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Foreign Inflows and Economic Growth of BIMSTEC: A GMM Approach

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Abstract: The study is an attempt to test the influence of foreign capital inflows on BIMSTEC nations' economic growth of BIMSTEC nations during the time 2010-2021 by employing the one-step system GMM method. the data has been taken from WDI, 2022. The outcomes revealed that remittances, FDI, and inflation have an adverse influence on growth whereas debt, openness to trade, population, and aid have an optimistic influence on economic growth. The impact of population, remittance, and foreign is found statistically significant whereas the remaining variables have an insignificant impact. This led all the BIMSTEC countries should revise their policies and strategies regarding openness to trade, usage of external debt, and foreign aid. Various growth theories found foreign inflows an important factor for economic growth. Further accelerating these nations' economic growth will include the adoption and implementation of sound policies, the identification and removal of internal and external hurdles, and other related activities.

1. Introduction

Foreign capital flows have an impact on both developed and developing nations' economic growth. While developing nations require it for expansion and investment, developed countries need it for sustainable development. FDI is a substantial source of funding for emerging nations' development (Singh, 2022). It helps to assist capital formation, technology transfers, trade integration, and create a fair and competitive market, etc. Other than FDI, foreign aid also flows from developed nations to developing countries to fill the three gaps: fiscal gap, savings, and investment gap, and forex gap. Also, countries depend upon borrowings from other countries and international financial institutions to fulfilling the gap between government spending and revenue (Singh, 2022, Nayak *et al.*, 2023; Singh *et al.*, 2023).

Many developing nations generally face a shortage of capital, which can be seen in their individual import-export gap, foreign exchange gap, and savings-investment gaps. In developing nations, three gaps are found mainly: the foreign exchange gap, the savings-investment gap, and the fiscal gap (Bacha, 2011; Bharti and Nisha, 2021). They require an inflow of foreign capital to fill this gap (Bacha, 2011; Singh, 2022, Singh *et al.*, 2023; Vandana and Singh, 2023). So, these countries open up their economies to fulfill the need for capital for various purposes. Foreign capital raised by developing and underdeveloped nations can be in the form of FDI, foreign aid, external debt, FPI, remittances, etc.

Remittances have both direct and indirect impacts on the growth of the recipient nation (Sridi and Guetat, 2020; Ziesemer, 2012). The optimistic impact of remittances can be in the form of an increase in investment and availability of credit whereas a negative influence can be in the form of extravagant spending and disheartening saving (Verma *et al.*, 2021; Saini and Ravinder, 2022).

Developing nations, which have limited savings and income, rely on external debt to fund their initiatives. It leads to rising debt service obligations, which causes the amount of foreign debt to increase and become a burden and a constraint on the developing nation's growth. (Ayadi, 2010). External debt can have both positive and negative impacts on the economic growth of a country. It has an affirmative influence when it is used for developmental purposes such as infrastructure and has a negative influence when used for consumption purposes. If it is used for consumption purposes, it doesn't benefit the government and increases the burden of debt on the government (Tamimi and Jaradat, 2019; Verma *et al.*, 2021).

Foreign aid can be defined as "Government assistance aimed at advancing the welfare and economic growth of emerging nations. Aid can be given directly, from donor to recipient, or it might go through a multilateral organization for development, like the World Bank or the United Nations. Grants, "soft" loans (where the grant component is at least 25% of the total), and the provision of technical help are all examples of aid". Foreign aid may be for different purposes such as education, water supply, development of transport facilities, various services (banking, insurance, energy projects), various industry development projects, tourism, and trade, etc. According to theories of development and empirical evidence regarding developing nations, foreign aid fills resource gaps by increasing limited domestic savings, providing additional foreign aid needed to finance capital requirements as well as imports, assisting with the development of human capital, and boosting domestic capacity (Verma *et al.*, 2021; Singh, 2022, Singh *et al.*, 2023).

For boosting economic growth and expansion of trade and investment, many Asian countries tied up in various regional groups. Similarly, the BIMSTEC group was established in June 1997 as a result of the Bangkok Declaration. BIMSTEC was originally known as BIST-EC and consisted of Bangladesh, India, Sri Lanka, and Thailand. But now in BIMSTEC, there are seven countries.

BIMSTEC is performing well when compared to many regional groups such as the EU, TTIP and SAARC, etc. in attracting remittances in the last few decades. BIMSTEC is also attracting a heavy amount of foreign flows in the form of remittances (WEO, 2022). In comparison to many other regions throughout the world, the region is growing as a competitive economic space when key macroeconomic profile factors are taken into account. BIMSTEC is a less developed and poor-one region and it needs a lot of capital for the development of infrastructure. It is predicted by IMF that it is also fast-growing and has much potential to grow in the near future (WEO, 2016). It needs foreign capital to fulfill its investment needs (Singh, 2022; Singh *et al*., 2023).

The association between foreign inflows on recipient countries' economic growth is a burning and controversial issue. Saini and Singhania (2018); Rahman *et al*., (2019); Adedayo *et al*., (2020), Ayenew (2022), and Abouelfarag and Abed (2020); Saini and Ravinder (2022); Saini (2022a); Saini (2022b) tested the association of various sources of foreign inflows with nations' growth simultaneously. They found that FDI, remittances, and foreign aid have an important role in determining recipient nations' growth. Whereas the results of Abdullahi *et al.,* (2017) highlighted that foreign inflows have been found negative on the economic growth of 24 SSA nations. Similarly, Ehigiamusoe and Lean (2019), Ayenew (2022), and Duodu and Baidoo (2020) also found the negative effect of overseas loans, foreign aid, remittances, and external debt on development. The result of Ehigiamusoe and Lean (2019) suggests that foreign aid and FDI have an insignificant effect on development.

To test the influence of overseas inflows on the recipient nations' progress, the majority of previous empirical studies like Alege and Ogundipe (2013), Ashurov *et al*., (2020) and Abouelfarag and Abed (2020) emphasis on a sole pointer for overseas inflows. A fair and true influence of overseas inflows on the growth of receiving nations can be drawn out by the inclusion of more macroeconomic variables. This study has taken four important indicators as a proxy of foreign inflows which are: FDI, External Debt, Remittances, and Foreign aid.

Therefore, the study is an attempt to examine the effect of foreign capital inflows on the BIMSTEC nations' during the time frame 2010-2021 by employing a one-step GMM method for the analysis of data.

2. Review of Literature

To fulfilling the vacuum between saving-investment, export-import, and fiscal income and expenditure, overseas inflows are needed (Bacha, 2011). Foreign capital inflows can be in various forms. FDI is one of the significant forms of overseas capital sources. It helps to assist capital formation, technology transfers, trade integration, and create a fair and competitive market, etc. Similarly, foreign aid helps to improve man force capital by improving infrastructural facilities, healthcare facilities, water and electricity supply, sanitation, etc (Addison and Tarp, 2015). Promotion of investment, increase in demand and supply, and increase in consumption can result from the inflows of remittances (Pradhan *et al*., 2008). Also, foreign debt helps in fulfilling the financing needs of developing nations for promoting growth (Saini and Ravinder, 2022; Singh *et al*., 2023). Foreign inflows have not necessarily positive effect always. It has been found that FDI may gathers domestic investment (Markusen and Venables, 1999). Remittances may hurt labour force participation by creating moral hazard problems (Barajas *et al*., 2009). Sometimes, overseas aid creates a dependency mentality in the recipient nation which can result in a failure by not investing it in productive sectors and mismanagement (Niyonkuru, 2016). Moral hazard issues brought on by remittance inflow could lower the rate of labour force participation (Barajas *et al*., 2009). Due to debt service obligations, having external debt could also hinder economic growth.

Table 1: Review Summary

Authors	*Period*	*Country and Variables*	*Methodology*	*Results*
Alege and Ogundipe (2013)	1970-2011	ECOWAS nations; FDI and Economic Growth	System GMM model	Insignificant influence of FDI on ECOWAS nations.
Ashurov *et al.* (2020)	2000-2017	Central Asian nations	GMM Dynamic model	FDI of previous year, economic growth, participation of labor, openness to trade and tax has been found major determinants of FDI in sample nations.
Saini and Singhania (2018)	2004-2013	20 countries; and the variables are GDP growth, openness to trade, domestic capital etc.	GMM Dynamic model	Economic determinants have a positive impact on FDI and policy-related macroeconomic determinants are major factors attracting FDI in sample countries.
Oladipo (2013)	1985-2010	Nigeria; Money Supply, GDP, Openness to trade, Capital expenses made by the government, FDI, Level of poverty, and Exchange Rate (EXR).	GMM model	Various macroeconomic determinants such as INR, EXR, and openness to trade have been found to be attracting FDI in Nigeria.
Rahman *et al.* (2019)	1975-2016	Five South Asian nations; GDP growth rate, domestic capital (GCF), remittance-GDP ratio, rate of inflation, FDI-GDP ratio, government consumption expenditure and energy consumption.	Static and Dynamic GMM model	Energy use, domestic capital, and remittances have been found significant variables in determining growth.
Adedayo *et al.* (2020)	2002-2017	20 Sub-Saharan African countries; Remittances, consumption rate, foreign aid	System GMM model	Foreign aid and remittances have a positive but insignificant impact on private consumption.
Ibrahim (2017)	2010-2015	24 Sub-Saharan African Nations; Domestic capital. GDP, openness to trade etc.	GMM model	foreign capital inflow negatively affects economic growth.

contd. table 1

Authors	*Period*	*Country and Variables*	*Methodology*	*Results*
Daumal (2010)	1989-2002	26 Brazilian states; GDP, inflation, and openness to trade	System GMM model	The liberalization of the nation has a positive impact on growth as it helps to increase per capita income.
Ehigiamusoe and Lean (2019)	1980-2015	Nigeria; FPI, FDI, foreign loans, and foreign aid	ARDL bounds test	External loans have a negative influence on growth whereas the influence of FPI has been found positive. While the impact of aid and FDI has been found insignificant.
Abouelfarag and Abed (2020)	1985-2014	Egypt; FDI, external debt, domestic capital, exports, human capital, technology gap	ARDL bound test	In Egypt, the growth has been positively impacted by foreign investment whereas the effect of foreign debt is negative.
Ustarz and Fanta (2021)	1990-2018	Sub-Saharan African nations	GMM model	Financial growth has a positive influence.
Duodu and Baidoo (2020)	1984-2018	Ghana; Openness to trade, institutional quality, financial development, rate of exchange, and inflation influence technological progress	ARDL model	The impact of remittances has been found positive influence while FDI and debt have a negative influence.
Afridi *et al.* (2019)	2008-2015	SAARC region; FDI, trade, debt, aid, and remittances.	GMM test	A considerable relationship has been found between foreign inflows on growth.
Ayenew (2022)	2009-2019	31 SSA countries FDI, remittances, aid, external debt, population, trade openness, domestic capital, inflation, economic growth.	Two-step system GMM model	The impact of aid, debt, and remittances has been found a negative and the positive impact of FDI has been found.
Soomro *et al.* (2022)	2000-2018	BRICS nations Gross Domestic Product, subscriptions of Telephone, Mobile, Broadband and Internet, Secure internet servers, Trade, and FDI.	GMM model	The stimulus of ICT, FDI, and trade is positive on GDP.

contd. table 1

Authors	*Period*	*Country and Variables*	*Methodology*	*Results*
Singh *et al.* (2023)	1976-2020	India Financial development, FDI, Trade Openness and Technological Developments	ARDL	Adverse repercussion of FDI on economic progress

Source: Authors' Compilation

3. Objective and Hypothesis of the Study

After considering the success and failures of overseas capital, it is important to test the influence of foreign capital inflows on the economic growth of BISMTEC nations'. The study tests the influence of foreign inflows on BIMSTEC nations' economic growth during the time 2010-2021 by employing the one-step system GMM method. the data has been taken from WDI, 2022.

H_0: *There is not a significant positive association between foreign capital inflows and economic growth in BIMSTEC nations.*

4. Research Methodology

The balanced panel data to inspect the influence of overseas capital flows on the economic growth of BIMSTEC nations has been used. GDP measured in current US $ is taken as the dependent variable and personal remittances, external debt, foreign direct investment, foreign aid, inflation, openness to trade, and the population are taken as the explained variable. The annual data is taken from WDI 2022, a database of the world bank. The study takes seven BIMSTEC nations by covering a period from 2010-2021.

The explanation of variables and their measurements are displayed in table 2. The model specified is:

$$GDP_{it} = \beta_0 + \sum_{i=1}^{p} \partial_{it} REM_{it} + \sum_{i=0}^{p} \partial_{it} FDI_{it} + \sum_{i=1}^{p} \partial_{it} DEBT_{it} + \sum_{i=1}^{p} \partial_{it} FAID_{it} + \sum_{i=1}^{p} \partial_{it} INF_{it} + \sum_{i=0}^{p} \partial_{it} TOP_{it} + \sum_{i=0}^{p} \partial_{it} POP_{it} + \varepsilon_{it} \tag{1}$$

Where the subscript i and t refers to country and time, respectively. εit is the error term.

Pooled OLS, fixed effects (FE), and random effects (RE) models are generally used as standard panel models but these have serious shortcomings. The estimator in a fixed-effects model is assumed to have common slopes and variance in country-specific intercepts. Pooled OLS model imposes slope coefficients and common intercept for all cross-sections, so it is a highly restrictive model (Baltagi, 2008). If some of the regressors are found endogenous and a correlation is found between the explained variable and the error term, the fixed effect model provides biased estimates (Campos and Kinoshita,

Table 2: Variable Description

Symbols	*Variable description*
FDI	Foreign direct investment, net inflows in terms of current US$
REM	Personal remittances, received in terms of current US$
DEBT	External debt taken for long-term in terms of current US$
GDP	GDP measured in current US$
FAID	Net official aid received (current US$)
INF	Inflation, consumer prices (annual %)
TOP	Exports + Imports/GDP
POP	Population, total

Source: WDI, 2023

2008; Singh *et al*., 2023). The random effects model is found less problematic as it assumes common intercepts.

The only limitation of the random effects model is that it is time-variant. According to this, the error at any time is strictly exogenous and unrelated to the future, past, or present, (Arellano, 1991). Hausman statistics help to make a suitable choice between FE and RE models by investigating whether there is any relation to individual effects or not. To sum up, a major problem in the empirical growth literature is that the static panel techniques fail to account for the dynamic nature of the data. Additionally, these estimators only accommodate structural heterogeneity as random or fixed effects and enforce homogenous assumptions.

When the no. of cross-sections is more than the time period, the GMM estimator works well. GMM techniques have been used to macro panel data in a wide range of recent research, including in the fields of growth, FDI, and financial development.

Therefore, we have used the one-step system GMM for analyzing the panel data as Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). It overcomes the limitations of the difference GMM. The system GMM method is a better method as it considers bias and precision when the series is persistent. The lagged levels of the explanatory variables combine both the first difference and level equations in the system GMM. As a result, the system GMM was used in the study because of its high efficiency and low bias. One-step and two-step system GMM are the two forms of system GMM.

One-step GMM has been used as the variance and covariance matrix provides correct coverage but a two-step estimator was not available and full rank.

5. Data Analysis

The study proceeds with the estimation of preliminary analysis of the variables.

Table 2: Summary Statistics

Variable	*Mean*	*Std. deviation*	*Minimum*	*Maximum*
GDP	451152.4	795733.3	1547.991	3176295
FDI	7692.991	14351.99	-4947.47	64362.36
REM	15494.4	23881.5	8.273481	89375.15
DEBT	78880.44	126405.7	919.4053	475076.4
FAID	2.174224	2.518683	-0.26848	9.861695
INF	5.685898	2.832684	-0.90043	11.98939
TOP	0.621793	0.318415	0.219741	1.397294
POP	2.37E+08	4.51E+08	705516	1.41E+09

Source: Authors' calculation

For the studied nations, the average GDP in the current US$ is 451 billion. Remittance and FDI have a mean value of US$ 7.69 billion and US$ 15.50 billion, correspondingly. The average value of foreign aid, in the BIMSTEC nations is 7.39. whereas the average of debt is 32.51.

Table 3 displays the correlation between the various variables. The degree of correlation between the variables can be ascertained with the aid of correlation analysis. The results show that there is some association between the variables, but not much. With the exception of the correlations between remittances and FDI, debt and remittances, and population and GDP, FDI, remittances, and debt, the matrix result only weakly links the model's input variables.

Table 3: Correlation Matrix

	GDP	*FDI*	*REM*	*DEBT*	*FAID*	*INF*	*TOP*	*POP*
GDP	1.00							
FDI	0.96	1.00						
REM	0.97	0.92	1.00					
DEBT	0.99	0.95	0.96	1.00				
FAID	-0.43	-0.41	-0.41	-0.47	1.00			
INF	0.05	0.06	0.09	0.009	0.27	1.00		
TOP	-0.28	-0.26	-0.05	-0.24	0.16	-0.43	1.00	
POP	0.96	0.92	0.95	0.95	-0.37	0.12	-0.24	1.00

Source: Authors' Calculation

6. Result and Discussion

The outcomes of the one-step GMM show that FDI, external debt, inflation, and openness to trade are statistically substantial, having an impact on the economic growth of BIMSTEC nations. But FDI and inflation have a considerable deleterious influence on economic growth. Whereas external debt and trade openness have a substantial positive effect. The negative and significant value of FDI shows that an increase of 1 percent in FDI would lead to a 5.38 percent reduction in GDP. It suggests that FDI has an adverse effect on economic growth.

Table 4: Results of One-step System GMM Model

One-step GMM estimation		
Variables	*Coeff. Value*	*p-value*
GDP	0.7290029	0.0000
FDI	-5.387913	0.006
REM	-5.326917	0.177
DEBT	3.161317	0.0000
FAID	2.480	0.757
INF	-9.530000000	0.036
TOP	3.00000000000	0.017
POP	182.4294	0.115

Source: Authors' Calculation

The effect of foreign aid, population, and remittances has been found statistically insignificant. The outcomes reveal that remittances have also a negative but insignificant influence on economic growth. A 1 percent increase in remittances would lead to a 5.32 reduction in economic growth. If all other factors remain unchanged, a one percent increase in external debt boosts GDP by 3.16 percent. It is also found that the one percent increase in foreign aid could lead to a 2.48 percent increase in economic growth. Foreign aid has a positive but insignificant influence on economic growth in BIMSTEC nations. Population growth has a positive but insignificant effect on the economic growth of BIMSTEC nations.

The negative and significant influence of FDI on economic growth is similar to the results of Soomro *et al.*, (2022) and Ehigiamusoe and Lean (2019). According to Saini and Ravinder (2022) and Singh *et al.* (2023), even high amounts of FDI are insufficient for accelerating economic growth in a host nation unless that nation has reached the basic stage of development in terms of income, education, and complementing trade policies. As a result, a host country's ability to absorb FDI effectively and channel it towards long-term development is influenced by various factors, and low-income nations are less likely to meet these initial absorptive requirements. Similarly, Soomro et al., (2022) suggested that the government should focus on technology development for proper utilization of foreign direct investment. Singh (2022) and Singh *et al.* (2023) also contended that for the utilization of FDI and its significant contribution to economic growth, the government should focus on technology transfer, human capital, and training of labor for increasing their efficiency, creating safe and stable market opportunities, etc.

The negative and insignificant impact of remittances is similar to the results of Jongwanich (2007) and Salahuddin and Gow (2015). Also, Siddique *et al.* (2012) found that on the economic growth of Bangladesh, no impact of remittances has been found. It can be due to information asymmetry. It means the remitter is not aware of the use of remittances by the recipient. Sometimes, it happens that the recipients do not invest the amount received as remittances in productive projects. Another reason for the negative influence of remittances can be their use for consumption only. One more reason can be the appreciation in the exchange rate. It may reduce the competitiveness of the nation which can lead to increased imports and decrease exports. Therefore, the remittances can affect growth adversely through the rate of forex appreciation (Saini *et al.*, 2022a; Saini *et al.*, 2022b).

The insignificant influence of remittance on growth is opposite to the finding of Abduvaliev and Bustillo (2020), Adjei *et al.* (2020) and Depken *et al.* (2021) who found a positive and significant effect of remittances on economic growth. Shah and Pervin (2012) also found similar results to our results whereas contrary to Safdari and Mehrizi (2012). They also found the positive impact of debt on economic growth. Shah and Pervin (2012) clearly represented that the debt wing needs to be more careful about the investment of debt. The researchers also found that by crowding out private investment or changing the public investment composition, debt impacts growth.

Safdari and Mehrizi (2012) found that the negative impact of external debt on economic growth can be a result of not investing the loan amount in productive sectors, also the extra resources can enter the speculation channels and optimum volume in using loans that were not based on the absorptive capacity of the country. Saini *et al.* (2022a) found that in fact, foreign aid helps to promote growth and reduce poverty. It contributes to growth by increasing public spending and lower domestic borrowings. Burnside and Dollar (2000) observed that if in an economy, there is a good policy environment, the aid can affect growth positively but it doesn't work well in a nation with a low level of technology, development of human capital, and political and macroeconomic stability (Ehigiamusoe and Lean, 2019). The negative influence of inflation on economic growth is similar to Saqib *et al.* (2013). Additionally, the degree to which the recipient nation is capable of absorbing cutting-edge technologies, the level of financial system development, macroeconomic stability, and the level of human capital development could influence how some aspects of foreign capital inflows impact growth (Verma *et al.*, 2021; Singh *et al.*, 2023).

7. Conclusion

This study is an attempt to test the influence of foreign financial inflows on the BIMSTEC nation's economic growth of BIMSTEC countries from 2010 to 2021. The study employed the one-step system GMM estimation method and found that positively significant impact on foreign aid, population, and remittances. While the impact of remittances is inconsiderably negative on economic growth. The impact of foreign aid, population, and remittances has been found statistically insignificant. The outcomes reveal that remittances have also a negative but insignificant influence on economic growth.

The results confirmed the presence of heterogeneity in foreign capital inflows. When forming policies, emerging nations must make advancements in a variety of areas, including the freedom index, economic openness, and skill-based training for workers to boost technical proficiency and growth rate stability. These advantages should be considered in conjunction with the liberal economic system.

Finally, all the BIMSTEC countries should revise their policies and strategies regarding openness to trade, usage of external debt, and foreign aid. Various growth theories found foreign inflows an important factor for economic growth. Further accelerating these nations' economic growth will include the adoption and implementation of sound policies, the identification and removal of internal and external hurdles, and other related activities.

Additionally, they need to make sure that the external debt, taxes, labour market, and trade openness are all effectively enforced and improved through methods like transparency, flexibility, and others. Additionally, policymakers should be mindful of boosting and consistently maintaining GDP growth.

The outcomes suggest that to induce greater investment, government policies should support easy access to technology. The study's limitation to BIMSTEC nations is one of its drawbacks. Researchers will therefore need to broaden their investigation to incorporate information from developing nations, such as those in South Asia and Southeast Asia.

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