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Research Article

Foreign Direct Investment (FDI), Computer Information Technology, Corruption Perceptions, Economic Growth, and Trade Openness in BRICS Countries

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Abstract.
Given a Indonesia's openness and exposure to the foreign direct investment (FDI), the current study focusses on FDI, particularly inbound from it, as one of the major local and global factors that affect its economy. There are different viewpoints regarding the this effect because some see it from a positive, optimistic point of view, while some have a negative, pessimistic view that are presented researchers impartially. The goal of this research is to examine FDI, computer information technology, corruption perceptions, economic growth, and trade openness in BRICS countries using panel data from 1990 to 2021. The data used is incoming Foreign Investment data to the BRICS countries. We use the Panel Least Square (PLS) method. Results show that computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness encourage FDI in BRICS countries. The development of information and computer technology has had a significant impact on increasing FDI. The low level of corruption increases investor confidence which has a positive influence on raising the FDI in BRICS countries. Economic growth is certainly an attraction for investors to invest, supported by Trade Openness.

Keywords: Foreign Direct Investment (FDI), Computer Information Technology, Corruption Perceptions, Economic Growth, Trade Openness

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1. Introduction

Important economic advances are taking place in the modern world on several levels. The scientific and technical revolution ushered in a period of constructive international integration, and organizations like the World Trade Organization are playing a bigger part in it (Feyisa, 2020). All of these trends are proponents of globalization and constitute the overall image of the modern world economy, which is dominated by developed capitalist nations. It is no secret that multinational corporations are playing a larger role within the context of economic globalization. In particular, they are playing a larger role

in the transfer of capital from one country to another and the movement of investments globally than they did in the past (Viphindrartin & Bawono, 2021).

A number of industrialized nations have led the way in importing and exporting investment. Naturally, because they are a part of the global labor market and have a presence in the economy, emerging nations cannot avoid being affected by these global shifts, even though their location varies from country to country. Investment can be used as a source of financing solutions to solve these problems (Smallbone, Saridakis, & Abubakar, 2022).

According to the Harrod Domar theory, an investment is a sum of money that is used to make investments that enhance economic capacity and raise revenue through creating capital or other kinds of capital that boost productive capacity (Dumo, Ico, & Magpantay, 2023). Foreign investment that enters a country consists of two types, namely Foreign Direct Investment (FDI) and Portfolio Investment (da Silva-Oliveira, de Miranda Kubo, Morley, & Cândido, 2021).

An asset in the receiving country that is owned by citizens of the country of origin for the purpose of managing the assets is referred to as foreign investment (FDI). This has to do with the capital flow for exports, which is distinct from capital flow for financing and loans, or what is referred to as foreign portfolio investment, as it pertains to the buying of stocks and bonds issued by reputable investors in the country. originating nation without the company of a manager of the assets in which it has shares present in the receiving nation (Hintošová, 2021).

Investment in securities differs from foreign direct investment (FDI) in that the former requires the foreign investor to own all or a portion of the investment in a particular project, as well as to participate in project management alongside local investors in the case of joint investment or absolute ownership, or to exercise complete control over management and organization. The host nation with a variety of financial resources, technological advancements, and technical know-how in a variety of industries through investment initiatives. FDI is a long-term investment, whereas the second form of investment comprises people and organizations who possess a number of securities without exerting any control over or involvement in the planning and administration of investment projects. Investment in securities is often a short-term investment (Haudi, Wijoyo, & Cahyono, 2020).

The growth of these investment flows caused the amount of foreign direct investment to significantly accelerate in the last years of the 20th century and the early years of the 21st (Peirong & Al-Tabbaa, 2021). The majority of flows of foreign direct investment still go to developed nations. Outbound foreign investment is dominated by several wealthy

nations. The United States leads all nations in the export of foreign direct investment, and it joins the United Kingdom as the world's top two exporters (Amin, Anwar, & Liu, 2022).

The domination of several developed countries in foreign direct investment, especially its sources, can be seen from the perspective of multinational companies. As for developing countries, though their percentage receiving direct investment is increasing. China is at the forefront of developing countries accepting foreign direct investment (Bu, Li, & Jiang, 2019). The BRICS countries are developing countries that continue to experience improvements in their economies and are recipient countries of direct investment from developed countries (Apergis, Pinar, & Unlu, 2023). But the BRICS countries are also starting to invest directly in other countries with growing economies (Pradhan, Sachan, Sahu, & Mohindra, 2022).

One of the fundamental types of globalization is foreign direct investment, and multinational firms are crucial to its flow. Foreign direct investment, according to proponents of globalization and the openness of the global economy, offers a number of advantages that are reflected in the economies of the nations that receive these investment flows (Muminov, Hoshimov, Muxitdinova, & Umarov, 2020). A nation will acquire the newest technology advancements that can be utilized and promote enhanced economic development when it opens itself to foreign direct investment and allows this investment flow by welcoming multinational corporations (Petricevic & Teece, 2019). The level of investor confidence is very important in encouraging FDI. Corruption is an indicator of financial security and has a direct impact on foreign direct investment (Wang, Wang, & Sun, 2020).

Given a country's openness and exposure to this sort of investment, the focus of the current study is on FDI, particularly inbound from it, as one of the major local and global factors that affect its economy. There are different viewpoints regarding the vision of this effect, because some see it from a positive, optimistic point of view and some have a negative, pessimistic view of this view and that presented by the researcher impartially. The goal of this research is to examine Foreign Direct Investment (FDI), computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness in BRICS countries. This research contributes to economic and business knowledge, especially regarding the factors that influence Foreign Direct Investment (FDI) in BRICS countries (Brazil, Russia, India, China, and South Africa). This research uses new variables that have not been studied much before, namely Computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness. This research also uses a panel data analysis method which is more accurate and efficient

in testing the relationship between these variables. This research provides implications for governments and business actors in BRICS countries to increase FDI by improving the quality and accessibility of information and computer technology, reducing levels of corruption, maintaining stable economic growth, and opening up trade opportunities with other countries.

2. Research Method

One possible approach to study the relationship between FDI, computer information technology, perceptions of corruption, economic growth, and trade openness in BRICS countries is to use panel data analysis. This method allows us to capture cross-sectional and temporal variations in the data, as well as control for country-specific and time-specific impacts. The population studied was the BRICS countries, namely Brazil, Russia, India, China and South Africa. These countries are developing countries that have an important role in the global market and have attracted a lot of foreign investment in recent years. Sample selection depends on the availability and quality of data for each country and each variable because we use secondary data.

FDI is measured as the net inflow of investment from foreign entities to domestic entities that acquire at least 10% of the domestic entity's voting rights. FDI can be divided into three components: equity capital, reinvested earnings, and intra-company loans. We use data from the World Bank's World Development Indicators (WDI) to obtain net FDI inflows as a percentage of GDP for each country and each year.

There are various indicators that can be used to measure the level of computer information technology in a country, such as internet users, mobile subscriptions, fixed broadband subscriptions, etc. We use data from the World Bank's WDI to derive these indicators for each country and each year. Perceived corruption refers to how corrupt a country's public sector is according to experts and business people. One of the most widely used sources of corruption perception data is the Corruption Perception Index (CPI) published by Transparency International. The CPI ranks countries from 0 (very corrupt) to 100 (very clean) based on various surveys and assessments. You can use the CPI scores for each country and each year as a proxy for perceptions of corruption.

Economic growth is usually measured by the growth rate of real GDP per capita, which is the total value of goods and services produced in a country adjusted for inflation and population. We use data from the World Bank's WDI to obtain real GDP per capita and its growth rate for each country and each year.

Trade openness is usually measured by the ratio of total trade (exports plus imports) to GDP. This reflects how much a country is involved in international trade compared to the size of its economy. We use data from the World Bank's WDI to obtain the trade openness ratio for each country and each year. We investigate Foreign Direct Investment (FDI), computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness in BRICS countries using panel data. We use the period 1990 to 2021. The data used is incoming Foreign Investment data. to the BRICS countries. We use the Panel Least Square (PLS) method. The equation model to be estimated in this study is as follows:

$$FDI_{it} = \beta_0 + \beta_1 ICT_{it} + \beta_2 CPI_{it} + \beta_3 GDP_{it} + \beta_4 TO_{it} + \varepsilon_{it}$$

Information:

ICT_{it} = ICT development in country i in period t

CPI_{it} = Corruption Perceptions score in country i in period t

GDP_{it} = the value of GDP in country i in period t

TO_{it} = Trade Openness ratio i in period t

β_0 = Intercept / Constant

β_1, β_2, β_3,β_4 = Regression Coefficient

εit = error term (country i, year t)

There are a number of methods that may be used to analyze the regression model utilizing panel data, including the Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM) methods.

3. Research Findings And Discussion

We compared the estimation results of the PLS approach, the FEM approach, and the REM approach in table 1.

Table 1: Estimates and Panel Data Comparison.

Name	PLS	Prob.	FEM	Prob.	REM	Prob.
C	-3,862283	0,0101	-8,698978	0,0001	-5,382653	0,0101
ICT	0,001907	0,3659	-0,000275	0,9496	0,002037	0,3825
CPI	0,012680	0,0001	0,008405	0,3838	0,008958	0,0356
GDP	2,011218	0,0101	1,187345	0,0062	0,605001	0,0112
TO	0,519373	0,0192	1,835884	0,0242	0,887752	0,0078
R-squared	0,824201		0,866901		0,655877	

Based on the panel data estimation results in table 1 with FDI as the dependent variable, the REM outperforms the other models. The coefficient value of each independent variable in each model demonstrates this. The FEM outperforms other models as measured by R-squared.

After the analysis is carried out, then to choose which model is the most appropriate between the PLS or the FEM, it can be searched by using the Chow Test. The Chow test is used to choose between the FEM and the pooled least square model as the analytical model that is most suited. The following hypothesis guides the execution of this test:

H0 = Using PLS

H1 = Using a FEM

H0 is rejected on the basis of the Chi-square statistical considerations as follows:

1. Statistic <Ftable or statistical probability value> critical probability value (α = 5%), then the null hypothesis (H0) is accepted.

2. Statistic> F table or statistical probability value <critical probability value (α = 5%), then the H0 is rejected and the H1 is accepted. Table 2 displays the results of the Chow Test.

Table 2: Chow Test Results.

Name	Stat.	d.f	Prob.
Cross-sec. F	1,711212	(4,11)	0,0612
Cross-sec. Chi-sq.	1.4113113	4	0,0572

Table 2 shows that the Chi-square prob value > 5%, namely 0.0572 > 0.05. In other words, H1 is rejected and H0 is approved. Therefore, the pooled least square model is the appropriate model to read or interpret in this investigation. Table 3 displays the estimation outcomes from the pooled least squares model.

FDI in BRICS countries significantly impacted favorably on ICT, perceptions of corruption, economic growth, corruption perceptions, and trade openness. This research finds that Computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness have a positive and significant influence on FDI in BRICS countries. This shows that the development of information and computer technology has had a significant impact on increasing FDI. In addition, low levels of corruption increase investor confidence which has a positive impact on increasing FDI in BRICS countries. High economic growth is of course an attraction for investors to invest, supported by open trade policies.

Table 3: Least Squares Pooled Model.

	Coeff.	Std. Error	t-Stat.	Prob.
C	-4,113121	1,031171	-3,617224	0,0121
ICT	0,001826	0,001231	0,722345	0,0711
CPI	0,007643	0,003221	1,052271	0,0243
GDP	1,411212	0,164432	4,211322	0,0001
TO	0,771143	0,228652	1,665113	0,0069
R-sq.	0,822116			
Adj. R-sq.	0,792311			
F-stati.	17,22111			
Prob(F-stat.)	0,000001			

4. Conclusions

Computer information technology, Corruption Perceptions, Economic Growth, and Trade Openness encourage Foreign Direct Investment (FDI) in BRICS countries. The development of information and computer technology has had a significant impact on increasing Foreign Direct Investment. The low level of corruption increases investor confidence which has a positive influence on increasing Foreign Direct Investment in BRICS countries. Economic growth is certainly an attraction for investors to invest, supported by Trade Openness. Based on the conclusions of this research, several policies can be developed to increase FDI in BRICS countries. Policy suggestions related to increasing the development of information and computer technology through investment in infrastructure, education and research. This can increase productivity, innovation and competitiveness of BRICS countries in the global market. Suggestions for increasing government transparency and accountability through legal, administrative and political reforms. This can reduce corruption, increase investor confidence, and protect property rights. Suggestions for encouraging inclusive and sustainable economic growth through sector diversification, empowering small and medium enterprises, and environmental protection. This can increase market attractiveness, social welfare and macroeconomic stability. Suggestions for increasing trade openness through tariff liberalization, elimination of non-tariff barriers, and regional integration. This can improve market access, efficient resource allocation, and international cooperation.

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