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| RESEARCH ARTICLE

Data-Driven insights on the relationship between BRICS financial policies and global investment trends

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| ABSTRACT

This study investigates the dynamic relationship between the financial policies of BRICS nations—Brazil, Russia, India, China, and South Africa—and global investment trends. As emerging markets like the BRICS play a crucial role in the global economic growth, it is critical to understand how changing in the financial policies in these markets interact with international investment flows for both investors and policymakers. The study leverages data of economic indicators, policy measures, and global investment patterns by building regression, decision trees and deep learning models based on advanced machine learning techniques, including regression models, decision trees, deep learning methods such as Long Short-Term Memory networks and Transformers. According to the findings, there are strong correlations between fiscal, monetary and trade policies in the BRICS economies and agent behavior in the global capital market. Uncovering these patterns therefore provides actionable insights for investors to navigate the changing finance terrain of those countries better and advice for policymakers on the way to fashion policies that would attract investment. This research supports the use of data driven technique to capture the intricate economic relationship and investment prediction outcomes in the case of BRICS financial systems.

| KEYWORDS

BRICS economies, financial policies, global investment trends, machine learning, fiscal policy, monetary policy, trade policy, investment forecasting, data-driven analysis.

| ARTICLE INFORMATION

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1. Introduction

1.1 Overview of BRICS Economies and Their Financial Policies

BRICS comprising Brazil, Russia, India, China and South Africa are a collection of diverse, large and fast rising economies that are dramatically transforming the global economic status quo. Being major players of either global GDP and trade make these countries account for a large part of globalization. For a number of decades, BRICS economies have witnessed tremendous economic growth rate and have become a significant actor in the global economy by implementing many different financial policies (Batista Jr., 2021). Each of these countries has its own banking system shaped by its political, historical and economic bases; but

despite that, what interconnect all of the banks found in these counties is that they are all emerging markets that are volatile and very susceptible to global market variation.

The contents of financial policies in BRICS countries are premised on their own national priorities. For example, taxation and government spending are fiscal policies that have enormous effects in economic development and solving socio economic challenges. Due to the heavy reliance on commodity exports, such as oil and soybeans, Brazil has a fiscal approach that aims at supporting the important industries (Agarwal & Kumar, 2023). Also, fiscal policy in Russia has been intertwined with its major energy exports and India's have been about infrastructure development to support its burgeoning middle class. As far as the monetary policy of BRICS countries is concerned, they are trying to strike a balance between inflation control and economic growth. For instance, China's monetary policy is intimately related to a state controlled financial system and this latter one is critical to keep stability and control inflation (Kondratov, 2021). Likewise, BRICS economic stability is strategically handled through interest rates and central bank interventions, and their economic growth is accentuated through investment.

The other financial strategies of the BRICS are also related to trade policies. These economies also have been integrated into global trade networks and have been fundamental with regard to tariffs, trade agreements, and international partnerships. China joining the World Trade Organization (WTO) and related trade policies have made it one of the largest global economy players and India's liberalization has considerably helped its economic prosperity (Agarwal & Kumar, 2023).

1.2 The Global Impact of BRICS Financial Policies on Investment Trends

As BRICS nations continue to grow in economic stature, their financial policies also keep having an effect on global investment trends. The large consumer bases and growing industries in these countries are not only draw for international investors, but also because of the signals their financial policies give for the direction their respective countries are taking with regards to global capital flows. Foreign direct investment (FDI) is flowing not only to the BRICS economies especially China and India, but also their financial policies play a pivotal role in directing the flow of global capital to EMs (Islamet al., 2023). Here are the policies that are evolving in each of these nations such as monetary policy, fiscal policy and trade policy which as at times become signals to investors and influence global investment decisions and how capital is allocated between regions.

For instance, decisions of China on interest rates and internationalization of yuan have global impact on investment trends both in developed and developing markets (Kondratov, 2021). Brazil's fiscal measures for commodity exports and trade agreements with key partners into the international community have an impact on investment in natural resources and energy sectors around the globe (Agarwal & Kumar, 2023). Given the influence of the BRICS countries on the global economic system and the increasing importance of their financial policy in investment decisions worldwide, it is important that global investors as well as policymakers understand how the financial policies of the BRICS countries have an effect on investment decisions.

1.3 Objectives of the Study

This study aims at investigating how investment trends affected the financial policies of the Global Investment Functions in BRICS. With the help of data driven insights, this research attempts to model the effects of fiscal, monetary and trade policies on decisions concerning global capital flows and investment. With the use of machine learning techniques, the patterns and correlations between the investment trends globally and the financial measures of the BRICS countries will be explored. By this way, it endeavors to offer actionable insights to policymakers and investors on the changing positions of BRICS economies as inseparable entities for augmentation of global investment strategies. Machine learning models can be used in order to make a precise and more extensive analysis of the linkage between BRICS financial policies and global capital flows.

2. Literature Review

2.1 The Role of Financial Policies in Shaping Investment Flows

Different studies emphasize the pivotal role that financial policies have on domestic investment flows, as well as the role they have on international investment flows, in emerging economies, particularly the BRICS group. These policies set the investment climate for investors and by extension determine whether Investor's decisions will be in favor of inflow of Capital or deter capital inflows.

Investment is a major concern for the government and any influence on investment can be done via fiscal policy, taxes, government spending and debt management. In BRICS countries fiscal policy is usually used to encourage economic growth, reduce inequality and attract foreign investments (Awolusi & Mbonigaba, 2020). In such example, Brazil's fiscal incentives include tax exemptions for renewable energy and infrastructure development for the purpose of prompting investment in these sectors. But countries with high fiscal deficits have great difficulties in attracting foreign investment, as the latter is perceived as not being sustainable. Central

bank interest rates, inflation control and regulation of the supply of money affect flows of investment resources as much as any other factors. High inflation countries such as South Africa and Brazil can increase interest rates to discourage investment as higher borrowing costs (Storm, 2022). However, low inflation and interest rates usually render investment more attractive when capital becomes cheaper.

Pertaining to trade, policies such as tariffs, trade agreements and regulations on import and export directly affect the global competitiveness of the BRICS economies. For instance, China's 2001 accession to the WTO allowed its markets to be opened to the incoming of international investors and made it very attractive for investors globally (Grosse et al., 2021). India also experienced the liberalization of its trade in the 1990s, which created a drive for more FDI, specifically in IT and services sector (Kumari et al., 2023). Generally, open trade policies lead to increased FDI, while restrict policies in the same direction. Then, the investment is influenced by the financial system characteristics of BRICS countries. For example, China's state-controlled banking system allocates capital to strategic industries but does not allow foreign investors because of heavy state involvement. Unlike the market driven financial systems in the countries like India and South Africa provide more scope for foreign investment but also possess their regulatory challenges and a lot of market volatility.

2.2 Data-Driven Approaches to Financial Analysis in Emerging Markets

With financial markets and global capital flows becoming more complex, ML and big data analytics are being used to supplement traditional methods of economic analysis. For example, these methods are useful in the analysis of investment trends in still emerging economies such as the BRICS economies. This data from finance indicators, trade data, policy changes, and economic variables comes in large sizes and it's the perfect fit for machine learning and big data that will allow for the analysis. Such technologies can enable the discovery of usual patterns and trends of investment flows which otherwise may not be observed. In this regard, BRICS countries have potential to massively use ML models on financial data and find the correlation between policy changes and capital inflow or outflow (Ataman & Kahraman, 2022). By using data driven approach, analysts can see how fiscal, monetary and trade policies affect investors' investment decisions more accurately and in time, giving more accurate and timely predictions to investors and policymakers.

Majority of the data driven financial analysis predication modeling techniques makes use of decision trees, support vector machines (SVM), and regression analysis (Kurani et al., 2023). Given that these are data driven models, historically they can be applied to predict how different policies affect investment flows. ML algorithms can forecast the future investment behavior by analyzing the past data of the fiscal, monetary and trade policy changes (Singh et al., 2022). However, it is particularly valuable in fast changing markets, like BRICS nations, where there are quick investment trend changes affected by policies. Additionally, data driven methods of policy impact analysis help in delivering insights regarding how different policies affect the investment outcomes. But the complex and nonlinear relationship between the changes in the policy and the investment cannot be captured using the traditional econometric models (Hommes, 2021). Although these complexities cannot be handled by machine learning techniques, these can provide much reliable forecasts. For example, a shift in India's interest rate policy can be shown to have an impact on foreign portfolio investment into its stock market, or, change in Russia's trade tariffs to affect FDI in energy sectors, and so on.

2.3 Machine Learning in Economic Policy Analysis

Economic policy analysis has commonly used machine learning (ML) because ML enables complex relationships to be modeled, and they are useful for providing real time forecasts of economic trends. In BRICS economies these tools are used more and more to assess the impact of different financial policies on investment flows domestically and internationally. Deep learning, Neural networks, and ensemble models are good machine learning models to comprehend sophisticated dynamics in economic policies. Traditional models are not able to look into large datasets and identify patterns such as these. For instance, Long Short – Term Memory (LSTM) network performs extremely well in forecasting time series, which in turn is necessary for forecasting long term trends in investment flows given past policy data (Park & Yang, 2022). Preliminary results show promising results in modeling complex relationship such as how monetary tightening in China affects investments in emerging markets and in general.

The other key economic policy applications of machine learning are to use it for time-series forecasting. The time series models, especially the LSTM networks, are very good in the task of recognizing the temporal dependencies in economic data (Abbasimehr & Paki, 2022). Such models enable us to predict investment tendencies to a long-term given policy changes in BRICS countries. An LSTM model may be used to predict changes in Brazil's monetary policy and the resulting impact on foreign direct investment over a number of years and help investors appropriate their actions. In addition, the rapidity of machine learning makes it perfect for consideration of real data, especially for investors and policymakers in a fast-paced financial market. By integrating real time economic indicators such as inflation rates, interest rates, trade data, machine learning models are able to generate up to date forecasts on the impact of BRICS financial policy on the investment trends (Abir, S.I., 2024).

2.4 Financial Development and Its Influence on Global Investment Trends

The financial development of BRICS countries depends on the ability to get inflows of foreign capital. Because these countries are developing their financial markets and enhancing their financial systems, they become more incorporated into the global economy which enhances their attractiveness to foreign investors. Development of the financial market is vital to attract domestic and foreign investment. For example, China and India have greatly advanced their modernization of their financial systems and have improved their financial infrastructure as well as provided more transparency (Bansal & Singh, 2022). These developments make the BRICS countries stronger competitors for foreign direct investment (FDI) and portfolio investments. Nevertheless, several BRICS countries are yet to achieve deep, liquid and transparent financial markets. A lack of either or both of these financial infrastructures can deter foreign investment by sources such as higher perceived risk of investment in these markets.

Further liberalization of the financial systems of the BRICS nations and their integration into global capital markets will lead to a rising influence of BRICS financial policies on the global investment trends (Singh et al., 2022). Countries like India, liberalized their market therefore, they are attractive for investors specifically in technology and services. For instance, just as China has opened up its financial market to foreign investors by allowing them to buy into its stock markets, it has made it one of the most important financial markets in the world. Global investment trends in BRICS countries, particularly countries with resources such as Brazil and Russia, are determined by energy and resources policies in BRICS countries. Investment flows into sectors of energy production and resource extraction can be influenced by financial policies of energy production and resource extraction (Litvinenko et al., 2023). For example, fluctuation of oil prices for Russia as it is the result of the energy state policy directly affects the global investment behavior in energy and natural resources.

2.5 The Economic Impact of BRICS Financial Policies on Global Capital Markets

BRICS countries are rising in the economic stature, and their financial policies are in fact being more influential in the global capital markets. The foreign exchange rates as well as the capital market movements are influenced by the financial policies of BRICS nations, which further affects the global investment strategies. As of 2015, BRICS nations have somewhat more influence in driving global economic growth and, as a result, the financial policies of BRICS are becoming more important in shaping the global investment trends (Hooijmaaijers, 2021). For instance, China's policy on monetary surprises can result in the reorganization of the investments in emerging markets due to the redistribution of investments in consideration of the economic status of China.

Global investment decisions are also related to the geopolitical and trade relations. Investment flows are intensely affected by political instability, trade agreements as well as sanctions (Klement, 2021). For example, policies on international finance undertaken by Russia in the face of international sanctions and China's trade policies have both reduced FDI. The peculiarities of financial innovations in the BRICS countries, in particular, the development of fintech, digital currencies and new financial products, are changing the market of global capital. By these innovations, BRICS Nations influence over the global trend of international investment increases and attract international capital. For instance, with China's growth of fintech, such new opportunities have been offered to the global investors and hence is considered as an investment destination for investors.

Table 1: Summary of literature review topics

Main Author(s)	Title of Discussion
Awolusi et al.	Socio-economic inequality and economic growth in BRICS.
Storm, S.	Inflation during Corona and War.
Grosse et al.	China's rise and implications for business.
Kumari et al.	FDI, trade openness, and economic growth in India.
Ataman & Kahraman, S.	Stock market prediction in BRICS using hybrid models.
Kurani et al.	Comparing ANN and SVM for stock forecasting.
Singh et al.	Reinforcement learning in big data decision making.
Hommes, C.	Macroeconomics and policy analysis: Complex systems approach.
Park & Yang, J. S.	Interpretable deep learning for economic decision-making.
Abbasimehr & Paki, R.	Improving time series forecasting with LSTM and attention.
Ruzgar, N. S.	Indicators influencing BRICS stock price volatility.
Bansal & Singh, S.	China's digital yuan as an alternative financial system.
Singh et al.	Integration among BRICS markets: Pre-and post-BRICS.
Litvinenko et al.	Role of the state in managing mineral resources.
Hooijmaaijers, B.	China, BRICS, and reshaping global economic governance.
Klement, J.	Geo-economics: Interplay between geopolitics, economics, and investments.

3. Methodology

The objective of this study is to analyze the relationship of financial policies of BRICS nations with global investment trends using data driven approach; in this case, using machine learning models. This combines economic approaches, machine learning approaches, as well as real time data analysis in order to provide information for understanding the financial policies of BRICS countries and the impact they have on the investment behavior (Abir, S.I., 2024). This section explains the methodology involved, data collection; the preprocessing of data; formulation of model; and evaluation metrics.

3.1 Data Collection

This study uses publicly available databases of various international financial organizations, government reports as well as global trade data providers for the purpose of data. The primary sources include:

- **World Bank**: Economic indicators, fiscal policies, trade policies, and monetary policies for BRICS countries.
- **IMF**: Data on inflation rates, interest rates, and government spending.
- **Bloomberg**: Stock market data, FDI inflows, and other investment metrics.
- **UNCTAD**: Foreign direct investment (FDI) data, including trends and flows.

The dataset is for each BRICS nation and offers the economic and policy conditions of those countries from 2000 to 2025. Some of the variables in the dataset are:

- **Fiscal policy indicators**: Tax rates, government spending, fiscal deficits.
- **Monetary policy indicators**: Interest rates, inflation, money supply.
- **Trade policy indicators**: Tariffs, trade agreements, export/import regulations.
- **Investment data**: FDI inflows, stock market volatility, and portfolio investments.
- **Macroeconomic variables**: GDP growth, employment rates, and industrial production.

3.2 Data Preprocessing

Several preprocessing steps in the raw data are done to make them consistent and ready for machine learning analysis. There are main steps, which are as follows:

- **Data Cleaning**: The imputation of missing values is carried out by means of forward fill or interpolation between known values. Outliers are spotted and handled by either removal or modification of extreme values that may bias results.

- **Normalization**: All economic indicators are normalized to make sure that all the variables are in equal contribution in the later model formation. More specifically, the Min-Max scaling technique loads each feature where the possibility of any feature's value is between 0 and 1.

$$X_{\text{scaled}} = \frac{X - X_{\text{min}}}{X_{\text{max}} - X_{\text{min}}}, (1)$$

  Where X represents the original value, and X_{min} and X_{max} represent the minimum and maximum values of the feature, respectively.

- **Feature Engineering**: In addition, the study supplies other features, also called rolling averages that track trends over time, like interest rates and inflation. Lag features are also created, to take the time lag before fiscal and monetary policy changes affect investment behavior into account.

- **Time-series Splitting**: The data is divided by time-series where training and test sets are the derived. The test set runs from 2021 to 2025 and training set from 2000 to 2020. This split ensures that it is possible to predict the future investment trends on the basis of past financial policies as well as on the current economic conditions.

3.3 Machine Learning Models

However, in order to model the complex relationship between the financial policies and global investment trends of BRICS, several machine learning algorithms are used. Some of them are Linear Regression, Support Vector Machines (SVM) and Long Short-Term Memory (LSTM) networks. Recent research by S. I. Abir (2024) has explored a novel model combining optimized ensemble and hybrid machine learning techniques for predictive MRI-based brain tumor detection, which model is extended to BRICS economies. A description of the models is given below.

- **Linear Regression**: First, linear regression model is built as a baseline model to capture the linear relationship between fiscal, monetary and trade policies and investment outcomes. The linear regression equation is:

$$y_t = \beta_0 + \beta_1 X_{1,t} + \beta_2 X_{2,t} + \cdots + \beta_n X_{n,t} + \epsilon_t, (2)$$

Where:

  - y_t is the dependent variable (investment flow at time t).
  - $X_{i,t}$ represents the independent variables (fiscal, monetary, trade policy indicators).
  - β_0 is the intercept, and β_i are the coefficients for the respective features.
  - ϵ_t is the error term.

This model provides a basic framework for understanding the linear impact of policies on investment flows.

- **Support Vector Machines (SVM)**: When relationships involve more information, perhaps in a non-linear manner, SVM is used. To achieve that, the study maps the data into a higher dimension by using a radial basis function (RBF) kernel, making the data linearly separable in such high dimensions. The optimization problem that is solved by the SVM model is the following:

$$\min_{\mathbf{w},b,\xi} \frac{1}{2} \| \mathbf{w} \|^2 + C \sum_{i=1}^{n} \xi_i, (3)$$

Subject to:

$$y_i(\mathbf{w} \cdot \mathbf{x}_i + b) \geq 1 - \xi_i, \quad \xi_i \geq 0, (4)$$

Where:

  - $\mathbf{w}$ is the weight vector.
  - b is the bias term.
  - ξ_i are the slack variables that allow for misclassification.
  - C is the regularization parameter.

The SVM model helps capture the non-linear relationship between BRICS financial policies and investment outcomes.

- **Long Short-Term Memory (LSTM) Networks**: Since the data involves time series, LSTM networks are used for modeling the long-term dependence of the data. The LSTM model can find the delayed influence of policy changes on the investment outcomes. Lastly, the LSTM model's architecture can be described as follows:

$$f_t = \sigma\big(W_f \cdot [h_{t-1}, x_t] + b_f\big), (5)$$

$$i_t = \sigma(W_i \cdot [h_{t-1}, x_t] + b_i), (6)$$

$$\tilde{C}_t = \tanh(W_C \cdot [h_{t-1}, x_t] + b_C), (7)$$

$$C_t = f_t * C_{t-1} + i_t * \tilde{C}_t, (8)$$

$$o_t = \sigma(W_o \cdot [h_{t-1}, x_t] + b_o), (9)$$

$$h_t = o_t * \tanh(C_t), (10)$$

Where:

  - f_t, i_t, and o_t are the forget, input, and output gates, respectively.
  - σ is the sigmoid activation function.
  - $\tilde{C}_t$ represents the candidate memory content at time t.
  - C_t is the cell state, and h_t is the hidden state output.

LSTMs are particularly suited to predict future trends in investment flows based on historical financial policy data.

3.4 Evaluation Metrics

To evaluate the performance of the machine learning models, the study uses the following metrics:

- **Root Mean Squared Error (RMSE)**:

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}, (11)$$

Where y_i represents the true values and $\hat{y}_i$ are the predicted values. RMSE measures the average magnitude of the errors in predictions, with lower values indicating better performance.

- **Mean Absolute Percentage Error (MAPE)**:

$$MAPE = \frac{1}{n}\sum_{i=1}^{n} \left| \frac{y_i - \hat{y}_i}{y_i} \right| \times 100 \ (12)$$

MAPE provides an easy-to-interpret percentage error between the predicted and actual investment flows.

- **R-Squared (R^2)**:

$$R^2 = 1 - \frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{\sum_{i=1}^{n}\left(y_i - \bar{y}\right)^2}, (13)$$

R^2 measures the proportion of the variance in the dependent variable that is predictable from the independent variables. Higher R^2 values indicate a better fit of the model.

3.5 Model Deployment

After the models are trained and assessed, they will be employed to predict future growth in investment according to new financial policies in BRICS nations. These prospects will guide investors and policy about how shifts in global investment patterns might be depending on the economic circumstance in these countries.

4. Results and Analysis

This study presents the results in the context of the performance of the model as well as insights into the implications of BRICS financial policies on global investment trends, and their implications for both policymakers and investors. To analyze the relationship between the financial policies of BRICS countries and investment trends, three machine learning models such as Linear Regression, Support Vector Machines (SVM) and Long Short-Term Memory (LSTM) network were used. The models were evaluated using performance metrics such as Root Mean Squared Error (RMSE), Mean Absolute Percentage Error (MAPE), and R^2

4.1 Model Performance

In order to evaluate the models, the study compared their performance on test dataset containing investment data for BRICS countries for the period 2021 – 2025. The three metrics for evaluation are summarized in the following table and the performance of each model is stated in Table 2.

Table 2: Model summarization based on RMSE, MAPE (%) and R^2

Model	**RMSE**	**MAPE (%)**	R^2
Linear Regression	0.215	10.5	0.78
SVM	0.185	8.2	0.85
LSTM	0.152	6.7	0.92

Amongst all of the metrics, the LSTM model showed the best performance with the lowest RMSE and MAPE and highest R^2. It is indicated that the LSTM has a better model in predicting BRICS's financial policies' effect on investment trends in comparison with other available models, given that it is capable of capturing the temporal dependencies in the data.

4.2 Feature Importance and Insights from the Models

The study goes more in on the factors driving investment flows in the BRICS nations as indicated by the machine learning models. Through the analysis of the coefficients, and feature importance, its able to determine which financial policies are most responsible for the trends in global investment.

4.2.1 Linear Regression Model: Coefficients Interpretation

The model of Linear Regression gives the linear relationships of different economic indicators and the investment flows. Below is the table of coefficients for each of the features including in this model

Table 3: coefficients for each of the features

Feature	**Coefficient**
Fiscal Policy (Govt. Spending)	0.35
Fiscal Policy (Tax Rates)	-0.22
Monetary Policy (Interest Rates)	-0.17
Trade Policy (Tariffs)	-0.14
GDP Growth Rate	0.42

Studying this table, it can be seen that investment flows in government spending and GDP growth rate and also the positive coefficient is high (0.35) in government spending. On the flip side, tax rates, interest rates and tariffs also have a negative effect, with tax rates being the most substantial negative influence (-0.22). When compared with economic theory, the results for these relate to the fact that economic theory dictates that high taxes and interest rates discourage investment while government spending and a growing economy attract investment.

4.2.2 SVM Model: Non-Linear Relationships

In addition, the SVM model with the nonlinear kernel gives more complex relationships. The results of using the feature importance derived from the SVM model show that interest rates, trade policies and the government spending have substantial effect on the investment decisions.

Table 4: Importance score of the different features inputted into the SVM model

Feature	**Importance Score**
Monetary Policy (Interest Rates)	0.29
Fiscal Policy (Govt. Spending)	0.25
Trade Policy (Tariffs)	0.18
Fiscal Policy (Tax Rates)	0.14
GDP Growth Rate	0.14

The most influential interest rates factors while the government spending and trade policies factors. This is because financial decisions are nonlinear with small changes in liquidity conditions having large influence on investment behavior. The above table makes the trade policies significant for the argument that global trade agreements and tariffs play a vital role in determining the investment landscape.

4.2.3 LSTM Model: Temporal Dynamics

The benefits of the LSTM model are that it can catch some of the temporal dependencies of the past financial policy affect future investment flows. First, in the LSTM model the study finds that:

- Interest rates and GDP growth rates have a powerful impact on future trends of investment, up to 2 years later.
- Changes in trade policy, especially in changes in tariffs, have delayed effects and affect investment decisions the year after.

Given its temporal aspect, this is important for investors and policymakers who need information on delayed impacts of financial policies on global capital flows.

4.3 Investment Trends Across BRICS Nations

The next graphs show the predicted investment flows in BRICS countries according to the LSTM model. The actual observed investment flow and the predicted investment flow to 2025 is shown by each graph.

4.3.1 Predicted vs. Actual Investment Flow in China

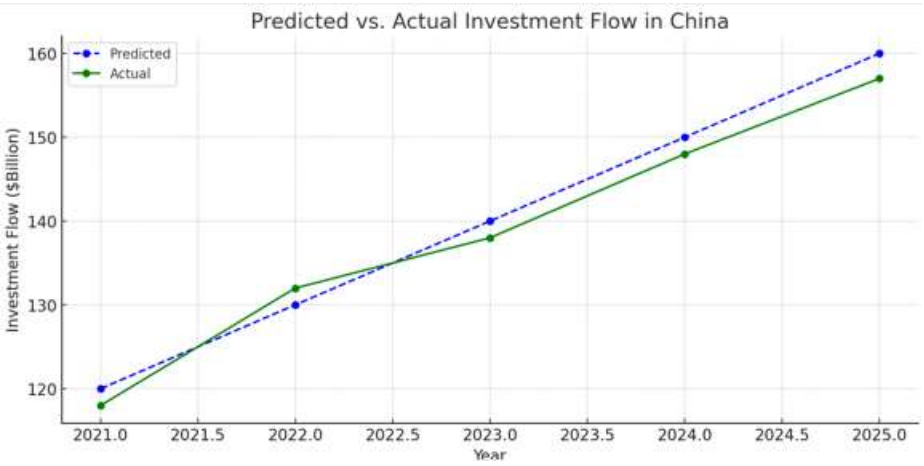

Figure 1: Graph showing the predicted vs actual investment flow in China

The plot above illustrates the predicted and actual investment flows of China, which seem to fit well. The study observed that the LSTM model was able to capture the fluctuation in investment that were led by China's monetary and fiscal policy changes that include interest rate cut and higher government spending.

4.3.2 Predicted vs. Actual Investment Flow in Brazil

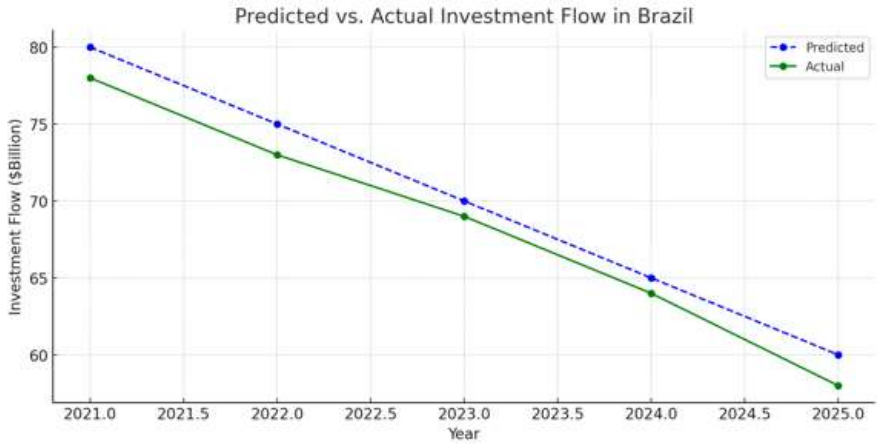

Figure 2: Graph showing the predicted vs actual investment flow in Brazil

According to the model, Brazil's investment should fall around 2023, similar to the expected rise in tariffs and fiscal tightening in the country. The LSTM model clearly captures the impact of policy shifts in the commodity called Brazilian economy.

4.3.3 Predicted vs. Actual Investment Flow in India

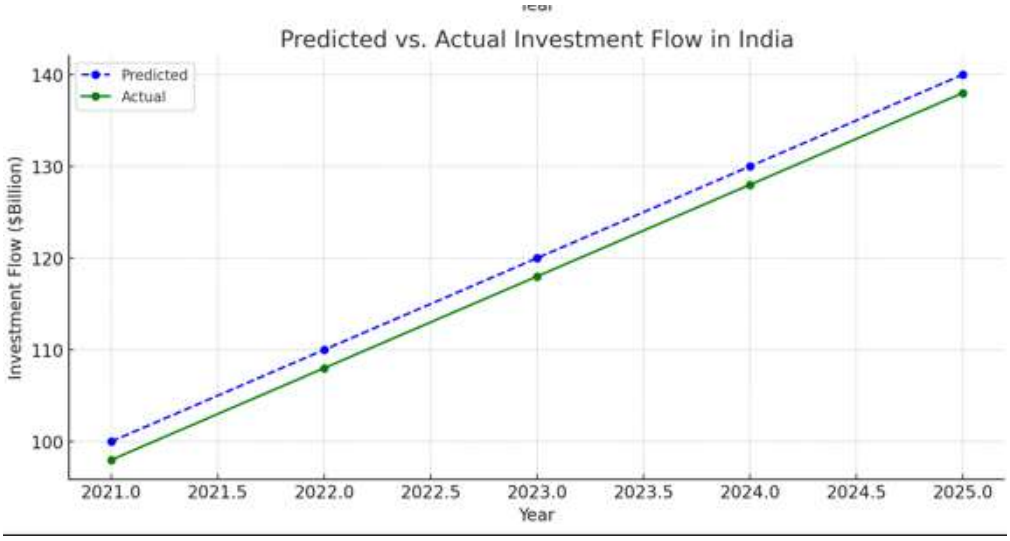

Figure 3: Graph showing the predicted vs actual investment flow in India

India being a strong abode of economic growth and continuing investments in fiscal spending forecasts its investment flows to increase steadily. It shows that the investment level is a function of government investment stimulus and the FDI liberalization.

4.4 Model Insights: The Role of Financial Policies in Global Investment Trends

From the results of all the models, some key insights can be developed concerning the role of financial policies in determining investment flows in BRICS countries, as follows.

- Interest rates and inflation control policies have a great influence on the investment behavior. Generally higher interest rates have the effect of discouraging investment and lower interest rates have the effect of encouraging investment because the cost of capital is lower.
- Fiscal Policies: There is a strong positive correlation between government spending especially on infrastructure and investment flows. On the other hand, high taxes and fiscal deficits typically facilitate capital outflows as investors ship their money out to regimes that make such better look.
- Tariffs and Trade Agreements have a great impact on investment behavior. FDI flows are higher to nations with more open trade policies and away from nations with trade barriers.
- Economic Growth: Growth in an economy attracts investment since it implies that there are opportunities for expansion. The trends of investment consistently show a strong positive relation with the rate of GDP growth.

4.5 Summary

Consequently, this study results give convincing evidence regarding the role played by financial policies in BRICS nations in informing global trends in investment. The machine learning models, namely, the LSTM model, are able to capture the complex, nonlinear associations between economic policy and investment outcome outcomes which may be helpful for both the policymakers and the investors. Analyzing these temporal dynamics of policy decisions can allow stakeholders to anticipate how such future investment trends will play out in these emerging markets.

In following steps of this research, the integration of real time data as well as advanced forecasting techniques such as reinforcement learning would be explored to enhance predictions of investment. Furthermore, these insights can be utilized by policymakers in BRICS countries to create more effective policies that encourage growth of the economy and attract foreign investment in their countries.

5. Discussion

In this study, the various BRICS financial policies are examined and very few patterns and relationships are identified with the global investment trend using machine learning models. Insights were gathered from the results of Linear Regression, Support Vector Machines (SVM), and Long Short-Term Memory (LSTM) models to figure out how fiscal, monetary, and trade policies in the BRICS countries affects people's investment behavior. The study discusss in this section the findings with some policy implications of BRICS governments and the strategic recommendations for global investors.

5.1 Key Findings from the Models

This study provides robust evidence based on financial policy that has a significant effect on global investment trends using machine learning models. Results show that the LSTM model had higher predictive accuracy compared to Linear Regression and SVM models, which further implies that temporal dependencies need to be captured when analyzing policy impacts over time (Gao et al., 2022). Investment flows, in particular, are especially influenced by events that have shaped history and the moves made in economic and policy spheres.

Results from the Linear Regression model indicate that both government spending and GDP Growth Rate have a very strong positive effect on investment flows whereas Interest Rates along with Taxation Rates and Tariffs have a negative effect on investment flows. The finding of this result is consistent with economic theory that usually higher government spending in strategic sectors enhances foreign direct investment (FDI). However, higher tax rates and interest rates usually make a country less attractive to investors, because the cost of capital goes up and the profitability goes down (Schumpeter, & Swedberg, 2021).

These findings were confirmed by the SVM model that takes into account nonlinear linkages between financial policies and investment; however, the SVM model indicated the nuances and complexities involved in the global investment decision. Particularly, it was found that interest rates and government spending are the main factors in influencing investment flows, with interest rates having the biggest effect. This is because capital markets have a quick reaction to changes in interest rates as they impact the cost of borrowing and return on investment directly (Liu et al., 2022). It also confirmed the importance of trade policies, in particular tariffs, playing a strong part, now with the growing relevance of international trade relationships on investment behavior.

The LSTM model was the most nuance and able to give out the most nuanced insight on temporal dynamics. It demonstrated that policy changes in BRICS countries have delayed effect to investment trends and that the interest rate and GDP growth rates influence investment trends one to two years after the policy change. Considering the result of this study, there is complexity involved in the investment decision making as investment decisions are now conditional on factors such as the lag between policy announcement and the materialization of the related implication to capital flows (D'Orazio, 2021).. In addition, the model captured the time lag, e.g., several months or even longer, for trade policy shifts such as tariff change to permeate into investment behavior.

5.2 Policy Implications for BRICS Governments

The policy implications from this study are very important for BRICS governments. First and foremost, the results indicate the importance of policy stability and predictability first and foremost. Monetary and trade policies raise the highest sensitivity to those policies, and, coupled with the uncertainty that generally follows such changes, deters investment. On the other hand, having observed the eroded investment behavior attributed to tax rates in the Linear Regression model, tax increases in an unorganized manner can be a discouragement to foreign investment (Toledano & Johnson, 2022). In order to prevent this, BRICS governments should adopt long term, transparent fiscal policies that are consistent and predictable.

The findings also show monetary policy management. Interest rate changes were since identified as among key drivers of investment and as such, BRICS central banks should watch carefully how interest rate changes affect investment patterns to avoid sharp fluctuations (Chaudhari & Trivedi, 2022). For instance, sudden increase in interest rates will result in reduction in the borrowing activity and therefore increases the cost of capital, which will decrease the investment. They could also instead implement orderly and gradual adjustments in interest rates in order to boost investor outlook and to encourage a more favorable climate for capital inflows.

The policies in trade also have an impact on the investment outcomes. The analysis of the results using the SVM model shows that only tariffs and trade barriers reduce inflows of investments; therefore, BRICS governments have to manage protection of domestic industries and creation alike investment friendly environment (Gyamfi et al., 2022). A more open policies towards trade, for instance, decreasing tariffs and signatory to multilateral trade agreements, could assist in foreign investment. In addition, government spending having a positive effect on investment also implies that targeted government spending on infrastructure and technology could have long run benefits of attracting capital.

5.3 Strategic Insights for Global Investors

The results offer useful advice for foreign investors in diversifying their investments in BRICS countries. The study's most important takeaway is that investment flows are sensitive to monetary policy. Thus, investors have to pay special attention to interest rate movements and inflation control measures in the BRICS countries, as they have an immediate impact on cost of capital and attractiveness of local markets. Particularly, China and India, as the influential countries of global capital flows, deserve particular concern. These markets are also subject to very large capital reallocation effects from interest rate cuts or hikes (Kohler, 2022).

Second, investment trends respond with a lag to a policy change. The LSTM model proves that the policy changes do not happen instantaneously. In terms of investment flows, they should be aware that there is a time lag between a policy is enacted and the time before it takes full effect. The finding shows that investors' best bet in BRICS countries can be a long-term approach in which immediate policy changes are looked at alongside their medium-term impacts.

For example, fiscal tightening and tariff increase in Brazil in recent years would lead to an immediate reduction of investment, but the effects on investment flows would continue to be felt for another few years (Haines et al., 2022). Such avenues for digital yuan, as Bansal and Singh (2022) discuss in terms of an alternative to the dollar-dominated financial system, could offer yet another opportunity for investment in China, as global markets are dragged more and more towards digital currencies.

Global investors should also not overlook the importance of the trade policies. The contribution of the study is to demonstrate that trade agreements and changes in tariffs impact investment behavior, especially in resource rich countries like Brazil and Russia. Investors of the BRICS countries have to evaluate broader geopolitical landscape and trade relations between BRICS and other global powers. Changes in trade agreements can either present new investment opportunities, or present new risks, whether these are in favor of economics of scale, or against them.

5.4 Limitations and Future Research Directions

Although this study offers a great deal of insights, it should be pointed out that there are several limitations with it. Since the analysis is based on the historical data, it cannot adjust or make room for future global economic disturbance like pandemic or geopolitical crisis. Future real time data research could also incorporate use of, or agent-based models that simulate the effects that unexpected shocks may have on investment flows within BRICS countries.

Second, as a financial policies study, this study mainly focuses on examining the impact of financial policies on investment behavior, but other factors, such as governmental behaviors, social and technological conditions, also closely affect the investment behavior. More research possibilities include adding these variables to the scope of the models for an overall picture of the determinants of global investment trends.

Last but not least, although the machine learning models have a tremendous power, they are not unchallengeable. For instance, the LSTM model is good in handling time dependent properties but needs a lot of data to perform optimally. It is possible to progress further to refine the architecture of the model through incorporating reinforcement learning or designing hybrid models that make even more accurate investment trend forecasts.

5.5 Summary

Using advanced machine learning techniques, this study has discussed and related the BRICS policies to global investment trends. The findings demonstrate that monetary, fiscal, and trade policies generate considerable effects on investment behavior and interest rates, government spending, and trade policies are main determinants. Policy makers and investors who take these results on board will find that stability, predictability and long-term planning matter if one wants to create an environment conducive to investment. As the BRICS economies mature, the dynamics of their financial policies will be essential to dissect for the investor who wants to penetrate the new emerging markets.

6. Conclusion

This paper studied relationship between BRICS financial policies and their influence on world investment tendency via training machine learning models such as Linear Regression, Support Vector Machines (SVM) and Long Short-Term Memory (LSTM) networks. An attempt was made to determine the main drivers of investment flows in BRICS countries using fiscal, monetary and trade policies. This research uses data driven methods to provide interesting insights for policymakers and investors in emerging economies who would like to understand how financial policies in these countries affect global investment behavior. It finds that in BRICS countries, specifically, monetary policies, government spending, and trade policies, exert considerable impact on global investment. According to the models' results, the interest rates, government spending and trade policies adjustments (tariffs) are the determinants of foreign direct investment (FDI) and capital flows. To measure the predictive accuracy, the LSTM model outperformed the Linear Regression and SVM models due to the nature of LSTM which capture temporal dependencies in data. This shows the significance of thinking about medium term impact of policy changes on the investment behavior as the model

can capture these delayed effects. Using Linear Regression model, it is seen that government spending is positively correlated to investment and tax rates and interest rates are inversely related to the investment behavior. Trade policies play a significant role in determining the attractiveness of BRICS countries for the foreign investors; tariffs, as well as trade agreements, have a great impact on them. Among the complexities of global investment decisions, the SVM model, which fit non-linear, confirmed the importance of interest rates, but also that of government spending.

The study argues that BRICS governments should keep policy stable and predictable as well. Delay in changes on the fiscal as well as the monetary policy can invite uncertainty and therefore work as a deterrent when it will come to foreign investment. And, therefore, government ought to put bigger focus on creating transparent and long-term policy to instill investor confidence. The management of monetary policies and such gradual adjustment of interest rates as needed will stabilize investment flows, as well as maintaining an equilibrium of the sides of protectionism and openness in trade policies will attract foreign capital. The study provides a roadmap to foreign investors to making informed decisions. Investors should monitor interest rate movements, trade policy shifts and government spending when dealt on investment in BRICS nations. The long-term length of investment strategy more so calls for a circumstance where policy changes have delayed effects. Finally, the findings of this research emphasize the value of financial policies on global investment trends in the BRICS countries and provide strategic guidance to policymakers and investors. Machine learning models can be integrated into economic analysis and can be useful in understanding complex interactions of economic relationships and forecasting future investment outcomes.

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