

## **Role of FDI and Foreign Remittances in Boosting Economic Growth: Evidence from Brazil**

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### **Abstract**

The paper has two main objectives; (i) Firstly, to investigate the relationship between economic growth and economic indicators of Brazil economy, (ii) Secondly, to examine the impact of FDI on Gross domestic product of Brazil economy. The study employed time series data from 1986 to 2014 of the remittance, FDI, capital formation and domestic savings to know the impact on Gross domestic product of Brazil. The paper analyzed the growth and economy nexus by applying econometric models such as Granger causality test, OLS methods and unit root test (both ADF and PP). According to empirical estimations, foreign remittances and capital formation have significant and positive contribution towards economic growth for Brazil. However, foreign direct investment and savings show insignificant response towards gross domestic product of Brazil economy. The Brazil economy needs massive reforms to properly utilize the foreign and domestic investments on industrial, agriculture, and technology sector. In addition, the capital formation is playing an important role in the economic development due to positive impact on economic growth. The study proposed some fruitful policy implication for Brazil to boost the economic growth and living standard of people.

**Keywords;** Foreign Direct Investment, Foreign remittances, capital formation, Brazil, Economic growth

### **Introduction**

Gross domestic product (GDP) is considered as basic sign to measure the strength of each country's domestic economy. It characterizes the total dollar worth of all goods and services created in a defined time, which is considered as the size of economy. GDP measures are used to quantify the economic performance of a country or region, but can also consider as a measure, which amounts for the relative contribution of industry in economic progress of a country. In recent years Global economic scenario has witnessed the significance of FDI which has helped developing countries in making economic strides and as a result GDP has improved over the years. Economists credits FDI as a growing phenomenon, deemed as a pillar for economic progression for every country regardless of their development level. Investment level in the abroad economies has risen 6 times since the cold war. Such level of investments has attracted interest regarding the ever growing debate of FDI and economic progression in the host country (Muhammad Arshad Khan, 2007).

In order to be recognized as an economic force FDI depends upon number of variables, which strengthen its impact upon economic strength. Such variables are banking system, govt policies, market situation and growth in the financial sector. In the last three decades Brazilian economy has witnessed significant basic reforms, initiated by Plano Real in 1994 followed up by Institutional reforms. Implementation of Plano Real helped Brazil become an attractive market of FDI. Such was

the effect of these policies that inflation rate which stood at 5000% in 1994 was brought down to single digit in 2001(IMF Financial Statistics). The solution to hyperinflation was the most distinction, which helped create opportunities in every economic sector, rather than selected ones. World economic forum conference 2008 ranked Brazil as 2<sup>nd</sup> most favored country in South America,

In 2008 UNCTAD <sup>1</sup> reported that Brazil was fourth highest recipient of foreign investment after china, Hong Kong and Russia. These facts were as per expectations of investors as large population providing labor force in great numbers and the stability in institutional reforms along with performance of local industry in greater exports in recent years. Hence the dependence upon foreign investment has increased in recent years by the Brazilian economy. Brazil is part of BRIC's (Brazil, Russia, China, India) and prominence in Latin American economic market, inflows of FDI is becoming more significant topic in respect to Brazil.

The research work attempts to examine the significance of various indicators to determine the greater inflow of FDI in Brazil. By using empirical data from (1986-2014), we argue that changes in Brazilian economy are owed to domestic factors such as trend in savings, domestic capital formation and remittances, rather than country and exchange risk. The rest of research paper includes the next section where we review relevant literature, followed up by research hypothesis, then research methodology is explained, and last section of the study includes results and discussion of findings.

### **Background Literature**

In recent years, primary focus of a huge magnitude of research studies is concentrating on the aspects that facilitate the flow of foreign capital into host nations' manufacturing and various sectors of emerging markets. While other empirical research studies have analyzed the general socio-political indicators like as opacity index (Hooper and Kim, 2007). Some studies also pointed out the relationship between transparencies in institutional level reforms to FDI Inflows. Egger and Winner, (2005) analyzed positive linkage between FDI and corruption, while examining data of 73 countries ranging from 1995 to 1999. Asiedu, (2001) suggested that each world region has different factors for higher level of foreign inflows of capital. Her research indicated that return on capital and development in basic infrastructure are key in respect to positive relationship, while data analysis of other African region indicated no relationship of these variables for economic growth. Developing economies also indicated that openness to trade varied greater influence towards increased inflows of FDI in developing economies as compared to African economies.

Chen, Chang, and Zhang, (1995) analyzed impact of FDI on Chinese economy to post Mao-zay tung regime by attending the situation of different demographics, development and size of foreign money invested. And concluded positive relationship because of FDI, which enables the positive impact on savings culture. And this benefit further sharpens the economic growth. This positivity further accelerates the other areas of Chinese economy. In other words, it channels the industrial progression into different modes, which further facilitate its rapid impact in more of beneficiary transformation. Foreign investment has been widely considered as the most efficient and smooth way to transfer technological developments, Man-management skills and market infrastructure resulting in being considered favorable for economic prosperity in the host nation Khan, (2007). Kim and Seo, (2003) investigated the impact FDI had on domestic investor's decision to invest after investment from foreign countries. Findings of the research concluded that FDI played positive role in deployment of local investment and in the economy's road map. Other studies analyzed variables

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<sup>1</sup> United Nations Conference on Trade and Development

like as market dynamics in emerging markets like as phone density index exports along with the country risk (Cardak and Moosa, 2006), while paying focus to impact on host countries or indirect effect on competing economies for greater influx of FDI (Garcia-Herrero and Santabarbara, 2007). Likewise, Frenkel et al., (2004) added indicators related to countries who are investing to determine the key factors of wealthy countries FDI in economies like Brazil. Hsiao and Hsiao (2006) examined data of far east Asian economies of Taiwan, Malaysia, Philippines, Singapore, Korea and China ranging 1984 to 2004 to examine causality analysis between exports and GDP along with volume of FDI invested in these economies.

Turkean et al. (2008) further explored the linkage of host economy and FDI's inter-crossing relationship by declaring them endogenous variables. Findings indicate the relationship is positive in nature and impact can be enhanced, if proper measures are taken by the host economy. Linking both the aforesaid lines of study, Bengoa and Sanches-Robles (2003) highlighted the data of eighteen Latin American countries over the period of 1970-1999 concluded that freedom and economic reforms are key factors of FDI's greater impact and market growth is greatly affected by foreign direct investment. Likewise, Mixon and Trevino (2004) recognized the domination of the effects of institutional environment economies like Brazil, Argentina and Chile by examining FDI by MNC's in these countries

Some research findings are categorized by a larger theoretic concentrate, thus contribute to the theory of development for any economy of foreign direct investment. By using theories from behavioral economics, Hosseini (2005) discovers the importance of foreign direct investment on the improvement in economics of nations, and how to model that foreign direct investment can be examined. Basu and Guariglia (2007) conducted theoretically the relationships between foreign direct investment, economic growth and inequality, by applying data of 119 developing countries, and indicated that foreign direct investment could yield inequality as well as growth, which in the end could decrease the standing of agriculture to the GDP of the beneficiary nation.

In comparison to the number of comparative findings of foreign direct investment beneficiary countries, work like as Sun et al. (2002) emphasized on internal elements of a country to classify the determinants of foreign direct investment. For that case, the temporal and spatial variation in the determinants of foreign direct investment across several regions of China was considered, and the results showed that a negative effect of foreign direct investment flows and gathered foreign direct investment on domestic investment.

This research tries to implicate the variables, which are part of economic growth model, gross domestic savings, capital formation, foreign remittances and FDI and their relationship on host nation's economic growth model. We do comprehend that they are differences in what is considered as FDI, investment etc. Nonetheless the data is taken from publications of World Bank and research institutions from research institutions and hence carry greater consistency for comparisons at global level.

### ***Trends of foreign investment in Brazil***

Plano Real, a plan implemented in 1994 to curb the issue of hyper inflation, which plagued the nation throughout the 1980's and 1990's. Although it was helpful to reduce the inflation rates from 5000% to under 10%, it did result in:

- (1) Greater dependence upon imports without focus on exports
- (2) Severe fiscal crisis- resulting in growing external debt for the country

A progressive decline of the cambial anchor as an elementary tool of economic policy followed. After implementation of Plano Real, financial market witnessed major crises in Mexican 1994 and 1998's Russian crisis, each of these contributed in negative volume of FDI in progressive nations (Giambiasi, 2005) and ultimately Brazil oversaw nominal GDP growth rate of 2.8 per cent

(de Paula and Ferrari-Filho, 2003). Although the economic growth of Brazil was approximately 7 percent after World War II till early 1980's (Bonelli and Bacha, 2005), but it was possible due to exchange rate stability and short-term investments, which pursues to yield benefit of the variances between exchange rate and interest rates. As a matter of fact, the interest rate on investment was responsible for 60 % of inward FDI in Brazil. In addition, during the era of institutional and macro-economic reforms to attract capital inflows, the country mainly focused on: denationalization, reorganization of the financial structure, reforms in social security, rescheduling of state debt; creation of supervisory watch dogs for public institutions and on nominal level of inflation. Giambiasi, (2005) argued that the reforms directed to higher inflows of FDI into sectors such as; banking, financial and insurance services (Trevino and Mixon, 2004).

After the year 2000 and in the era of after nine eleven, the inability of fiscal tightening has combined with the requirement to create surpluses to reimbursement of debt, which further resulted in higher short-term interest rates. Consequently, it resulted in negative impact on the average income levels and end user market growth in Brazil. The post nine eleven era oversaw the Brazilian consumer market respond in positive manner as higher volume of credit and higher level of foreign exchange reserves; and with inflation under control, market growth again returned to realistic targets. The post plan real period of 2000-2007 deals with a appropriate setting for analysis of the influence and dynamics of financial market and the determinants of FDI in Brazil.

## **Research Methodology**

### ***Data Overview***

The paper used the data for FDI, capital formation, domestic savings, Gross domestic and remittance on the Gross Domestic Product (GDP) for Brazil for the time 1986 to 2014. The data was accessed from World Development Bank<sup>2</sup>, (2017), a complete comprehensive and accurate database for economy related factors. The paper used the data to empirically examine the impact of FDI, capital formation, domestic savings, Gross domestic and remittance on the economic growth (GDP) of the Brazil Economy. The findings of the study are explained in Result and Data analysis and results part. The important variables of the study are explained as under.

### ***Economic growth***

Economic growth implies an increase in production or capital per capita. If the production of goods or services is increased by any reasons in a country, we can say that economic growth has taken place in that country. Trade is the transfer of ownership of goods and services from one person to another person for the receipt of something from the buyer. In general, any business that a person gives up against a good or service and both are satisfied with that act is trading.

### ***Foreign Direct Investment***

The foreign direct investment inflows can play an important role by enhancing and expanding the supply of funds for domestic investment in the host countries. This could be done from side to side the production chain when foreign direct investors buy locally made inputs and sell intermediary inputs to local enterprises. In addition, inward foreign direct investment can boost the host country foreign exchange earnings and exports capacity and also foreign direct investment can boost technology transfer, encourage the creation of new jobs and enhance overall economic growth in the host countries (Belloumi, 2014).

During last decade, the relationship between foreign direct investment and economic growth has received the major attention from many researchers, economists, and policy analysts specifically

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<sup>2</sup> <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#>

in developing countries. (Nistor, 2014; Pegkas, 2015; Makiela and Ouattara, 2018). It is important to know if foreign direct investment inflows surely produce economic growth and if a country has higher GDP rates attracts more foreign direct investment inflows Simionescu, (2016).

#### *Workers' Remittances*

The present study used the works living abroad as workers remittances. As a matter of fact, the workers remittance is very important for any economy specially for developing and emerging economies such as Brazil, India, Russia etc. (Buch & Kuckulenz, 2004).

### **Methodology**

The following statistical tests are used in this research paper.

1. First generation Unit root tests such as (ADF and PP)
2. Ordinary Least Square
3. Granger Causality Test

Based on research objectives, the paper developed the following model for ordinary least regression analysis.

$$\ln GDP_i = \alpha + \beta_1 \ln FDI_i + \beta_2 \ln REM_i + \beta_3 \ln SAV_i + \beta_4 \ln GCF_i + \varepsilon_i \quad (1)$$

Whereas, LnGDP shows gross domestic per capita, LnFDI shows foreign direct investment inflows, remittances highlight the foreign remittances for Brazil. In addition, lnsav, presents the annual savings and LnGCF shows gross fixed capital formation, a proxy for domestic investments.

The beta coefficients of respective variables show the relevant change in the economic growth from explanatory factors. In the specified model lnGDP (Gross Domestic Product) is dependent variable while lnFDI (Foreign Direct Investment), lnREM (Foreign Remittance), lnSAV (Savings) and lnGDCF (Gross domestic capital formation) are used as explanatory variables. The Research hypotheses are explained as under:

H<sub>1</sub>: Foreign Direct Investment contributes positively for economic growth.

H<sub>2</sub>: Foreign Remittance helps to boost the GDP of Brazil.

H<sub>3</sub>: Savings has significant positive impact with GDP

H<sub>4</sub>: Capital Formation has positive relation with GDP.

### **Results and Discussion**

#### *Stationary Test*

The reliability of the time series data can be checked by applying different unit root tests. As a general rule, the data should not have unit root problem, if the time series data have unit problem then the results will be invalid. To check the stationary of the data unit root test has been applied. To check the stationary of the data augmented dickey-fuller test and Phillips-Perron unit root has been used. The Null hypothesis is that the variable has unit problem and data is non-stationary. The alternative hypothesis is that the data is stationary. We used first generation unit root tests (such as Augmented Dickey-Fuller test, Phillips-perron Unit root test) to check the stationarity problem in time series data. If data is non-stationary, then the results will be invalid. If t-statistics (t\*) > ADF critical value, we fail to reject null hypothesis, i.e., unit root exists (variable is non-stationary).

If t-statistics (t\*) < ADF critical value, reject null hypothesis, i.e., unit root does not exist (variable is stationary). Same in the case of Phillips-perron Unit root test:

If t-statistics (t\*) > PP critical value, we fail to reject null hypothesis, i.e., unit root exists (variable is non-stationary).

If t-statistics (t\*) < PP critical value, reject null hypothesis, i.e., unit root does not exist (variable is stationary).



**Table 1: Estimates for unit root**

Variable	ADF Test static (with trend and intercept)		P-P test (with trend and intercept)	
	Level	First difference	Level	First Difference
GDP (LGDP)	-2.28744 *	-3.330622 *	1.853940 *	-3.330622 *
FDI (LFDI)	-2.312378 *	-5.322137**	-2.312378 *	-5.361955 **
REM (LREM)	-1.829648 *	-3.778641*	-2.195915 *	-3.731572 *
SAV (LSAV)	-3.378730 *	-2.959340 *	2.118584 *	-2.648728 *
GDCF (LGDCF)	-2.126240 *	-3.875663 *	-1.1913123 *	-3.874747 *

Note: \*, \*\*, \*\*\* represents the level of significance at 10% ,5% and 1% respectively.

At the level with intercept, the computed ADF test-statistics -2.28744 is less than the critical values at 1%. And as well as on its first difference value. It means the GDP variable has not unit problem. And the data is stationary. So, we reject the null hypothesis in the case of GDP. In augmented dickey-fuller test all the independent variables (FDI, REM, SAV, GDCF) are significant at 1%. So that we reject the null hypothesis, it means all the variables are stationary as per augmented dickey fuller test.

At the level with intercept, the computed P-P test-statistics 1.853940 is less than the critical values at 1%. And as well as on its first difference value. It means the GDP variable has not unit problem. And the data is stationary. So, we reject the null hypothesis in the case of GDP. In Phillips-Peron test all the independent variables (FDI, REM, SAV, GDCF) are also significant at 1%. So that we reject the null hypothesis, it means all the variables are stationary as per Phillips-Peron test.

#### **OLS Regression**

Table 3 explains the regression analysis conducted in Eviews 9. The R Square Value is 0.9915 which shows that the model is accurate. The P value or significant value of remittance and capital formation is less than 0.05 which means that these two variables are significant, and they have relationship with GDP of Brazil Economy. The Significant value of foreign direct investment and domestic savings is greater than 0.05 which means that these variables are insignificant, and they have no relationship with GDP of Brazil Economy. The empirical estimates for remittances and capital formation are statistically significant and positive, indicating that remittances and capital formation contributes positively to boost the economic growth for the case of Brazil. The empirical estimates illustrate that the remittance and capital formation are positively relationship with GDP whereas, the foreign direct investment and Domestic Savings have no relationship with GDP of Brazil economy, as these variables are statistically insignificant.

**Table 2. Result of OLS regression**

Variable	Coefficient	p- Value
C	-6.213788	0.0000
FDI	0.029132	0.2164
Remittance	0.083181	0.0277
Savings	-0.015771	0.1158
Capital formation	0.828816	0.0000
R-Squared	0.991540	3.665184
Adjusted R-Squared	0.990129	0.255979
S.E. of regression	0.025432	-4.350057

Variable	Coefficient	p- Value
Sum squared reside	0.015522	-4.114317
Log likelihood	68.07583	-4.276226
F-statistic	703.1829	1.555871

### *Granger Causality Test*

The granger causality test was applied in Eviews 9. The Granger Causality concept explains the cause relationship of variables. It can be explained as if the single variable granger causes the other variable it means that the past values of these variables help to predict the future values. The Granger causality table below shows the positive results that are required from time series data. If the P value is greater than 5% then we reject the null hypotheses. In this test The Null Hypothesis can be as:

**Table 3. Empirical estimates for Granger Causality test**

Causality	F-Statistic	P-Value	Causality	F-Statistic	P-Value
Foreign direct investment does not Granger Cause economic growth	0.00100	0.9990	Remittance does not Granger Cause GDP	0.85374	0.4394
GDP does not Granger Cause FDI	1.64879	0.2152	GDP does not Granger Cause Remittance	0.17780	0.8383
Savings does not Granger Cause GDP	0.49357	0.6170	Capital formation does not Granger Cause GDP	0.53368	0.5938
GDP does not Granger Cause savings	0.77953	0.4709	GDP does not Granger Cause capital formation	0.58845	0.5637
Remittance does not Granger Cause Foreign direct investment	3.34122	0.0541	Savings does not Granger Cause Foreign direct investment	11.0760	0.0005
Foreign direct investment does not Granger Cause Remittance	6.05932	0.0080	Foreign direct investment does not Granger Cause savings	0.77670	0.4721
Capital formation does not Granger Cause Foreign direct investment	1.40362	0.2669	Savings does not Granger Cause Remittance	6.36640	0.0066
FDI does not Granger Cause Capital formation	0.10398	0.9017	Remittance does not Granger Cause Savings	5.42790	0.0121
CAPITALFORMATION does not Granger Cause Remittance	0.16420	0.8496	CAPITAL_FORMATION does not Granger Cause savings	0.47923	0.6256
Remittance does not Granger Cause Capital formation	2.78351	0.8496	Savings does not Granger Cause Capital formation	0.25266	0.7790

H<sub>0</sub>: The FDI Does Not Granger cause GDP.

Different Statistical Tests like Granger-Causality Tests, Phillips-Peron Tests and OLS Regression were applied in Eviews for the years of 1986-2014. Gross Domestic Product (GDP) was constituted as dependent variable, and FDI, and gross domestic savings, worker's remittance and

gross domestic capital formation were taken as independent variables. Empirical results show that all independent variables influence Gross Domestic Product, but they haven't impacted in the same way. Research results indicate that we accept the findings of domestic capital formation and remittance as these are significant and they carry positive relationship towards GDP, while on the other hand foreign direct investment and domestic savings don't show any relationship towards Gross Domestic Product, as these are insignificant as per regression results. Two Hypotheses are accepted ( $H_2$  and  $H_4$ ) and two hypotheses ( $H_1$  and  $H_3$ ) are rejected.

In this research we explored FDI and its impact in recent development projects in Brazil. The study focused upon pre and post plan real era, which oversaw great deal of improvements in domestic Latin American projects. For this purpose, we chose the time of 1986-2014 to account for accurate analysis of FDI. Based upon further analysis of BRICS and emerging South American markets, we further identified sub factors responsible to further enhance the impact of foreign direct investment. In the Brazilian economy's scenario, we tried to isolate contributing factors of FDI from percentage of domestic savings, gross domestic capital formation and remittances from abroad. Empirical findings of the study supported the fact that higher trend in domestic savings is a major contributing factor in enticing growth in domestic market along with domestic capital formation. Though we cannot ignore the role of FDI but due to nature of domestic market in Brazil, there is empirical evidence that its effect is becoming less significant as domestic factors are contributing in higher standards as compared to FDI. This research work carry weigh for theoretical perspective to further understand the role of FDI as well as implications to improve policy making decisions. In this research micro economic variables as well as macro-economic variables were included to further explore the dimensions of FDI. It is generally feasible that exchange and inflation rate are deemed as most influential factors for lesser stable economies, in case of BRICS countries, MNC's might pay more attention to internal market growth, which leads to greater utilization of resources to facilitate economies of scale.

### **Conclusion and Recommendations**

The remittance and capital formation can be viewed as important stimulus for Brazil economy. Mostly the Foreign direct investment shows the positive relationship on the GDP of all countries and specifically in the case of developing countries. But in the Brazil economy the FDI is not showing any positive trend on GDP of the Country. The Foreign direct investment brings prosperity, jobs and technology for any developing nation, so Brazil should focus on foreign direct investment. To boost the workers remittances Brazil government, adopt the measures to boost the human resources quality and adopt the policy to bring the Brazil overseas workers and nonresident Brazil's money throughout proper channel so that those remittances could be used according to the national plan. The domestic savings should be used carefully as per needs and structural adjustments so that in long run Brazil can improve their economic growth and bring stability in the country.

The growth in Brazil economy can be enhanced by improving remittance, capital formation and foreign direct investment. The growth should come with quality of human capital, institutions, infrastructure, good governance, communication technology and legal framework. Brazil should focus on these packages to increase the economic growth in long term planning. We do acknowledge that findings of this research cannot be generalized unless emerging markets with similar characteristics are validated by empirical data and a a lot of attention should be paid to further differentiate developing economies from developed economies as well as FDI determinants along with variants in emerging markets.



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