantages such as cheap labor costs, lower country risk, geographical location and cultural similarities with OECD countries in terms of attracting FDI. Karagöz (2007) conducted a time series analysis for the determinants of FDI in Türkiye for the period 1970-2005. The following variables were considered in the study: FDI, GDP, inflation, trade openness, exchange rate, number of high school graduates, and number of companies opened. There was a significant relationship between FDI inflows to Türkiye and trade openness. Kar and Tatlısöz (2008) employed the least squares method for the variables labor cost, GDP, number of days lost in strike, openness, corporate tax, real exchange rate, international net reserves, investment incentives, and electricity production for the period 1980-2003. The study identified several factors that positively influence FDI in Türkiye, including international net reserves, GDP, trade openness, investment incentives, and electricity production. Conversely, the variables that negatively affect FDI are the real exchange rate and labor costs. Zheng's (2009) study examined a comprehensive set of factors affecting FDI between 1984 and 2002. These factors included market size, market growth, labor cost, export and import trends, exchange rates, inflation, borrowing costs, country and political risk, geographical distance, and cultural differences. The analysis utilized advanced econometric techniques, such as pooled ordinary least squares (POLS) and random effects models, to assess the impact of these variables on FDI patterns. An analysis of the factors affecting foreign direct investment in China and India was provided. The study found that market growth, imports, labor costs, and country political risk/policy liberalization are common determinants of FDI in both countries. In the case of China, exports, market size, and borrowing costs were also significant. Conversely, geographical and cultural distance emerged as crucial factors influencing FDI decisions in India. Vijayakumar et al. (2010) employed a panel data analysis of key economic indicators for BRICS countries, including FDI, GDP, industrial production index, labor cost, infrastructure index, trade openness, real effective exchange rate, and gross capital formation, for the period 1975-2007. According to this study, market size, labor cost, infrastructure, currency value and gross capital formation were found to be potential determinants of FDI inflows in BRICS countries. Kaur and Sharma (2013) conducted econometric analyses for FDI, exchange rate, real GDP, inflation, external indebtedness, openness and foreign exchange reserves for the periods 1990-1991 and 2010-2011. Regression analysis and Augmented Dickey-Fuller test were used in the study. There was a positive relationship between FDI inflows to India and trade openness, foreign exchange reserves, GDP and long-term debt. Conversely, there was a negative relationship between inflation, exchange rates, and FDI

inflows. Elfakhani and Mackie (2015) performed a study on the determinants of FDI in BRICS countries for the period 1980-2008 using multiple regression analysis. The study's comprehensive set of variables included net inwards FDI, GDP, GDP growth rate, investment climate, level of education, inflation, literacy rate, electricity consumption per capita, life expectancy at birth, population, people's receptivity to foreign investors, democracy index, openness, international property right perception index, CPI, and civil liberty level. This study found that social and political variables were not significant, while economic variables such as GDP, trade balance, currency risk, and debt risk were more important. Gupta and Singh (2016) conducted a comprehensive analysis of the determinants of FDI in BRICS countries during the period from 1983 to 2013. Utilizing a range of analytical methods, including OLS, fixed effects, and random effects, the study encompassed a diverse set of economic indicators. These included FDI, market size and growth, industrial production index, inflation, unemployment, trade openness, exchange rate, gross capital formation, international liquidity, and labor cost variables. This study revealed that FDI is influenced by the industrial production index, inflation rates, trade openness, exchange rates, unemployment rates, and labor costs. Shah and Ali (2016) analyzed the variables of market size, human capital, trade openness, macroeconomic stability, infrastructure level and WTO accession for BRICS countries for the period 1990-2011 with random effect panel estimation technique. Market size, trade openness, economic growth rate, macroeconomic stability and infrastructure availability were identified as critical variables affecting FDI in BRICS countries. Asongu et al. (2018) conducted a pooled time-series cross-sectional analysis of GDP, inflation, infrastructure availability, trade openness, natural resources, and quality of institutions for the period 2001-2011. The findings of the study indicated that market size, infrastructure availability, and trade openness are the most substantial factors in attracting FDI to BRICS and MINT (Mexico, Indonesia, Nigeria, and Türkiye) countries. On the other hand, the availability of natural resources and the quality of institutions has a very small impact. Gurshev (2019) analyzed the determinants of FDI (inflow), GDP, market price of Brent oil, real exchange rate, index of economic openness to trade investment, economic sanctions, corporate tax and labor productivity with Autoregressive integrated moving average (ARIMA) regression model for the period 1996-2017. Market size and tax rate are found to have a positive effect on FDI inflows to Russia. In contrast, the ratio of trade barriers and sanctions exhibited a negative impact on FDI inflows to Russia. Maryam and Mittal (2020) analyzed GDP, electricity consumption, gross capital formation, trade openness and real effective exchange rate variables of BRICS countries for the period 1994-2018. The Pooled Mean Group (PMG) Auto-Regressive Distributive Lag (ARDL) method was employed for the analysis. They found that GDP, trade openness, exchange rates, gross capital formation, and infrastructure availability all play a role in long-term FDI. This study further determined that China is particularly prominent in terms of FDI among the BRICS countries. Batmaz and Yürük's (2023) study involved an analysis of FDI (inflow), GDP, inflation, and labor force data from 1990 to 2020. Utilizing the ARDL Boundary Test, they examined the determinants of FDI in Türkiye. GDP per capita has a positive effect on FDI inflows to Türkiye, while high inflation has a negative effect. Beşoluk and Keskin (2023) conducted a Hacker and Hatemi-J Causality Analysis on the factors affecting FDI inflows to Türkiye for the period 1996-2020. The variables of the study are FDI in GDP, corruption index, rule of law index, political stability index, economic growth, inflation, openness, minimum wage (gross), corporate tax, real exchange rate, number of days lost in strike. Their study revealed a causality relationship between FDI and several economic factors, including openness, corporate tax, real exchange rate, inflation, and economic growth. Mitsi (2023) investigated the determinants of FDI in developing countries for the period 1996-2018. This study employed the Random Effects Model and the Two Stage Least Squares Method to analyze key variables such as property rights, government integrity, tax burden, government spending, business, monetary, trade, investment, and financial freedom. It was concluded that monetary, trade and financial freedom positively affect

FDI inflows in developing countries. Cutcu and Keser's (2024) study employed a panel data analysis approach, focusing on key variables such as FDI, democracy, GDP, and inflation. This analysis was conducted for the period 1994- 2018. The impact of the level of democracy on FDI in BRICS-TM countries (Türkiye and Mexico) was analyzed. It is found that the development of democracy in these countries will positively affect FDI inflows when supported by economic variables. Upadhyaya and Barreto de Góes (2024) conducted a time series analysis on the determinants of FDI in Brazil for the period 1995-2022. This study encompassed a comprehensive analysis of FDI, GDP, current account balance, real exchange rate, trade openness, and economic freedom index (EFI) variables. GDP, current account balance and EFI were found to significantly affect FDI inflows to Brazil.

Although there are many such studies on FDI inflows to BRICS-T countries, there are no studies using MCDM methods. Although studies on FDI inflows and attractiveness of developed and developing countries and cities using MCDM methods are limited, they are increasing rapidly. Çalık et al. (2019) examined Türkiye's FDI performance by focusing on economic, political, and country factors as well as different sectors. The study employed the AHP and TOPSIS methods. The study revealed that, while the political criterion was identified as the most significant, the manufacturing sector emerged as the most preferred. Altuntaş and Gök (2020) analyzed the FDI performance of countries using the TOPSIS and COPRAS methods for 2019. Among the 12 countries included in the study, the USA and the UK demonstrated the highest performance. Türkiye ranked third according to COPRAS and fourth according to TOPSIS. Altıntaş (2021) evaluated the FDI performance of G7 countries for 2019. In the study, the MULTIMOORA method was employed to assess uncertainty and macroeconomic stability, public administration, financial structure and development, business environment, market accessibility and potential human and natural resources, cost components, logistics performance, telecommunications and ICT, agglomeration economies, innovation and diversity criteria. The United Kingdom, the USA, and Germany demonstrated high performance, while Japan, Canada, and Italy exhibited low performance. Benli et al. (2022) conducted a study on government performance in relation to FDI performance. In the dataset including many countries, the average of the 1996-2000 period was taken into account. Entropy and TOPSIS methods were employed to assess corruption, government effectiveness, political stability, and the absence of violence/terrorism, regulatory, quality, rule of law, voice, and accountability criteria. The study identified promotion of voice and accountability, corruption control, and regulatory quality as the predominant criteria in governance performance. The study's findings indicate that Finland, Denmark, and New Zealand exhibit the highest levels of governance performance. Conversely, the countries with the lowest performance ratings were Myanmar, Zimbabwe, and Eritrea. Gupta et al. (2022) evaluated the priority sectors for FDI inflows to India based on economic, political, social, and country factors for 2020 using AHP and WASPAS methods. In the study which five sectors were considered, the information technology sector was the priority sector in FDI investments. Other prominent sectors were retailing and e-commerce and healthcare. According to Činčikaitė and Meidute-Kavaliauskiene (2023), the FDI attractiveness of the Baltic countries was evaluated for the period 2010–2020. The AHP and TOPSIS methods were employed. The criteria encompassed population, market size, GDP per capita, unemployment, education, energy consumption, transportation infrastructure, communication infrastructure, ease of doing business, FDI inflows, trade openness, inflation factor, bribery and corruption, political stability, property rights, regulatory quality, government effectiveness, rule of law, income tax rates, R&D costs, and labor costs. The findings indicated that the state of Estonia was the most successful in attracting FDI, with Lithuania and Latvia ranking second and third, respectively. İnam and Murat (2023) used the COPRAS method to analyze the FDI performance of 13 countries in the G20 for 2020. In the study, the following criteria were utilized: FDI, population, corruption index, inflation, trade openness, economic growth, effective marginal tax rate, electricity

production, labor force, and business freedom index. China, the USA and India were the countries with the highest performance. Marchewka's (2023) analysis examined the FDI performance of Polish cities in 2021. The study employed the Multi-Criteria Vector Measure Construction method, a sophisticated analytical approach that considers a multitude of investment variables. According to the study, the cities in Poland are categorized into three classes. However, FDI performance produced similar results for numerous cities. Nguyen et al. (2023) used Fuzzy-Delphi, Fuzzy-DEMATEL, and DANP methods to identify the criteria that are important in attracting FDI to Vietnam. The study encompassed a range of factors, including tax rates, the efficiency of legal and regulatory processes, and the transparency of government regulations. The research identified tax rates and the ease of paying taxes, labor cost, geographical location, transparency of government regulations and corruption lack, strength of investor and property rights, and government incentives for investors as the primary criteria. Le and Dang (2024) ranked the FDI performance of provinces in Vietnam for the period 2012-2020. In the study, the criteria of labor force, GDP, the provincial competitiveness index, cumulative FDI capital and cumulative FDI projects are analyzed by data envelopment analysis. The analysis revealed that Vung Tau, Binh Duong, Ho Chi Minh, and Ha Tinh emerged as the leading cities in terms of FDI attractiveness. Wanke et al. (2024) conducted an analysis of the socio-economic characteristics of countries in the context of FDI performance criteria, employing the TOPSIS, VIKOR, COPRAS, and RoCo methods. In this context, GDP, human development index, population, rural population, inflation, mortality rate, female population, life expectancy, and unemployment rate criteria were used. The study found that high GDP per capita, low infant mortality rate, and high life expectancy increase FDI performance.

## 3. Data and methods

### 3.1. Data

The present study utilizes data from 2019 to 2023 to assess the FDI attractiveness performance of BRICS countries and Türkiye. The criteria for the attractiveness of FDI have been developed in accordance with the literature. However, the lack of sufficient data for some of the criteria in the literature (for example, the latest data year for the ease of doing business index is 2020 and for the logistics performance index, data is only available for 2023) led to the narrowing of the criteria. Table 1 provides details on the criteria.

**Table 1.** List of Criteria

| Criteria | Definition | Reference Data | Reference Study | Direction |
|---|---|---|---|---|
| Inward FDI (Million US Dollars) (C1) | It represents the annual inward FDI inflows, excluding stocks, expressed in millions of U.S. dollars. | UNCTADstat (2024) | Činčikaitė and Meidute-Kavaliauskiene (2023), Demir et al. (2021), İnam and Murat (2023), Saini and Singhania (2018), Rachdi et al. (2016) | Max |
| Population (Thousand People) (C2) | In the context of countries, the absolute value represents the total population in thousands per year. | World Bank Group (2024a) | Činčikaitė and Meidute-Kavaliauskiene (2023), İnam and Murat (2023) | Max |
| Market Size (Million US Dollars) (C3) | The calculation of market size is based on the GDP. GDP is the sum of the gross value added by all producers in the economy, including product taxes and excluding subsidies. | World Bank Group (2024b) | Činčikaitė and Meidute-Kavaliauskiene (2023), Faruq (2023), Gurshev (2019), Sahiti et al. (2018), Zheng (2009) | Max |
| Economic Growth (%) (C4) | The calculation of economic growth is based on the growth rate of the GDP. GDP growth rate is the annual percentage change in GDP. | World Bank Group (2024c) | Rachdi et al. (2016), Saini and Singhania (2018), Suryanta and Patunru (2022), Zheng (2009) | Max |
| Labor Force (Thousand People) (C5) | The term is defined as all individuals aged 15 and above who contribute to the production of goods and services within a specified period. This definition encompasses both those currently employed and those who are unemployed but actively seeking work, as well as first-time job seekers. | World Bank Group (2024d) | İnam and Murat (2023) | Max |
| Trade Openness (%) (C6) | It is defined as the ratio of a country's total imports and exports to its GDP. | World Bank Group (2024e) | Činčikaitė and Meidute-Kavaliauskiene (2023), Faruq (2023), Rachdi et al. (2016), Suryanta and Patunru (2022) Singhania and Gupta (2011), Sahiti et al. (2018), Saini and Singhania (2018) | Max |
| Corruption Perceptions Index (CPI) (C7) | The index uses a quantitative approach to measure perceived levels of corruption in the public sector. It uses a scale that ranges from 0 (high) to 100 (low). | Transparency International (2024) | Egger and Winner (2006), İnam and Murat (2023), Mathur and Singh (2013) | Max |
| Electricity Production (TWh) (C8) | It represents electricity generation in terawatt-hours (TWh) per year. | Enerdata (2024) | Alam (2013), İnam and Murat (2023), Kar and Tatlısöz (2008) | Max |
| Economic Freedom Index (EFI) (C9) | It is the right to control labor and property. In an economically free society, individuals can engage in any economic activity they choose. Governments permit the free movement of labor, capital, and goods and refrain from any form of coercion that exceeds the extent necessary to protect liberty. The variable ranges from 0 (low) to 100 (high). | Heritage Foundation (2024) | İnam and Murat (2023), Saini and Singhania (2018), Şenalp (2019), Mitsi (2023), Tag and Degirmen (2022) | Max |
| Inflation Rate (%) (C10) | The consumer price index measures a country's average prices over a period based on the cost of a basket of goods and services. The inflation rate is the percentage change in the average consumer price index. | IMF (2024) | Činčikaitė and Meidute-Kavaliauskiene (2023), Demir et al. (2021), Faruq (2023), İnam and Murat (2023), Rachdi et al. (2016), Singhania and Gupta (2011), Zheng (2009) | Min |
| Corporate Tax (%) (C11) | It is a form of direct taxation imposed on the income of corporations. | Tax Foundation (2023) | Abdioğlu et al. (2016), Gurshev (2019), Öz-Yalaman (2020), Sahiti et al. (2018) | Min |

**Source:** Author's compilation.

Table 1 presents the primary performance criteria in FDI attractiveness, the definitions of the criteria, and the reference databases and reference studies for the data utilized.

### 3.2. Methods

In this study, the CRITIC, LOPCOW, and common weighting methods were employed to evaluate the performance criteria of BRICS-T countries in attracting FDI. The CRITIC method was chosen because it is a well-established and useful method compared to other current weighting methods. The LOPCOW method is relatively new, open to improvement, and has simple calculation steps. It also facilitates more effective comparisons of alternatives by establishing reasonable criteria weights (Keleş, 2024, p. 219). To ensure the consistency of these weights, a common weighting approach was employed (Meral, 2024, p. 635). The ARAS method stands out from other MCDM methods by enabling ranking based on the optimal value. It is also considered easy to understand, short in calculation time, and low in mathematical operations, yet reliable (Ecer, 2016, p. 89). For these reasons, the ARAS method was used for performance ranking.

#### 3.2.1. The CRITIC method

The CRITIC (Criteria Importance Through Intercriteria Correlation) is a method developed to objectively determine the weights of criteria in decision-making problems (Diakoulaki et al., 1995). The method is distinct from other criteria weighting methods in that it is based on objective weighting using standard deviations of criteria and correlations between criteria (Elma, 2024, p. 468; Peng and Huang, 2020, p. 707). This approach offers distinct advantages, including the reduction of subjectivity and the exclusion of non-dominant characteristics (Baki, 2024, p. 1562; Keleş, 2024, p. 219).

The CRITIC's steps are (Diakoulaki, 1995, pp. 764-765; Apan and Tiyek, 2023, pp. 51-52):

Step 1. Creation of the decision matrix:

$$X = \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_m \end{matrix} \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \qquad (i = 1,2,...,m;\ j = 1,2,...,n) \tag{1}$$

where, $m$ : number of decision alternatives,

$n$ : number of evaluation criteria,

$x_{ij}$ : It is the performance of $i$ th alternative with respect to $j$ th criterion.

Step 2. Normalization of the decision matrix:

$$r_{ij} = \frac{x_{ij} - x_j^{\min}}{x_j^{\max} - x_j^{\min}} \qquad \text{(for maximization-oriented criteria)} \tag{2}$$

$$r_{ij} = \frac{x_j^{\max} - x_{ij}}{x_j^{\max} - x_j^{\min}} \qquad \text{(for minimization-oriented criteria)} \tag{3}$$

where, $r_{ij}$ : a normalized value of the decision matrix,

$x_j^{\max}$ : the largest evaluation criterion value,

$x_j^{\min}$ : the smallest evaluation criterion value.

Step 3. Creation of correlation coefficient matrix:

$$\rho_{jk} = \frac{\sum_{i=1}^{m}(r_{ij} - \overline{r_j}).(r_{ik} - \overline{r_k})}{\sqrt{\sum_{i=1}^{m}(r_{ij} - \overline{r_j})^2}.\sqrt{\sum_{i=1}^{m}(r_{ik} - \overline{r_k})^2}} \qquad j,k = 1,2,...,n \tag{4}$$

where, $\rho_{jk}$ : the correlation coefficient.

Step 4. Calculation of $C_j$ values:

$$C_j = \sigma_j . \sum_{k=1}^{n}(1 - \rho_{jk}) \quad j = 1,2,...,n \tag{5}$$

where, $C_j$ : this term denotes the aggregate data encompassed by the criterion designated as $j$.

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^{m}(r_{ij} - \overline{r_j})^2}{m-1}} \tag{6}$$

where, $\sigma_j$ : this is the standard deviation of column values in a normalised decision matrix.

Step 5. Calculation of criteria weights:

$$w_j = \frac{c_j}{\sum_{k=1}^{n} c_j} \qquad j = 1,2,...,n \tag{7}$$

where, $w_j$ : Criterion weights.

### 3.2.2. The LOPCOW method

The Logarithmic Percentage Change-driven Objective Weighting (LOPCOW) method was developed by Ecer and Pamucar (2022) as an objective criteria weighting method. The method allows for the use of negative values for alternatives in order to obtain criteria weights. It facilitates the efficient operation of a considerable number of criteria and alternatives. This method entails the calculation of the standard deviation for each criterion and the percentage values, which are determined through a logarithmic function contingent upon the number of alternatives (Keleş, 2024, p. 219). It also presents the disparity between the most and least crucial criteria in a manner that is more rational (Ecer and Pamucar, 2022, pp. 4-5).

The LOPCOW's steps are (Ecer and Pamucar, 2022, pp. 4-5):

Step 1. Creation of the decision matrix:

$$X = \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_m \end{matrix} \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \qquad (i = 1,2,...,m; j = 1,2,...,n) \tag{8}$$

where, $m$ : number of decision alternatives,

$n$ : number of evaluation criteria.

Step 2. Normalization of the decision-matrix:

$$r_{ij} = \frac{x_{\max} - x_{ij}}{x_{\max} - x_{\min}} \qquad \text{(for minimization-oriented criteria)} \tag{9}$$

$$r_{ij} = \frac{x_{ij} - x_{\min}}{x_{\max} - x_{\min}} \qquad \text{(for maximization-oriented criteria)} \tag{10}$$

Step 3. Derive the Percentage Value (PV) for the criteria:

$$PV_{ij} = \left| \ln \left( \frac{\sqrt{\sum_{i=1}^{m} r_{ij}^2}}{\sigma} \right) .100 \right| \tag{11}$$

where, $\sigma$ : the standard deviation

Step 4. Computation of criteria weights:

$$w_j = \frac{PV_{ij}}{\sum_{i=1}^{n} PV_{ij}} \tag{12}$$

where, $\sum_{i=1}^{n} w_j = 1$ (i.e., sum of the weights of all criteria = 1).

### 3.2.3. The common weighting method

As posited by Zavadskas and Podvezko (2016), common criteria weighting can be achieved by integrating multiple criteria weighting techniques. The joint weighting of the CRITIC and LOPCOW methods, utilized for objective criteria weighting, is illustrated in Equation 13 (Meral, 2024, p. 631; Peng and Huang, 2020, p. 708):

$$w_j = \frac{w_j, CRITIC * w_j, LOPCOW}{\sum_{j=1}^{m} w_j, CRITIC * w_j, LOPCOW} \tag{13}$$

### 3.2.4. The ARAS method

The Additive Ratio Assessment (ARAS) method was developed by Zavadskas and Turskis (2010) to rank alternatives. This method links the value of a utility function to the relative effect of values and weights of the main project criteria. This value is determined by the complex relative efficiency of a feasible alternative (Zavadskas and Turskis, 2010, p. 163). This method is a quantitative approach that enables the assessment of alternative performance levels and the calculation of the ratio of each alternative to the ideal alternative (Dadelo et al., 2012, p. 69; Keleş, 2024, p. 220). This method appears to be the most appropriate for the purpose of proportional rating when compared to other MCDM methods (Ecer, 2016, p. 91).

The ARAS's steps are (Bulduk and Ecer, 2023, pp. 321-323; Ecer, 2016, pp. 92-93; Dadelo et al., 2012, pp. 78-80; Zavadskas and Turskis, 2010, pp. 163-165):

Step 1. Creation of the decision matrix:

$$X=\begin{bmatrix} x_{01} & x_{02} & \cdots & x_{0n} \\ x_{11} & x_{12} & \cdots & x_{1n} \\ \vdots & \vdots & \cdots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \qquad (i=1,2,...,m;\ j=1,2,...,n) \tag{14}$$

where, $m$ : number of decision alternatives,
$n$ : number of evaluation criteria,
$x_{ij}$ : It is the performance of $i$ th alternative with respect to $j$ th criterion,
$x_{0j}$ : It is the optimal value of the $j$ th criterion.

Step 2. Normalization of the decision-matrix:

$$\bar{x}_{ij}=\frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \qquad \text{for maximization-oriented criteria)} \tag{15}$$

$$\bar{x}_{ij}=\frac{1/x_{ij}}{\sum_{i=0}^{m} x_{ij}} \qquad \text{(for minimization-oriented criteria)} \tag{16}$$

where, $\bar{x}_{ij}$ :It is the normalized value of $x_{ij}$ .

$$\overline{X}=\begin{bmatrix} \bar{x}_{01} & \bar{x}_{02} & \cdots & \bar{x}_{0n} \\ \bar{x}_{11} & \bar{x}_{12} & \cdots & \bar{x}_{1n} \\ \vdots & \vdots & \cdots & \vdots \\ \bar{x}_{m1} & \bar{x}_{m2} & \cdots & \bar{x}_{mn} \end{bmatrix} \tag{17}$$

Step 3. Weighting of the normalized matrix:

$$\hat{x}_{ij}=\bar{x}_{ij}.w_j \tag{18}$$

$$\hat{X}=\begin{bmatrix} \hat{x}_{01} & \hat{x}_{02} & \cdots & \hat{x}_{0n} \\ \hat{x}_{11} & \hat{x}_{12} & \cdots & \hat{x}_{1n} \\ \vdots & \vdots & \cdots & \vdots \\ \hat{x}_{m1} & \hat{x}_{m2} & \cdots & \hat{x}_{mn} \end{bmatrix} \tag{19}$$

where, $\hat{x}_{ij}$ : It is the weighted normalized value of $x_{ij}$ ,
$w_j$ : It is the relative weightage of the $j$ th criterion.

Step 4. Calculation of the optimality function:

$$S_i=\sum_{j=1}^{N}\hat{x}_{ij} \tag{20}$$

where, $S_i$ : It is the optimality function value.

Step 5. Calculation of the degree of benefits:

$$K_i=\frac{S_i}{S_0} \tag{21}$$

where, $K_i$ : It is the degree of benefit.

## 4. Results and Discussion

This section presents the findings of the FDI attractiveness analysis for BRICS-T countries. The ensuing discourse will present the findings resulting from the CRITIC,

LOPCOW, and common weighting criterion weighting methods, respectively. A series of calculations were conducted to derive the annual and period averages for the criterion weightings. The performance results of the countries were then obtained by combining these criterion weighting findings with the ARAS method. As with criterion weighting, the ARAS method is calculated independently for each year and period average and displayed in tables. The decision matrix for the average of 2019-2023 is shown in Table 2. It is important to note that the tables exclusively contain the calculated data for the specified years.

**Table 2.** Decision Matrix

| Country | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Brazil | 56721.6 | 214208.3 | 1829126 | 1.73 | 106649.7 | 34.30 | 37 | 53.16 | 658 | 5.82 | 34 |
| China | 164781.8 | 1410818 | 16492948 | 4.97 | 776086.1 | 36.72 | 43 | 54.52 | 8424.2 | 1.7 | 26.8 |
| India | 47387.2 | 1406573 | 3116224 | 4.47 | 544739.2 | 43.78 | 40 | 55 | 1669.4 | 5.72 | 30.8 |
| Russia | 14856.8 | 144701.7 | 1863407 | 1.34 | 73605.87 | 46.10 | 28.2 | 58.26 | 1143.6 | 6.84 | 22.8 |
| South Africa | 12573.2 | 59317.92 | 386158.3 | 0.30 | 24041.98 | 58.29 | 43.2 | 57.74 | 239.2 | 4.96 | 29.2 |
| Türkiye | 10499.8 | 84083.47 | 863270.1 | 4.83 | 33476.52 | 68.75 | 37.4 | 61.36 | 319.6 | 34.66 | 24.2 |

**Source:** Enerdata (2024), Heritage Foundation (2024), IMF (2024), Tax Foundation (2023), Transparency International (2024), UNCTADstat (2024), World Bank Group (2024a), World Bank Group (2024b), World Bank Group (2024c), World Bank Group (2024d) and World Bank Group (2024e).

As illustrated in Table 2, China ranked first in terms of the highest FDI inflows during the period under consideration. The second and third positions were occupied by Brazil and India, respectively. Conversely, Türkiye experienced the lowest FDI inflows. Notably, China and India are prominent countries in terms of population size. In terms of GDP, a metric of market size, China's dominance is unmistakable. It is noteworthy that China, India, and Türkiye are distinguished by their notable economic growth rates. In terms of labor force, China ranked first, while India ranked second. Türkiye has been identified as the nation with the highest degree of trade openness. The Corruption Perceptions Index reveals that South Africa and China received the highest scores. According to the EFI, Türkiye demonstrated the highest score, indicating a robust economic freedom ranking. Additionally, China has been recognized as a global leader in electricity produstion, achieving a substantial lead in this sector. Conversely, Türkiye has the highest inflation rate, while China has the lowest. Additionally, Brazil has the highest corporate tax rate, while Russia has the lowest.

**Table 3.** Criteria Weighting Results of the CRITIC Method

| | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | $w_j$ | 0.1106 | 0.0890 | 0.0609 | 0.0669 | 0.0694 | 0.1194 | 0.1509 | 0.0879 | 0.0569 | 0.0950 | 0.0931 |
| | Rank | 3 | 6 | 10 | 9 | 8 | 2 | 1 | 7 | 11 | 4 | 5 |
| 2020 | $w_j$ | 0.0677 | 0.0953 | 0.0568 | 0.1121 | 0.0729 | 0.1085 | 0.1805 | 0.0748 | 0.0551 | 0.0969 | 0.0794 |
| | Rank | 9 | 5 | 10 | 2 | 8 | 3 | 1 | 7 | 11 | 4 | 6 |
| 2021 | $w_j$ | 0.0752 | 0.0949 | 0.0621 | 0.0862 | 0.0744 | 0.1176 | 0.1681 | 0.0885 | 0.0605 | 0.0783 | 0.0942 |
| | Rank | 8 | 3 | 10 | 6 | 9 | 2 | 1 | 5 | 11 | 7 | 4 |
| 2022 | $w_j$ | 0.0794 | 0.0668 | 0.0511 | 0.1242 | 0.0557 | 0.0853 | 0.1142 | 0.2387 | 0.0493 | 0.0648 | 0.0705 |
| | Rank | 5 | 7 | 10 | 2 | 9 | 4 | 3 | 1 | 11 | 8 | 6 |
| 2023 | $w_j$ | 0.0836 | 0.0670 | 0.0511 | 0.0763 | 0.0573 | 0.0987 | 0.1446 | 0.2410 | 0.0489 | 0.0651 | 0.0663 |
| | Rank | 4 | 6 | 10 | 5 | 9 | 3 | 2 | 1 | 11 | 8 | 7 |
| Avr. | $w_j$ | 0.0820 | 0.0844 | 0.0582 | 0.1029 | 0.0676 | 0.1070 | 0.1691 | 0.1014 | 0.0560 | 0.0870 | 0.0844 |
| | Rank | 8 | 6 | 10 | 3 | 9 | 2 | 1 | 4 | 11 | 5 | 7 |

**Source:** Author's calculations.

As shown in Table 3, the CRITIC method indicates that the CPI constitutes the most significant criterion. This is followed by trade openness and economic growth rate. Although EFI ranked fourth according to the period average, it exhibited the highest criterion weight in 2022 and 2023. Conversely, electricity production and FDI inflow demonstrated the lowest criteria weights, from least to most significant.

**Table 4.** Criteria Weighting Results of the LOPCOW Method

| | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | $w_j$ | 0.0544 | 0.0348 | 0.0095 | 0.0698 | 0.0495 | 0.1124 | 0.1811 | 0.1217 | 0.0092 | 0.2302 | 0.1274 |
| | Rank | 7 | 9 | 10 | 6 | 8 | 5 | 2 | 4 | 11 | 1 | 3 |
| 2020 | $w_j$ | 0.0348 | 0.0358 | 0.0078 | 0.0751 | 0.0527 | 0.0879 | 0.2111 | 0.1369 | 0.0087 | 0.2142 | 0.1350 |
| | Rank | 9 | 8 | 11 | 6 | 7 | 5 | 2 | 3 | 10 | 1 | 4 |
| 2021 | $w_j$ | 0.0290 | 0.0364 | 0.0076 | 0.0981 | 0.0554 | 0.0798 | 0.1867 | 0.1505 | 0.0085 | 0.2304 | 0.1176 |
| | Rank | 9 | 8 | 11 | 5 | 7 | 6 | 2 | 3 | 10 | 1 | 4 |
| 2022 | $w_j$ | 0.0470 | 0.0303 | 0.0082 | 0.1426 | 0.0468 | 0.0544 | 0.1562 | 0.1733 | 0.0077 | 0.2109 | 0.1226 |
| | Rank | 7 | 9 | 10 | 4 | 8 | 6 | 3 | 2 | 11 | 1 | 5 |
| 2023 | $w_j$ | 0.0264 | 0.0326 | 0.0095 | 0.1262 | 0.0487 | 0.0585 | 0.1644 | 0.1699 | 0.0080 | 0.2218 | 0.1341 |
| | Rank | 9 | 8 | 10 | 5 | 7 | 6 | 3 | 2 | 11 | 1 | 4 |
| Avr. | $w_j$ | 0.0273 | 0.0352 | 0.0091 | 0.1062 | 0.0542 | 0.0843 | 0.1861 | 0.1034 | 0.0089 | 0.2504 | 0.1348 |
| | Rank | 9 | 8 | 10 | 4 | 7 | 6 | 2 | 5 | 11 | 1 | 3 |

**Source:** Author's calculations.

As indicated by the findings presented in Table 4, the inflation rate emerged as the paramount criterion, maintaining its dominance throughout the entire period under consideration. The CPI was the second most significant criterion. However, it is noteworthy that this criterion ranked third in terms of criterion weight in 2022 and 2023. The period average indicates that the third most significant criterion was corporate tax. Conversely, economic growth rate, the EFI, and trade openness emerged as the other most significant criteria, respectively. The least important criteria were (from lowest to highest) electricity production, GDP and FDI (inflow).

The CRITIC and LOPCOW methods resulted in different criteria weightings. In order to reach more consistent findings, the common criteria weighting method was applied. The findings of this method are shown in Table 5.

**Table 5.** Results of the Common Weighting Method

| | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 | $w_i$ | 0.0581 | 0.0299 | 0.0056 | 0.0451 | 0.0332 | 0.1296 | 0.2641 | 0.1034 | 0.0051 | 0.2113 | 0.1145 |
| | Rank | 6 | 9 | 10 | 7 | 8 | 3 | 1 | 5 | 11 | 2 | 4 |
| 2020 | $w_i$ | 0.0218 | 0.0315 | 0.0041 | 0.0777 | 0.0355 | 0.0880 | 0.3518 | 0.0945 | 0.0044 | 0.1917 | 0.0990 |
| | Rank | 9 | 8 | 11 | 6 | 7 | 5 | 1 | 4 | 10 | 2 | 3 |
| 2021 | $w_i$ | 0.0213 | 0.0330 | 0.0045 | 0.0807 | 0.0393 | 0.0895 | 0.2994 | 0.1270 | 0.0049 | 0.1720 | 0.1056 |
| | Rank | 9 | 8 | 11 | 6 | 7 | 5 | 1 | 3 | 10 | 2 | 4 |
| 2022 | $w_i$ | 0.0330 | 0.0179 | 0.0037 | 0.1568 | 0.0231 | 0.0411 | 0.1578 | 0.3660 | 0.0034 | 0.1209 | 0.0764 |
| | Rank | 7 | 9 | 10 | 3 | 8 | 6 | 2 | 1 | 11 | 4 | 5 |
| 2023 | $w_i$ | 0.0198 | 0.0196 | 0.0044 | 0.0863 | 0.0250 | 0.0517 | 0.2132 | 0.3672 | 0.0035 | 0.1295 | 0.0797 |
| | Rank | 8 | 9 | 10 | 4 | 7 | 6 | 2 | 1 | 11 | 3 | 5 |
| Avr. | $w_i$ | 0.0214 | 0.0284 | 0.0050 | 0.1043 | 0.0350 | 0.0861 | 0.3004 | 0.1001 | 0.0048 | 0.2079 | 0.1085 |
| | Rank | 9 | 8 | 10 | 4 | 7 | 6 | 1 | 5 | 11 | 2 | 3 |

**Source:** Author's calculations.

As indicated in Table 5, the CPI was ranked first according to the common weighting method. However, during the 2022-2023 period, the CPI ranked second. In terms of the period average, inflation rate and corporate tax were identified as the other important

criteria. However, it is noteworthy that the relative importance of both criteria exhibited a decline over the observed period. Notably, EFI, which holds the fifth criterion weight, emerged as the paramount criterion in the 2022-2023 period. Conversely, GDP and electricity production exhibited the lowest weights.

While LOPCOW and the common weighting methods produced more similar results, the criterion weights that emerged according to the CRITIC method were more different. When all three methods are considered collectively, the most important criterion is CPI. However, the LOPCOW method identified the inflation rate as the primary criterion. The EFI criterion weight exhibited a substantial increase over time. Electricity production and GDP exhibited the lowest criterion weights across all methods. Conversely, the 8th and 9th ranked criteria exhibited equivalent weights in LOPCOW and common methods, yet these weights diverged in the CRITIC approach.

In terms of criterion weights, the inflation rate emerges as a critical criterion in this study, aligning with the findings of Gupta and Singh (2016). While Vijayakumar et al. (2010) indicate that the market size variable is important in BRICS countries, the weight of the relevant criterion is low in this study. In numerous studies (Gupta and Singh, 2016; Shah and Ali, 2016; Asongu et al., 2018; Maryam and Mittal, 2020), GDP and trade openness are identified as significant criteria for BRICS countries. However, the weight values of these criteria are found to be low in this study.

**Table 6.** The CRITIC-ARAS Performance Results and Rankings

| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | Average of Period | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank |
| Brazil | 0.3960 | 4 | 0.6024 | 4 | 0.3346 | 6 | 0.4228 | 4 | 0.4061 | 3 | 0.3738 | 4 |
| China | 0.9354 | 1 | 0.9289 | 2 | 0.9222 | 1 | 0.8515 | 1 | 0.9115 | 1 | 0.9455 | 1 |
| India | 0.5975 | 2 | 0.9591 | 1 | 0.5564 | 2 | 0.6383 | 2 | 0.5757 | 2 | 0.5975 | 2 |
| Russia | 0.4073 | 3 | 0.5795 | 5 | 0.3610 | 4 | 0.2743 | 6 | 0.3705 | 5 | 0.3454 | 5 |
| South Africa | 0.3503 | 5 | 0.7365 | 3 | 0.3552 | 5 | 0.3840 | 5 | 0.3670 | 6 | 0.3443 | 6 |
| Türkiye | 0.3486 | 6 | 0.3195 | 6 | 0.3958 | 3 | 0.4524 | 3 | 0.4031 | 4 | 0.4113 | 3 |

**Source:** Author's calculations.

As demonstrated in Table 6, China has consistently exhibited the highest level of FDI attractiveness among all nations, with the exception of the year 2020. The second and third positions were occupied by India and Türkiye, respectively. India attained the top ranking in 2020 and the second position in the other years. Türkiye, conversely, initially ranked last in 2019 and 2020, subsequently ascending to third place in 2021-2022, but then ranking fourth in 2023. The lowest-performing countries were South Africa, Brazil, and Russia. Despite Russia's commendable performance in 2019, where it ranked third, its performance exhibited a notable decline, resulting in its relegation to the lowest rank in 2022. In 2023, Russia ascended to the fourth position, exhibiting the lowest performance in comparison to its period average.

**Table 7.** The LOPCOW-ARAS Performance Results and Rankings

| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | Average of Period | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank |
| Brazil | 0.5453 | 5 | 0.7698 | 5 | 0.3726 | 6 | 0.4407 | 5 | 0.3457 | 5 | 0.4386 | 5 |
| China | 0.9171 | 1 | 0.9121 | 3 | 0.9229 | 1 | 0.8486 | 1 | 0.9123 | 1 | 0.9443 | 1 |
| India | 0.6760 | 2 | 0.9337 | 1 | 0.5335 | 2 | 0.6376 | 2 | 0.4976 | 2 | 0.6073 | 2 |
| Russia | 0.5701 | 3 | 0.7768 | 4 | 0.4142 | 5 | 0.2864 | 6 | 0.3541 | 4 | 0.4247 | 6 |
| South Africa | 0.5518 | 4 | 0.9179 | 2 | 0.4399 | 4 | 0.4429 | 4 | 0.3305 | 6 | 0.4589 | 4 |
| Türkiye | 0.4800 | 6 | 0.5162 | 6 | 0.4579 | 3 | 0.4619 | 3 | 0.3722 | 3 | 0.4677 | 3 |

**Source:** Author's calculations.

As indicated in Table 7, China has consistently demonstrated the highest level of FDI attractiveness among all countries, with the exception of 2020. The second and third positions were occupied by India and Türkiye, respectively. India attained the top ranking in 2020 and the second position in the other years. Türkiye, on the other hand, ranked last in 2019 and 2020, and ranked 3rd from 2021 onwards. Conversely, South Africa, Brazil, and Russia demonstrated the lowest performance levels. Despite Russia's commendable performance in 2019, where it ranked third, its performance exhibited a decline, resulting in its relegation to the lowest rank in 2022. In 2023, Russia ascended to the fourth position, exhibiting the lowest performance in comparison to its period average.

**Table 8.** The Common Weighting-ARAS Performance Results and Rankings

| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | Average of Period | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank | $K_i$ | Rank |
| Brazil | 0.5841 | 5 | 0.8526 | 4 | 0.4410 | 6 | 0.5564 | 5 | 0.5052 | 5 | 0.4949 | 5 |
| China | 0.9057 | 1 | 0.9109 | 3 | 0.9183 | 1 | 0.8114 | 1 | 0.8995 | 1 | 0.9429 | 1 |
| India | 0.6956 | 2 | 1.0077 | 2 | 0.5909 | 2 | 0.7407 | 2 | 0.6224 | 2 | 0.6519 | 2 |
| Russia | 0.5950 | 4 | 0.8191 | 5 | 0.4636 | 5 | 0.3813 | 6 | 0.4925 | 6 | 0.4629 | 6 |
| South Africa | 0.6177 | 3 | 1.0366 | 1 | 0.5216 | 4 | 0.5587 | 4 | 0.5132 | 4 | 0.5320 | 4 |
| Türkiye | 0.5401 | 6 | 0.5874 | 6 | 0.5352 | 3 | 0.6180 | 3 | 0.5394 | 3 | 0.5422 | 3 |

**Source:** Author's calculations.

As seen in Table 8, China has consistently exhibited the highest levels of FDI attractiveness across all periods, with the exception of the year 2020. China was followed by India and Türkiye, respectively. India attained the top position in 2020 and the second position in the other years. Türkiye, on the other hand, ranked last in 2019 and 2020, and ranked third since 2021. Conversely, South Africa, Brazil, and Russia demonstrated the lowest performance ratings. Notably, Russia's performance ranking has shown a marked decline.

The study revealed that, while the CRITIC-ARAS integrated performance results exhibited greater variability, the LOPCOW-ARAS and The Common Weighting-ARAS integrated performance results demonstrated significant similarity. A similar outcome was observed in the three integrated methods. The findings indicate that China and India consistently dominate the rankings as the top two countries in terms of integrated ARAS performance. Türkiye's ranking changed from sixth in 2019 and 2020 to third in 2021. A comparison of the results across the three methods reveals that the rankings differed primarily within the final three positions. The CRITIC-ARAS integrated method consistently placed Brazil in fourth position, while the other integrated methods placed Brazil in fifth. The findings suggest an enhancement in Brazil's performance. Conversely, Russia attained the 5th position according to the CRITIC-ARAS integrated method and the 6th position according to the other integrated methods. Conversely, South Africa exhibited a consistent ranking of 6th in the CRITIC-ARAS integrated method and a shift to 4th in the other integrated methods. There is also a general decline in the performance of Russia and South Africa.

In terms of countries, as argued by Maryam and Mittal (2020), China plays a leading role with a significant difference among the BRICS countries that attract the most FDI. Contrary to the findings reported by Altuntaş and Gök (2020), Türkiye demonstrated a low FDI attractiveness performance in 2019. According to İnam and Murat (2023), similar to this study, while China and India showed high FDI attractiveness performance in 2020, Türkiye's performance was low. In addition, the findings of this study on country rankings are consistent with the results of the venture capital and private equity country attractiveness index 2023 developed by Groh et al. (2024). In this respect, the study has produced results that are broadly similar to the literature.

## 5. Conclusion

This study evaluates the attractiveness of FDI, which plays a pivotal role in both the FDI of MNCs and the economic growth and development of countries. The present study considers BRICS-T countries and data from the period 2019-2023. To assess the attractiveness of FDI for BRICS-T countries, the CRITIC and LOPCOW methods were employed as objective criterion weighting methods, in conjunction with the common weighting method that integrates these methods. The ARAS method was employed to derive the FDI attractiveness performance rankings of BRICS-T countries.

According to CRITIC and common weighting methods, the most important criterion is CPI scores, while according to the LOPCOW method it is the inflation rate. However, it is noteworthy that the criterion weight of CPI scores has exhibited a downward trend over time. Conversely, the criterion weight of EFI scores has exhibited an upward trajectory across all three methodologies. Notably, the CRITIC and common weighting methods attribute the highest criterion weight to EFI scores, a position that has been solidified as of 2022. A collective evaluation of the methods reveals that CPI and EFI scores are regarded as significant criteria, yet the rise in the criterion weight of EFI scores has been noteworthy. Conversely, electricity production and GDP, representing market size, exhibited the lowest criterion weights across all three criterion weighting methods. The ranking of these criteria has remained relatively stable over time.

According to the integrated performance results of all criteria weighting methods and the ARAS method, China, India, and Türkiye are distinguished among the BRICS-T countries in terms of FDI attractiveness. Conversely, Brazil, South Africa, and Russia among the countries with the lowest FDI attractiveness. The study further revealed that BRICS-T countries exhibit a greater degree of heterogeneity in their FDI attractiveness profiles. In this framework, different assessments were made for each country.

China has consistently demonstrated its ability to attract FDI by ranking first in numerous criteria, including FDI inflow, GDP, population, economic growth rate, labor force, electricity production, and low inflation rate. Nevertheless, in order to maintain this advantageous position, it is essential for China to prioritize the elevation of its CPI and EFI ratings, along with the reduction of its corporate tax rate.

While India had the highest FDI attractiveness in 2020, it ranked second in all remaining years (2019, 2021-2023). The country's superior performance in terms of FDI attractiveness can be attributed to its higher CPI scores when compared to those of other countries. Nevertheless, India must augment its trade openness and reduce its corporate tax in order to attract greater FDI.

Türkiye's ranking has shown consistent improvement in recent years, as evidenced by its third-place ranking in 2021-2023 and last-place ranking in 2019-2020 according to all methods. This notable progress can be attributed to several key factors, including high trade openness, low corporate tax rates, and a high economic growth rate. These elements have contributed to Türkiye's position as a competitive destination for FDI. In terms of EFI scores, Türkiye has consistently ranked ahead of BRICS countries, particularly in light of the increasing weight accorded to the criteria over time. Türkiye has been recognized as a low corporate tax country, ranking second among the BRICS-T countries. These two factors have contributed to Türkiye's attractiveness in terms of FDI. In the 2019-2023 period, Türkiye has maintained its position as a leading economy, ranking second after China in terms of high economic growth rates. It is anticipated that Türkiye's appeal as an FDI destination will continue to rise if it can maintain its high economic growth rates. Furthermore, Türkiye has the highest trade openness among the BRICS-T countries, though the criterion weight effect of trade openness has declined over time. Türkiye differs from other countries with its high inflation rates. In this respect, in order to reduce inflation rates, the causes of high inflation should be further investigated and more precise solutions should be developed. Moreover, Türkiye needs to increase its CPI score in order to increase its FDI attractiveness.

Brazil ranked 4th according to the ARAS-CRITIC method and 5th overall according to the ARAS-LOPCOW and ARAS-common weighting methods. In 2021, it ranked 6th according to all methods. Brazil's low FDI attractiveness is driven by the lowest EFI scores, the lowest CPI scores, the highest corporate tax rate and the lowest trade openness. This suggests that Brazil needs to do more to reduce the perception of corruption. It also needs to offer investors a freer economic environment. Opening the Brazilian economy to more foreign trade and lowering the very high corporate tax rate are expected to increase the attractiveness of FDI.

Over time, South Africa has experienced a decline in its FDI attractiveness. Despite its advantageous position, characterized by a high CPI score, substantial trade openness, and a low inflation rate when compared to other nations, South Africa's economic growth rate and its high corporate tax rate have contributed to its limited FDI appeal. Consequently, if South Africa were to enhance its economic growth rate and reduce its corporate tax rate, it could potentially foster a more conducive environment for MNCs to direct their FDI toward this country.

Russia's situation differs significantly from other countries. Especially after the start of the Russia-Ukraine war, Russia's FDI attractiveness declined significantly due to the increasing sanctions. On the other hand, Russia's lower CPI scores compared to other countries played an important role in the decline of Russia's FDI attractiveness. However, Russia scored better on the EFI than other countries except Türkiye. Russia was mostly characterized by lower corporate tax rates than other countries. However, Russia had the lowest overall FDI attractiveness. Russia's ability to become more prominent in terms of FDI attractiveness may be more likely with the end of the Russia-Ukraine war and the easing of sanctions against Russia. At the same time, the CPI and EFI scores should increase in terms of selected criteria.

A multitude of evaluation criteria have been employed, with an emphasis placed on economic variables. However, as demonstrated in the study, the success of a country in attracting FDI is not solely determined by economic factors. The study found that, in addition to economic factors, particularly high CPI and EFI scores, play a pivotal role in determining a country's FDI attractiveness. MNCs engaging in FDI to developing countries prioritize these factors more than their counterparts in developed countries. Despite BRICS-T countries' comparatively robust economic standing, they have yet to match the levels of corruption perception and economic freedom observed in developed countries. Consequently, it is recommended that BRICS-T countries prioritize these criteria to enhance their attractiveness to MNCs, thereby fostering increased FDI. In this regard, it is anticipated that the investments of MNCs in these countries will experience an uptick if negative perceptions regarding freedoms and the law are addressed and transparency is guaranteed within the public sphere.

This study differs from other studies in that it focuses on the FDI attractiveness of the BRICS-T countries using MCDM methods. At the same time, the use of the most recent data and the combination of different criterion weighting methods and the ARAS method make the study more unique. Thus, the study is expected to contribute to the existing literature and provide guidance for future studies. As such, the study not only provides the performance ranking of countries within the framework of the specified criteria, but also provides information for policy makers to increase the attractiveness of FDI. On the other hand, the study not only shows which countries stand out in attracting FDI from MNCs to developing countries, but also which countries are lagging behind. In future studies, new and different criteria can be used as well as different MCDM methods are expected to increase the interest in the FDI attractiveness of countries.

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