**The impact of macroeconomic determinants on cross-country FDI flows: A comparative analysis of 14 international alliances**

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**Abstract**

*This study investigates the relationship between Foreign Direct Investment (FDI) and macroeconomic variables like Gross Domestic Product (GDP), Gross Capital Formation (GCF), Agriculture, Forestry, and Fishing (AFF), Industry, Import, Export, Inflation and Unemployment rate. Panel Data of 14 regional alliances countries from 1990-2018 were collected from the World Development Indicators. This research has come to conclusion based on the robust regression models like Driscoll Kraay, Two Stage Least Square and Generalized methods of moments. It is found that GDP has significant positive relationship with FDI in all regions except Arab League, EU and G7 countries. Alongside, GCF has positive impact on FDI in Arab League, BRI, GATT, NAFTA countries while negative impact in APEC, G7 countries. On the other hand, AFF has positive influence on FDI in BRICS, GATT countries & negative relationship in African Union, ASEAN, BIMSTEC, BRI, BRICS, SAFTA countries. Unlike GDP, GCF and AFF other variables have heterogenous relationship with FDI for different alliances. Overall, the study has significant insights of impact of macroeconomic variables on FDI on 14 international alliances.*

***Key words:*** *Foreign Direct Investment, Gross Domestic Product, Gross Capital Formation, Agriculture, Forestry and Fishing, Industry, Export, Import, Inflation rate, Unemployment rate.*

1. **Introduction:**

The paper is aimed to analyze relationship between foreign direct investment (FDI) and some macroeconomic variables such as gross domestic product, gross capital formation, value addition of agriculture, forestry and fishing, value addition of industry including constructions, import of goods and services, export of goods and services, consumer price indices, unemployment rate of 14 regional alliances’ countries of the world. It is assumed that there might be a link between foreign direct investments and these variables. As all of these indicators directly and indirectly influence the gross domestic product of a country, we want to find their relationship with foreign direct investment.

De Mello has noticed beneficial impact of FDI on economic development, both in developed and developing countries, but concludes that long-term growth in host countries is driven by technology and infrastructure. Information spillovers from countries that spend in developing countries [1]. Blomstrom states that, in order for FDI to have a significant effect on economic growth, the nation must have reached a degree of production that allows it to benefit from the effects of high productivity [2].

Makki et al said foreign direct investment (FDI) and trade are also seen as significant catalysts for developed countries ' economic development. They introduced FDI as an important tool for the transition of technology from developed to emerging countries. In addition, FDI promotes domestic investment and encourages developments in host country human resources and institutions [3].

Kueh et al claimed that Malaysia 's external FDI data was particularly apparent in the 1990s. Their research aimed to investigate the macroeconomic determinants of Malaysia 's outer FDI, namely real wages, exchange rate, free trade and interest rate. They used the cointegration test by Johansen and Juselius and the technique for correction of vector errors. They studied the quarterly data from 1991: Q1to 2005: Q4 and found that Malaysia 's outward FDI is favorably influenced in the long run by all of the variables under review. They also found that in the short term, Granger's interest rate will not trigger external FDI [4] .

Babajide et al analyzed the interaction between the FDI and some of the chosen macroeconomic factors, both in Nigeria's long-term and short-term equilibrium, based on the FDI Macroeconomic Theory. Their research used ARDL estimation techniques to investigate whether the chosen macroeconomic variables have substantial impact on FDI, what macroeconomic variable(s) should be exploited to boost FDI inflows to the economy of the country, and what policy consequences should be implemented. Their findings found that strategies that aim to boost trade, raise government spending, control the exchange rate mechanism, reduce inflation and interest rates are useful to draw FDI inflows [5].

Iwasaki et al published a meta-analysis of the literature analyzing empirically the effect of FDI on economic development in Central and Eastern Europe and the former Soviet Union. The findings of their analysis of meta-regression revealed that the impact size and statistical importance of the recorded effects are highly dependent on conditions of study. They found that current studies indicate a growth-enhancing impact of FDI in the entire region. They also noted that the experiments in question did not provide conclusive evidence of a non-zero FDI influence. Ultimately, they claimed that further work was required to determine the true effect [6].

The paper is divided into five chapters. First chapter is the introduction. The second chapter is aimed at the relevant literature overview. A model used and data are specified in the third chapter. The third chapter also deals with research methodology. The forth chapter is about the finding and analysis of different model. The last chapter includes conclusion along with some recommendation.

**2. Literature Review:**

Many scholars have confirmed the positive effect of FDI on developing economies [7], [8]. FDI is especially important for transition economies, as these economies have inadequate savings, and technologies and resources are required to support economic development. [5, 9], [10]

Abramovitz (1986) concluded that human capital power, economic and political stability as well as market transparency are the requirements for host countries to benefit from FDI inflows. Barensztein et al assumed that FDI could impose higher output productivity only if the host developing countries achieved the lowest level of human capital accumulation [11]. Markusen et al. from the point of view of the developed countries, stressed long-term deciding factors for FDI operations, such as absolute / comparative national endowment, business scale / distance and trade [12]. According to Bengoa et al recipient economies need human resources, economic growth, and liberalized markets to benefit from long-term FDI inflows [13].

The relationship between FDI and several other significant parameters, such as the political system and foreign trade, has drawn many researchers around the world and has given rise to broad and growing literature. Hanson et al argues that the evidence that FDI produces beneficial spillovers for host countries is small [14]. Mansfield et al noticed that pairs of democratic countries set lower barriers to trade and thereby participate in more free international ties [15]. Borensztein et al empirically investigated the association between FDI and economic development in developing countries. They have shown that FDI enables technological transfer and faster development when the host country has a minimum human capital stock threshold [11]. Busse studied both cross-section and panel data analysis were used and showed that democracy is rising FDI inflows in developing countries [16].

Meon and Sekkat concluded based on MENA countries, also explores the relationship between the institutions and the FDI [17]. Milner and Kubota argue that regime change into democracy decreases the potential for political institutions to create support for trade barriers, which is why it is democratization that increases trade transparency [18]. Benassy et al explored the structural determinants of FDI, concentrating primarily on the principles of 'institutional consistency' and 'institutional scope’ [19].

Kamaly observed that FDI 's approach to macroeconomic fundamentals is very slow to highlight the long-term effect of macroeconomic policy [20]. Busse and Hefeker indicate that government stability, lack of internal strife and fundamental democratic protections are primary determinants of foreign direct investment inflows. They notice that 'good institutions' are almost always growing the sum of FDI. That's it. Effect, they claim, is independent of the influence of GDP per capita [21]. Meon and Sekkat found that institutional efficiency improves FDI inflows, while reverse causality could be responsible for weakening the statistical relationship [17]. Gbakou et al also found that macro-economic stability is important to reflect the effect of FDI on economic development [22].

There is a vast number of studies that concentrate on factors that affect the movement of global capital in developing economies. These studies concentrate on the fiscal, socio-political and structural facets of FDI. Global factors describe variables related to market demand, labour prices, trade openness, economic development. Important determinants of FDI flow have been generally recognized in virtually all empiric experiments that describe the determinants of FDI [10]; [23]; [24]; [25]; [26]; [27]; [28]; [29]. Several reports have used actual gross domestic product per capita or actual gross national product per capita for the business size of a region or wages within a region. True GDP used as a business proxy. A scale that indicates greater spending power, so companies will theoretically earn better returns on investments in their resources and earn greater income on their investments. They thus assumed a good relationship between the business size and the FDI.

A variety of studies have shown that the overall impact of FDI on the export output of the host country is significant. Studies in China show that increased levels of FDI have a positive impact on Chinese manufacturing export output [30]; [31]; [32]. However, this success is due to the fact that FDI has primarily been export-oriented in China. Related observations have been found in Ireland by [33]. [34] analyzed the role of export-oriented FDI in Malaysia's manufacturing exports. The export-oriented FDI has brought a substantial return to Malaysia due to the favorable economic climate for internationalization manufacturing. The relationship between inward FDI and manufactured exports for a cross-section of 52 countries was studied by UNCTAD (1999) and an important positive relationship was established. This is the relationships are greater for emerging countries than for developed countries and higher than for low-tech sectors.

Doytch et al analyzed the impact of manufacturing and service FDI (foreign direct investment) on the development of their own industry, the spillover to other sectors and the overall economy in host countries. They described major sectoral and inter-industry spillover consequences of specific data classifications and forms of FDI flows. Their research indicated that the growth impact of manufacturing FDI occurs by increasing production in its own (manufacturing) sector and is widespread in Latin America, the Caribbean, Europe-Central Asia, middle and low-income countries and economies with a significant market share. An increase in FDI services is expected to stimulate development in the service sectors, but adversely impact activity in the manufacturing industries. Financial services FDI stimulates demand in South East Asia and the Caribbean, high-income countries and service-based markets by enhancing both industrial and service-based operations. Nevertheless, the non-financial sector FDI wastes money and hurts the automotive business in the same community of countries. They argued that moving from production to service FDI is likely to lead to deindustrialization in some areas and types of economies if this transition is powered by non-financial FDI [35].

Fadhil et al found that Malaysia was known as one of the most common foreign direct investment (FDI) destinations in Southeast Asia. Yet how are these FDI inflows impacting the Malaysian economy. The goal of their work is to define the role of FDI inflows in Malaysia's economic growth by means of the proposed endogenous growth model. They used annual statistics span the period from 1975 to 2010. They used Unit root test and Johansen Co-integration test to ensure that the time series data is stable and that the linear mixture of the variables is stationary. The Hierarchical Multiple Regressions (HMR) study is then performed to assess the pace of Malaysia's economic development, including FDI inflows. The findings indicated that the inflows of FDI along with the production of human resources add substantially to the economic growth of the host nation. Yet the technological spillover of FDI inflows is still not properly paired with human resources to lead to economic development. Therefore, it appears that the government is making more effort to build national human resources to draw and support FDI inflows. Moreover, the opening-up of the economy and the foreign exchange situation must begin to shift in a favorable direction [36].

Hong proposed GMM to re-evaluate the influence of FDI on economic growth in China and the related FDI factor for the period 1994-2010, based on complex panel data from 254 prefecture-level cities in China. They found that FDI had a positive impact on economic growth. Moreover, economies of scale, human resources, services, wage rates, regional disparities are aggressively interfering with FDI and fostering economic development in China, though free trade does not contribute to substantial FDI. In fact, FDI is expected to overwhelm international capital and leave domestic capital and large foreign-exchange assets with the question of fair use [37].

Szkorupova and finance analyzed the relationship between foreign direct investment, economic development and exports in Slovakia. Estimates of the impact on economic growth have been made for Slovakia in the period 2001-2010. The co-integration approach and the vector error correction model have been applied to quarterly results. The findings demonstrate the presence of long-term causal linkages between the variables tested in Slovakia. They also described the positive effect of foreign direct investment and the positive influence of exports on gross domestic product. On the basis of the analysis approach and the available time series, the widely held view on foreign direct investment has had a favorable impact on the country's economic development [38].

Ahmed examined the impact of human resources, labor force and absorption ability, physical capital as a control variable, foreign direct investment (FDI) inflows and gross domestic product (GDP) on Malaysia's productivity growth. Quarterly time series data from 1999 to 2008 has been included. The effects of FDI inflows on human resources, labor force, absorption ability and physical capital were studied. The Ordinary Lowest Squares (OLS) regression was used to estimate the data in the first step and the productivity metrics in the second step were estimated. The findings demonstrate that the FDI inflows and inputs used contribute negatively to total factor productivity (TFP). In the meantime, FDI plays a significant role in achieving economic development by input guided by the contribution of the TFP. In this regard, a substantial positive relationship has been identified between human resources, labor force and absorption potential, which defines the spillover impact on Malaysia's economic growth (GDP), and physical capital has shown a negative relationship [39].

Nandi and Sciences argued that, with the economies of the developing world in dire straits and signs of recovery becoming increasingly distant, the burden of opening up a new wave of economic development has dropped dramatically on the shoulders of the BRIC countries (Brazil, Russia, India, China). How these countries respond to this herculean challenge would rely on a variety of factors: one of them is the patterns in their foreign direct investment (FDI) inward and outward. This paper aims at examining the history, current and future of FDI policies in BRIC countries and their effect on the sustainability of the economy worldwide. The critical points of study of this paper are as follows: I To compare the statistics and history of FDI patterns in BRIC countries over the last 10 years; (ii) to examine the effects of government policies on international trade in BRIC countries; (iii) Creating an understanding of the influence of the ongoing economic crisis on the current trends of FDI in developed countries; and (iv) exploring the scope for possible changes in FDI policies in BRIC countries ( especially India) and predicting their potential consequences. They hope that the study carried out in this paper will help at least to shed light on the challenging challenge of decisively understanding the paradigms of economic development in the BRIC nations and their ultimately cascading impact on the future economic survival of the world [40].

Jadhav and Sciences examined the role of technological, social and political factors in attracting foreign direct investment (FDI) to the BRICS (Brazil, Russia, India, China and South Africa) economy and the comparative weighting of these factors in attracting FDI. The research uses panel data for a period of 10 years (2000-2009) to analyze the major determinants of FDI in BRICS from a systemic perspective. The study was carried out using a panel unit-root test and multiple regressions. This analysis takes into account market size, trade flexibility, natural capital as economic determinants and Macroeconomic Stability (Inflation Rate), Political Stability / No Crime, Government Efficacy, Regulatory Efficiency, Corruption Prevention, Speech and Responsibility, Rule of Law as possible institutional and political determinants of FDI. These influences are based on their relative significance in previous empiric literature. The results suggest that economic factors are more important than structural and political factors in the BRICS economies. The findings show that the business size determined by real GDP is an important determinant of FDI, which suggests that much of the investment in BRICS is driven by a demand-seeking target. Study of scientific evidence often suggests that trade transparency, supply of natural resources, rule of law and speech and responsibility are statistically important. Market-size coefficients, exchange transparency are positive, which means that these factors have a positive impact on overall inward FDI. Availability of natural resources has a negative influence on overall inward FDI, which indicates that FDI is not driven by a resource-seeking motive in BRICS economies [41].

Goswami et al. stated that after more than four decades of inward-looking import substitution strategy with public oversight, India introduced the Modern Economic Policy (NEP) in 1991 following the economic crisis. The NEP abolished all types of export prejudices and introduced changes in the fields of foreign exchange, investment, financial market, and corporate and public market deregulation. Flows of global capital are accepted. East Asian experience has shown that export-led development initiatives have been promoted by FDI exporting the technologies, management and other skills required to leverage the country's competitive advantage to the host country. To this back-drop, this analysis has three objectives. First, it examines developments in FDI in India over the period 1991-92—-2010-11. Second, on the basis of the annual time series results, the relationship between FDI and the produced exports was analyzed for the same duration using the Vector Error Correction Model (VECM). They noticed bi-directional causality between FDI and Exports. Finally, the paper points out the current state of FDI & exports in the North East Region (NER) with an emphasis on their prospects. The government's Look East Strategy (LEP). The area could benefit from its strategic location. However, despite having the inherent benefit of trading with neighboring countries and the capacity for developing different industries as being blessed with large natural resources, the NER is unable to draw any substantial amount of FDI due to infrastructural and other bottlenecks. It is important to eliminate those fundamental restrictions by strategic action [42].

Nistor and Finace reported that the BRICS group of economies, Brazil, Russia, India, China and South Africa, are regarded as the most developed economies in the developing economies. The goal of his paper is to examine the FDI flows in the BRICS economy. The effect of FDI on the host country depends on the scale and nature of those flows. In the current economic situation, there is a global competition between host countries to attract greater volumes of FDI. The BRICS Community provides a variety of opportunities to international investors, such as young labour power, inexpensive labor capital, natural resources and large markets. FDI continues to have a positive influence in these emerging economies by contributing to their growth [43].

Dritsaki et al have analyzed the relationship between foreign direct investment, exports and economic development in Croatia using annual time series data for the period 1994-2012. Several econometric models are used, including the ARDL approach and the ECM-ARDL model. The results confirm the bi-directional long-term and short-term causal relationship between exports and growth. These findings give different viewpoints and insights into a new strategy for balanced economic development in Croatia [44].

Silajdzic et al used an econometric analysis to analyze the effect of FDI and associated externalities on economic development in transition economies. They also contributed to recent literature by using more accurate metrics of FDI, while also portraying the essence of FDI and associated information spillovers, as well as exploring the significance of technical and creative capacities in describing the growth success of transition economies that have not been previously studied. Overall, the findings of our empiric review seem to underpin the idea that FDI contributes to economic growth primarily by information spillovers, and that higher levels of technical change powered by government and company R&D investment are related to better growth output among transition economies. Essentially, by the manner in which FDI was calculated in this research (i.e. the share of FDI in the output of gross value added) and in view of the interconnected context in which they analyze the relationship between FDI and economic growth, it is possible to stipulate that the positive effect of FDI on economic growth is correlated with increased knowledge-ability and efficiency-seeking FDI. [45] used a threshold regression model and considers new evidence that the positive effect of FDI on growth "kicks in" only after the creation of the financial markets has crossed the threshold. Until then, there is no advantage to FDI [46].

3. **Methodology:** Explorative analysis was carried out according to the following data and methods:

***Data:*** Secondary dynamic panel data had been collected for 14 regional alliances countries of the world for the years 1990-2018 mainly from World Development Indicators of World Bank. Data is about 14 regional alliances countries, 29 years, 9 variables. As this data are presented in different units of currency and figures, data correction has been done to harmonize the data for cross analysis. It has first been log normalized for analyzing the stochastic frontier. Then the data have been first degree differentiated for neutralizing the autocorrelation problem. Data were firstly in million-dollar figures, some were in billion dollars’ figure, some were in local currency figure, some were in percentile figure, some were in ratio figure. All these data had been converted into billion dollars for all the variables.

***Methods:*** Composite step by step model-based study had been conducted:

1. *Ordinary Least Squares (OLS):* To define the relationship between FDI and macroeconomic variables the OLS model had been used.
2. *Pooled Ordinary Least Squares (POLS):* POLS method had been used to identify the relationship between FDI and macroeconomic variables.
3. Drisc/Kraay *(DK):* OLS method had been used to identify the relationship between FDI and macroeconomic variables.
4. *Two stage least square model (2SLS)*: To define the relationship between FDI and macroeconomic variables using STATA 15, the 2SLS model had been used.
5. *Generalized Method of Moments (GMM):* Multivariate regression methods had been used to identify significant explanatory variables which can explain the reasons for relationship between FDI and macroeconomic variables.

***Variables and description:***

|  |  |  |  |
| --- | --- | --- | --- |
| Sl.no. | Variable | Description | Unit |
| 1 | lnFDI | Log normal of Foreign direct investment, net inflows (BoP, current) | USD |
| 2 | lnGDP | Log normal of Gross Domestic Product (current) | USD |
| 3 | lnGCF | Log normal of Gross Capital Formation | % of GDP |
| 4 | lnAFFva | Log normal of Agriculture, forestry, and fishing, value added | % of GDP |
| 5 | lnInva | Log normal of Industry (including construction), value added | % of GDP |
| 6 | lnIM | Log normal of Imports of goods and services | % of GDP |
| 7 | lnEx | Log normal of Exports of goods and services | % of GDP |
| 8 | InINF | Log normal of Inflation, consumer prices (annual) | % |
| 9 | InUNEM | Log normal of Unemployment, total (modeled ILO estimate) | (% of total labor force) |

***Hypotheses:***

|  |  |
| --- | --- |
| No. | Hypotheses |
| H1 | There is a positive relationship between foreign direct investment and gross domestic product. |
| H2 | There is a positive relationship between foreign direct investment and gross capital formation. |
| H3 | There is a positive relationship between foreign direct investment and Agriculture, forestry and fishing |
| H4 | There is a positive relationship between foreign direct investment and industry value added |
| H5 | There is a negative relationship between foreign direct investment and imports of goods and services |
| H6 | There is a positive relationship between foreign direct investment and exports of goods and services |
| H7 | There is a negative relationship between foreign direct investment and Inflation, consumer prices. |
| H8 | There is a negative relationship between foreign direct investment and unemployment rate. |

**Findings and analysis:** Here general statistics on the variables of different international alliances has been added to illustrate overall value of the variables.

**Table: 1 Descriptive Statistics**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **African Union** | | | **APEC** | | | **Arab League** | | |
| Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| FDI | 1480 | 5.32E+08 | 1.31E+09 | 578 | 3.52E+10 | 7.72E+10 | 600 | 1.36E+09 | 3.61E+09 |
| GDP | 1434 | 2.37E+10 | 5.86E+10 | 580 | 1.41E+12 | 3.15E+12 | 563 | 7.08E+10 | 1.14E+11 |
| GCF | 1304 | 21.218 | 9.671 | 566 | 26.133 | 6.73 | 482 | 24.647 | 9.181 |
| AFFva | 1328 | 22.922 | 14.57 | 544 | 7.811 | 8.072 | 487 | 11.611 | 11.449 |
| Inva | 1323 | 25.169 | 13.432 | 544 | 33.708 | 10.844 | 463 | 36.766 | 17.708 |
| IM | 1319 | 40.386 | 22.87 | 566 | 48.814 | 43.576 | 509 | 43.152 | 24.306 |
| EX | 1319 | 31.214 | 19.764 | 566 | 52.987 | 47.708 | 509 | 41.915 | 24.702 |
| INF | 1389 | 47.202 | 748.477 | 580 | 22.063 | 270.199 | 521 | 10.813 | 29.388 |
| UNEM | 1423 | 8.881 | 7.278 | 558 | 4.701 | 2.375 | 585 | 9.277 | 5.708 |
| **Variables** | **ASEAN** | | | **BIMSTEC** | | | **BRI** | | |
| Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| FDI | 288 | 6.29E+09 | 1.32E+10 | 197 | 3.75E+09 | 8.82E+09 | 3748 | 3.07E+09 | 1.47E+10 |
| GDP | 277 | 1.36E+11 | 1.86E+11 | 193 | 2.21E+11 | 4.76E+11 | 3792 | 1.14E+11 | 5.62E+11 |
| GCF | 256 | 26.509 | 7.239 | 184 | 31.595 | 10.876 | 3266 | 23.646 | 8.699 |
| AFFva | 277 | 16.888 | 13.577 | 193 | 22.391 | 11.067 | 3574 | 15.104 | 12.912 |
| Inva | 277 | 35.698 | 12.636 | 193 | 28.143 | 8.03 | 3529 | 27.704 | 13.163 |
| IM | 274 | 60.892 | 42.418 | 192 | 33.825 | 18.031 | 3514 | 47.062 | 27.172 |
| EX | 274 | 64.198 | 49.551 | 192 | 26.207 | 18.078 | 3514 | 39.955 | 28.328 |
| INF | 286 | 8.258 | 13.46 | 203 | 8.036 | 6.606 | 3729 | 32.17 | 331.939 |
| UNEM | 278 | 3.001 | 2.196 | 194 | 3.545 | 3.215 | 3628 | 7.883 | 6.472 |
| **Variables** | **BRICS** | | | **EU** | | | **G7** | | |
| Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| FDI | 143 | 3.95E+10 | 6.16E+10 | 755 | 1.68E+10 | 4.78E+10 | 203 | 6.57E+10 | 9.16E+10 |
| GDP | 145 | 1.55E+12 | 2.42E+12 | 764 | 4.23E+11 | 7.24E+11 | 203 | 3.85E+12 | 4.05E+12 |
| GCF | 145 | 26.814 | 9.609 | 759 | 23.182 | 4.324 | 203 | 21.634 | 3.173 |
| AFFva | 145 | 9.509 | 7.327 | 709 | 3.17 | 2.846 | 179 | 1.469 | 0.639 |
| Inva | 145 | 31.848 | 7.971 | 709 | 24.971 | 5.986 | 179 | 24.413 | 4.404 |
| IM | 145 | 19.852 | 7.235 | 759 | 53.609 | 28.229 | 203 | 23.97 | 8.523 |
| EX | 145 | 21.844 | 9.232 | 759 | 54.741 | 32.996 | 203 | 24.387 | 9.867 |
| INF | 145 | 87.04 | 370.628 | 753 | 7.593 | 34.912 | 203 | 1.683 | 1.688 |
| UNEM | 139 | 10.57 | 8.967 | 754 | 8.963 | 4.447 | 195 | 7.513 | 2.736 |
| **Variables** | **G20** | | | **GATT** | | | **NAFTA** | | |
| Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| FDI | 549 | 3.91E+10 | 6.84E+10 | 507 | 4.45E+10 | 8.47E+10 | 87 | 9.00E+10 | 1.18E+11 |
| GDP | 551 | 2.04E+12 | 3.11E+12 | 551 | 1.43E+12 | 3.13E+12 | 87 | 4.78E+12 | 5.98E+12 |
| GCF | 551 | 24.425 | 6.66 | 551 | 23.067 | 6.769 | 87 | 21.954 | 1.673 |
| AFFva | 527 | 5.685 | 5.835 | 514 | 5.774 | 6.728 | 69 | 2.427 | 1.426 |
| Inva | 527 | 30.459 | 9.116 | 517 | 25.622 | 7.508 | 69 | 27.366 | 5.244 |
| IM | 551 | 23.367 | 8.427 | 551 | 36.217 | 28.725 | 87 | 24.95 | 9.167 |
| EX | 551 | 24.874 | 10.705 | 551 | 36.916 | 34.36 | 87 | 23.804 | 10.784 |
| INF | 551 | 32.061 | 212.187 | 550 | 19.796 | 178.717 | 87 | 5.041 | 7.382 |
| UNEM | 528 | 7.941 | 5.512 | 529 | 7.19 | 5.512 | 83 | 6.131 | 2.307 |
| **Variables** | **OECD** | | | **SAFTA** | | |  |  |  |
| Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |  |  |  |
| FDI | 1047 | 2.43E+10 | 5.99E+10 | 226 | 2.58E+09 | 8.17E+09 |  |  |  |
| GDP | 1059 | 9.75E+11 | 2.27E+12 | 220 | 1.78E+11 | 4.51E+11 |  |  |  |
| GCF | 1054 | 23.452 | 4.23 | 190 | 28.921 | 11.89 |  |  |  |
| AFFva | 965 | 3.118 | 2.615 | 214 | 21.341 | 9.148 |  |  |  |
| Inva | 965 | 25.987 | 5.277 | 214 | 24.064 | 7.859 |  |  |  |
| IM | 1054 | 41.787 | 23.994 | 208 | 36.859 | 20.302 |  |  |  |
| EX | 1054 | 43.349 | 28.462 | 208 | 25.813 | 19.169 |  |  |  |
| INF | 1050 | 5.179 | 12.147 | 213 | 7.557 | 5.378 |  |  |  |
| UNEM | 1032 | 7.946 | 4.21 | 222 | 4.707 | 3.766 |  |  |  |

Table 1 represents the means and standard deviations dependent and independent variables of 14 international alliances countries.

In case of foreign direct investment, NAFTA countries have highest mean values (90,000 million USD) of FDI among the 14 regions used in this study, whereas African Union countries have the lowest mean value (532 million USD) of FDI. NAFTA countries’ average gross domestic product (4780 billion USD) is highest and African Union is the lowest GDP (23.7 billion USD) of all regions of this study.

BIMSTEC countries have the highest average GCF (31 point 595 percent of GDP) whereas African Union countries have lowest average GCF (21 point 218 percent of GDP) of all regions used in this study. African Union countries have highest mean value of Agriculture, forestry, and fishing (22 point 922 percent GDP) and G7 countries have the lowest mean value of Agriculture, forestry, and fishing ( 1 point 469 percent).

APEC countries have highest mean value of value added of industry (36 point 766 percent of GDP) and SAFTA countries have lowest mean value of value added of industry (24 point 064 percent of GDP). ASEAN countries have highest average of import of goods and services (60 point 892 percent of GDP) whereas BRICS countries imported lowest (19 point 852 percent of GDP) of all the regions used in this study. ASEAN countries have highest average of export of goods and services (64 point 198 percent of GDP) whereas BRICS countries exported lowest (21 point 844 percent of GDP). Finally, BRICS countries have highest inflation rate and unemployment rate whereas G7 countries have the lowest inflation rate and ASEAN countries have lowest unemployment rate of the regions used in this study.

* 1. **Comparative determinants analysis of 14 alliances**

Table 2: Comparative determinants analysis of 14 alliances

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | African Union | APEC | Arab League | ASEAN | BIMSTEC | BRI | BRICS | EU | G7 | G20 | | GATT | NAFTA | OECD | SAFTA |
| lnGDP | 0.443\*\*\* | 1.023\*\*\* | 0.070 | 0.598\*\*\* | 1.269\*\*\* | 0.371\*\*\* | 2.519\*\*\* | 0.333\*\* | 0.805 | 2.100\*\*\* | | 2.770\*\*\* | 1.111\*\*\* | 0.564\*\*\* | 1.257\*\*\* |
|  | (0.067) | (0.197) | (0.091) | (0.171) | (0.157) | (0.041) | (0.582) | (0.148) | (1.221) | (0.482) | | (0.364) | (0.116) | (0.148) | (0.117) |
| lnGCF | 0.440 | -1.487\* | 1.690\*\* | 0.204 | -0.211 | 1.047\*\*\* | 4.569 | 1.252 | -8.362\* | 0.587 | | 4.845\*\*\* | 1.225 | 0.112 | -0.360 |
|  | (0.389) | (0.758) | (0.709) | (0.557) | (1.012) | (0.177) | (3.984) | (1.574) | (5.027) | (2.223) | | (1.693) | (0.876) | (1.469) | (0.577) |
| lnAFFva | -0.198 | 0.033 | -0.252 | -0.956\*\*\* | -6.883\*\*\* | -0.368\*\* | 1.996\*\* | 0.475 | 1.749 | 0.628 | | 1.306\*\* | -0.191 | -0.707 | -4.404\*\*\* |
|  | (0.300) | (0.246) | (0.512) | (0.297) | (0.851) | (0.147) | (0.993) | (0.755) | (1.810) | (0.714) | | (0.644) | (0.296) | (0.603) | (1.011) |
| lnInva | 0.916\*\* | -0.154 | -0.467 | -1.840 | -1.718 | 0.020 | -7.890\*\* | 0.803 | -0.905 | -0.825 | | 0.197 | 0.177\*\* | 1.596\*\*\* | 1.114 |
|  | (0.361) | (0.350) | (0.386) | (1.427) | (1.649) | (0.186) | (3.355) | (0.572) | (0.602) | (0.558) | | (0.551) | (0.074) | (0.424) | (1.155) |
| lnIM | 2.106\*\*\* | 3.501\*\* | 2.069\* | 2.029 | -1.630 | 0.406 | -8.541\*\* | 0.050 | 10.652\* | 9.600\*\*\* | | 5.972\*\*\* | 0.362 | 2.724 | 0.772 |
|  | (0.644) | (1.581) | (1.170) | (1.888) | (1.782) | (0.370) | (3.539) | (3.563) | (5.436) | (2.289) | | (1.856) | (0.800) | (2.679) | (1.340) |
| lnEX | -3.032\*\*\* | -1.668 | -0.801 | -1.992 | 0.157 | 0.141 | 7.948\*\*\* | -1.965 | -7.840 | -8.325\*\*\* | | -4.099\*\*\* | 0.425 | -5.294\*\* | -1.676 |
|  | (0.655) | (1.529) | (1.174) | (2.098) | (1.902) | (0.396) | (2.859) | (3.222) | (5.488) | (2.024) | | (1.399) | (0.687) | (2.406) | (1.391) |
| lnINF | -0.322\*\* | -0.398\* | 0.024 | 0.006 | 0.590 | -0.033 | 0.127 | 0.037 | -0.557 | 0.174 | | 0.592 | 0.015 | 0.509 | 0.746 |
|  | (0.164) | (0.222) | (0.297) | (0.310) | (0.615) | (0.101) | (0.247) | (0.351) | (0.815) | (0.309) | | (0.371) | (0.118) | (0.321) | (0.548) |
| lnUNEM | 0.680\*\* | -0.220 | 0.042 | -1.951\*\*\* | 0.557 | 0.252 | 3.607\*\*\* | 2.019\*\*\* | -0.469 | 1.212\* | | 1.596\*\*\* | -0.133 | 1.849\*\*\* | 1.047\*\* |
|  | (0.307) | (0.496) | (0.578) | (0.584) | (0.529) | (0.160) | (0.680) | (0.622) | (1.263) | (0.625) | | (0.553) | (0.138) | (0.555) | (0.492) |
| Standard errors are in parenthesis | | | | | | | | | | | |
| *\*\*\* p<0.01, \*\* p<0.05, \* p<0.1* | | | | | | | | | | | |

In Table 2 described Second Stage Least square Method (2SLS), foreign direct investment has positive impact on gross domestic product in all regions except Arab League and G7. In case of GCF and FDI, Arab League, BRI, GATT countries have significant positive relationship and APEC, G7 countries have significant negative relationship. In case of value added of AFF and FDI, BRICS, GATT countries have significant positive relationship and ASEAN, BIMSTEC, SAFTA countries have significant negative relationship. In case of value added of industry and FDI, African Union, NAFTA, OECD countries have significant positive relationship and BRICS countries have significant negative relationship. In case of import of goods and services and FDI, African Union, APEC, G20, GATT countries has significant positive relationship and BRICS countries have significant negative relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and African Union, G20, GATT, OECD countries have significant negative relationship. In case of inflation and FDI, African Union, APEC countries have significant negative relationship. In case of unemployment and FDI, African Union, BRICS, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

**Table 3: Comparative model analysis**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Models** | **OLS** | | **POLS** | | **DK** | | **2SLS** | | **GMM** | |
| **Variables** | **(1)**  **Positive Relationship** | **(2)**  **Negative Relationship** | **(3)**  **Positive Relationship** | **(4)**  **Negative Relationship** | **(5)**  **Positive Relationship** | **(6)**  **Negative Relationship** | **(7)**  **Positive Relationship** | **(8)**  **Negative Relationship** | **(9)**  **Positive Relationship** | **(10)**  **Negative Relationship** |
| lnGDP | All except G7 |  | All except Arab League and EU |  | All except Arab League and G7 |  | All except Arab League and G7 |  | African Union, APEC, BRI, BRICS, GATT, OECD |  |
| lnGCF | Arab League, BRI, GATT | APEC, G7 | BRI | G7 | Arab League, BRI, GATT, NAFTA | APEC | Arab League, BRI, GATT | APEC, G7 | BRI |  |
| lnAFFva | BRICS,GATT | ASEAN, BIMSTEC, BRI, SAFTA | BRICS | Afrian Union, ASEAN, BIMSTEC, BRI, SAFTA | GATT | ASEAN, BIMSTEC, SAFTA | BRICS, GATT | ASEAN, BIMSTEC, SAFTA |  | BRICS |
| lnInva | African Union, NAFTA, OECD | BRICS | African Union, BRI, NAFTA, OECD | BRICS | OECD | G7, G20 | African Union, NAFTA, OECD | BRICS | OECD |  |
| lnIM | African Union, APEC, Arab League, G7, G20, GATT | BRICS | African Union, ASIAN, BRI, G7 | BRICS | African Union, APEC, G7, G20, GATT |  | African Union, APEC, G20, GATT | BRICS | G20 |  |
| lnEX | BRICS | African Union, G20, GATT, OECD | BRICS | African Union, ASEAN, BRI | BRICS | African Union, G20, GATT, OECD, SAFTA | BRICS | African Union, G20, GATT, OECD | BRICS | OECD |
| lnINF |  | Afrian Union, APEC |  | Afrian Union, APEC | GATT, SAFTA | Afrian Union |  | Afrian Union, APEC |  |  |
| lnUNEM | African Union, BRICS, EU, G20, GATT, OECD, SAFTA | ASEAN | BRI, BRICS, EU, GATT, OECD, SAFTA | ASEAN | EU, G20, GATT, OECD, SAFTA | ASEAN | African Union, BRICS, EU, G20, GATT, OECD, SAFTA | ASEAN | OECD | ASEAN |

Table 3 Column (1) and (2), In Ordinary Least Square Method (OLS) foreign direct investment has positive impact on gross domestic product in all regions except G7. In case of Arab League, BRI, GATT countries, FDI have significant positive relationship with GCF. On the other hand, APEC, G7 have the significant negative relationship with FDI and GCF. In case of AFF and FDI, BRICS,GATT countries has significant positive relationship and ASEAN, BIMSTEC, BRI, SAFTA countries have significant negative relationship. In case of value added of industry and FDI, African Union, NAFTA, OECD countries has significant positive relationship and BRICS countries have significant negative relationship. In case of import of goods and services and FDI, African Union, APEC, Arab League, G7, G20, GATT countries has significant positive relationship and BRICS countries have significant negative relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and African Union, G20, GATT, OECD countries have significant negative relationship. In case of inflation and FDI, African Union, APEC countries have significant negative relationship. . In case of unemployment and FDI, African Union, BRICS, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

Table 3 Column (3) and (4), In Pooled Ordinary Least Square Method (POLS) foreign direct investment has positive impact on gross domestic product in all regions except Arab League and EU. In case of GCF and FDI, BRI countries have significant positive relationship and G7 countries have significant negative relationship. In case of value added of AFF and FDI, BRICS countries have significant positive relationship and African Union, ASEAN, BIMSTEC, BRI, SAFTA countries have significant negative relationship. In case of value added of industry and FDI, African Union, BRI, NAFTA, OECD countries has significant positive relationship and BRICS countries have significant negative relationship. In case of import of goods and services and FDI, African Union, ASIAN, BRI, G7 countries has significant positive relationship and BRICS countries have significant negative relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and African Union, ASEAN, BRI countries have significant negative relationship. In case of inflation and FDI, African Union, APEC countries have significant negative relationship. In case of unemployment and FDI, BRI, BRICS, EU, GATT, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

Table 3 Column (5) and (6), In Driscoll-Kraay Method (DK) foreign direct investment has positive impact on gross domestic product in all regions except Arab League and G7. In case of GCF and FDI, Arab League, BRI, GATT, NAFTA countries have significant positive relationship and APEC countries have significant negative relationship. In case of value added of AFF and FDI, GATT countries have significant positive relationship and ASEAN, BIMSTEC, SAFTA countries have significant negative relationship. In case of value added of industry and FDI, OECD countries have significant positive relationship and G7 and G20 countries have significant negative relationship. In case of import of goods and services and FDI, African Union, APEC, G7, G20, GATT countries has significant positive relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and African Union, G20, GATT, OECD, SAFTA countries have significant negative relationship. In case of inflation and FDI, GATT, SAFTA countries have significant positive relationship and African Union countries have significant negative relationship. In case of unemployment and FDI, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

Table 3 Column (7) and (8), In Second Stage Least square Method (2SLS), foreign direct investment has positive impact on gross domestic product in all regions except Arab League and G7. In case of GCF and FDI, Arab League, BRI, GATT countries have significant positive relationship and APEC, G7 countries have significant negative relationship. In case of value added of AFF and FDI, BRICS, GATT countries have significant positive relationship and ASEAN, BIMSTEC, SAFTA countries have significant negative relationship. In case of value added of industry and FDI, African Union, NAFTA, OECD countries have significant positive relationship and BRICS countries have significant negative relationship. In case of import of goods and services and FDI, African Union, APEC, G20, GATT countries has significant positive relationship and BRICS countries have significant negative relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and African Union, G20, GATT, OECD countries have significant negative relationship. In case of inflation and FDI, African Union, APEC countries have significant negative relationship. In case of unemployment and FDI, African Union, BRICS, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

Table 3 Column (9) and (10), In Generalized Methods of Moments (GMM) Methods, foreign direct investment has positive impact on gross domestic product in African Union, APEC, BRI, BRICS, GATT, OECD countries. In case of GCF and FDI, BRI countries have significant positive relationship. In case of value added of AFF and FDI, BRICS countries have significant negative relationship. In case of value added of industry and FDI, OECD countries have significant positive relationship in case of import of goods and services and FDI, G20 countries has significant positive relationship. In case of export of goods and services and FDI, BRICS countries have significant positive relationship and OECD countries have significant negative relationship. In case of unemployment and FDI, OECD, SAFTA countries have significant positive relationship and ASEAN countries have significant negative relationship.

1. **Conclusion:**

Finally, it is found that foreign direct investment and gross domestic product have the positive relationship among all the regions except G7 in OLS method, except Arab League and EU in POLS method, except Arab League and G7 in DK and 2SLS methods. On the other hand, in GMM methods, only African Union, APEC, BRI, BRICS, GATT, OECD countries have significant positive relationships between FDI and GDP.

In case of gross capital formation and foreign direct investment, Arab League, BRI, GATT countries have significant positive relationships and APEC, G7 countries have significant negative relationships in OLS method. In FDI and GCF, BRI countries have significant positive and G7 countries have significant negative relationship in POLS method, Arab League, BRI, GATT, NAFTA have significant positive and APEC countries have significant negative relationship in DK method, Arab League, BRI, GATT countries have significant positive and APEC, G7 countries have significant negative relationship in 2SLS method and BRI countries have significant positive relationship in GMM method.

In case of value addition of agriculture, forestry and fishing and foreign direct investment, BRICS, GATT countries have significant positive relationships and ASEAN, BIMSTEC, BRI, SAFTA countries have significant negative relationships in OLS method. In FDI and AFFva, BRICS countries have significant positive and African Union, ASEAN, BIMSTEC, BRI, SAFTA countries have significant negative relationship in POLS method, GATT countries have significant positive and ASEAN, BIMSTEC, SAFTA countries have significant negative relationship in DK method, BRICS, GATT countries have significant positive and ASEAN, BIMSTEC, SAFTA countries have significant negative relationship in 2SLS method and BRICS countries have significant negative relationship in GMM method.

In case of value addition of industry and foreign direct investment, African Union, NAFTA, OECD countries have significant positive relationship in OLS method, African Union, BRI, NAFTA, OECD countries have significant positive relationship in POLS method, African Union, NAFTA, OECD countries have significant positive relationship in 2SLS method, OECD countries have significant positive relationship in both DK and GMM methods. On the other hand, in case of value addition of industry and foreign direct investment, only BRICS countries have significant negative relationship in OLS, POLS and 2SLS methods and G7, G20 countries have significant negative relationship in DK methods.

In case of import of goods & services and foreign direct investment, African Union, APEC, Arab League, G7, G20, GATT countries have significant positive relationship in OLS method, African Union, ASIAN, BRI, G7 countries have significant positive relationship in POLS method, African Union, APEC, G20, GATT countries have significant positive relationships in DK method, African Union, APEC, G7, G20, GATT countries have significant positive relationship in 2SLS method, G20 countries have significant positive relationship in GMM methods. On the other hand, in case of value addition of industry and foreign direct investment, only BRICS countries have significant negative relationship in OLS, POLS and 2SLS methods.

In case of export of goods & services and foreign direct investment, BRICS countries have significant positive relationship in all methods. On the other hand, African Union, G20, GATT, OECD countries have significant negative relationships in OLS methods, African Union, ASEAN, BRI countries have significant negative relationships in POLS method, African Union, G20, GATT, OECD, SAFTA countries have significant negative relationships in DK method, African Union, G20, GATT, OECD countries have significant negative relationships in 2SLS method, OECD countries have significant negative relationships in GMM method.

In case of inflation and foreign direct investment, GATT and SAFTA countries have significant positive relationship in DK method. On the other hand, African Union, APEC countries have significant negative relationships in OLS, POLS, 2SLS methods and only African Union countries have significant negative relationships in DK method.

In case of unemployment rate and foreign direct investment, African Union, BRICS, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship in OLS method, BRI, BRICS, EU, GATT, OECD, SAFTA countries have significant positive relationship in POLS method, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship in DK method, African Union, BRICS, EU, G20, GATT, OECD, SAFTA countries have significant positive relationship in 2SLS method and OECD countries have significant positive relationship in GMM method. On the other hand, ASEAN countries have significant negative relationships in all methods.

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Appendices:

1. OLS

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | African Union | APEC | Arab League | ASEAN | BIMSTEC | BRI | BRICS | EU | G7 | G20 | GATT | NAFTA | OECD | SAFTA |
| lnGDP | 0.443\*\*\* | 1.023\*\*\* | 0.07 | 0.598\*\*\* | 1.269\*\*\* | 0.371\*\*\* | 2.519\*\*\* | 0.333\*\* | 0.805 | 2.100\*\*\* | 2.770\*\*\* | 1.111\*\*\* | 0.564\*\*\* | 1.257\*\*\* |
|  | -0.067 | -0.197 | -0.091 | -0.171 | -0.157 | -0.041 | -0.582 | -0.148 | -1.221 | -0.482 | -0.364 | -0.116 | -0.148 | -0.117 |
| lnGCF | 0.44 | -1.487\* | 1.690\*\* | 0.204 | -0.211 | 1.047\*\*\* | 4.569 | 1.252 | -8.362\* | 0.587 | 4.845\*\*\* | 1.225 | 0.112 | -0.36 |
|  | -0.389 | -0.758 | -0.709 | -0.557 | -1.012 | -0.177 | -3.984 | -1.574 | -5.027 | -2.223 | -1.693 | -0.876 | -1.469 | -0.577 |
| lnAFFva | -0.198 | 0.033 | -0.252 | -0.956\*\*\* | -6.883\*\*\* | -0.368\*\* | 1.996\*\* | 0.475 | 1.749 | 0.628 | 1.306\*\* | -0.191 | -0.707 | -4.404\*\*\* |
|  | -0.3 | -0.246 | -0.512 | -0.297 | -0.851 | -0.147 | -0.993 | -0.755 | -1.81 | -0.714 | -0.644 | -0.296 | -0.603 | -1.011 |
| lnInva | 0.916\*\* | -0.154 | -0.467 | -1.84 | -1.718 | 0.02 | -7.890\*\* | 0.803 | -0.905 | -0.825 | 0.197 | 0.177\*\* | 1.596\*\*\* | 1.114 |
|  | -0.361 | -0.35 | -0.386 | -1.427 | -1.649 | -0.186 | -3.355 | -0.572 | -0.602 | -0.558 | -0.551 | -0.074 | -0.424 | -1.155 |
| lnIM | 2.106\*\*\* | 3.501\*\* | 2.069\* | 2.029 | -1.63 | 0.406 | -8.541\*\* | 0.05 | 10.652\* | 9.600\*\*\* | 5.972\*\*\* | 0.362 | 2.724 | 0.772 |
|  | -0.644 | -1.581 | -1.17 | -1.888 | -1.782 | -0.37 | -3.539 | -3.563 | -5.436 | -2.289 | -1.856 | -0.8 | -2.679 | -1.34 |
| lnEX | -3.032\*\*\* | -1.668 | -0.801 | -1.992 | 0.157 | 0.141 | 7.948\*\*\* | -1.965 | -7.84 | -8.325\*\*\* | -4.099\*\*\* | 0.425 | -5.294\*\* | -1.676 |
|  | -0.655 | -1.529 | -1.174 | -2.098 | -1.902 | -0.396 | -2.859 | -3.222 | -5.488 | -2.024 | -1.399 | -0.687 | -2.406 | -1.391 |
| lnINF | -0.322\*\* | -0.398\* | 0.024 | 0.006 | 0.59 | -0.033 | 0.127 | 0.037 | -0.557 | 0.174 | 0.592 | 0.015 | 0.509 | 0.746 |
|  | -0.164 | -0.222 | -0.297 | -0.31 | -0.615 | -0.101 | -0.247 | -0.351 | -0.815 | -0.309 | -0.371 | -0.118 | -0.321 | -0.548 |
| lnUNEM | 0.680\*\* | -0.22 | 0.042 | -1.951\*\*\* | 0.557 | 0.252 | 3.607\*\*\* | 2.019\*\*\* | -0.469 | 1.212\* | 1.596\*\*\* | -0.133 | 1.849\*\*\* | 1.047\*\* |
|  | -0.307 | -0.496 | -0.578 | -0.584 | -0.529 | -0.16 | -0.68 | -0.622 | -1.263 | -0.625 | -0.553 | -0.138 | -0.555 | -0.492 |
| L.lnFDI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| \_cons | 3.964\*\*\* | -5.754 | 6.378\*\*\* | 14.899\*\*\* | 16.872\*\*\* | 3.741\*\*\* | -44.390\*\* | 7.309\*\*\* | 19.839 | -42.527\*\*\* | -80.895\*\*\* | -13.448\*\*\* | 5.559\*\* | -2.278 |
|  | -1.235 | -5.45 | -2.095 | -1.844 | -2.704 | -0.788 | -17.014 | -2.462 | -41.821 | -13.592 | -11.052 | -4.481 | -2.765 | -1.891 |
| Obs. | 1508 | 580 | 609 | 290 | 203 | 3944 | 145 | 783 | 203 | 551 | 551 | 87 | 1073 | 232 |
| Pseudo R2 | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z |

1. POLS

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | African Union | APEC | Arab League | ASEAN | BIMSTEC | BRI | BRICS | EU | G7 | G20 | GATT | NAFTA | OECD | SAFTA |
| lnGDP | 0.387\*\*\* | 1.109\*\*\* | 0.04 | 0.913\*\*\* | 1.269\*\*\* | 0.315\*\*\* | 2.519\*\*\* | 0.215 | 0.805 | 1.767\*\* | 1.957\*\*\* | 1.111\*\*\* | 0.420\*\* | 1.257\*\*\* |
|  | -0.089 | -0.296 | -0.115 | -0.303 | -0.157 | -0.048 | -0.582 | -0.173 | -1.221 | -0.687 | -0.515 | -0.116 | -0.173 | -0.117 |
| lnGCF | 0.256 | -0.417 | -0.249 | 0.043 | -0.211 | 0.485\*\* | 4.569 | 2.454 | -8.362\* | 4.62 | 3.332 | 1.225 | 1.421 | -0.36 |
|  | -0.449 | -1.018 | -0.794 | -0.625 | -1.012 | -0.237 | -3.984 | -1.742 | -5.027 | -2.843 | -2.586 | -0.876 | -1.667 | -0.577 |
| lnAFFva | -0.752\* | -0.237 | 0.568 | -2.178\*\*\* | -6.883\*\*\* | 0.935\*\*\* | 1.996\*\* | -0.011 | 1.749 | -0.683 | 0.817 | -0.191 | -0.452 | -4.404\*\*\* |
|  | -0.435 | -0.401 | -0.65 | -0.727 | -0.851 | -0.233 | -0.993 | -0.876 | -1.81 | -1.12 | -0.984 | -0.296 | -0.729 | -1.011 |
| lnInva | 1.205\*\*\* | -0.176 | 0.103 | -2.484 | -1.718 | 0.497\*\* | -7.890\*\* | 0.845 | -0.905 | -0.484 | 0.372 | 0.177\*\* | 1.436\*\*\* | 1.114 |
|  | -0.434 | -0.395 | -0.46 | -2.462 | -1.649 | -0.225 | -3.355 | -0.585 | -0.602 | -0.595 | -0.578 | -0.074 | -0.445 | -1.155 |
| lnIM | 1.840\*\* | 1.374 | 0.379 | 5.139\*\* | -1.63 | 1.590\*\*\* | -8.541\*\* | -2.071 | 10.652\* | 3.891 | -0.07 | 0.362 | -0.459 | 0.772 |
|  | -0.788 | -2.135 | -1.406 | -2.303 | -1.782 | -0.48 | -3.539 | -4.285 | -5.436 | -2.975 | -2.598 | -0.8 | -3.253 | -1.34 |
| lnEX | -2.484\*\*\* | -0.367 | 1.777 | -5.171\*\* | 0.157 | -1.197\*\* | 7.948\*\*\* | -0.219 | -7.84 | -3.832 | 0.144 | 0.425 | -2.45 | -1.676 |
|  | -0.792 | -1.893 | -1.378 | -2.497 | -1.902 | -0.491 | -2.859 | -3.823 | -5.488 | -2.594 | -2.045 | -0.687 | -2.893 | -1.391 |
| lnINF | -0.298\* | -0.479\*\* | 0.232 | 0.267 | 0.59 | -0.101 | 0.127 | 0.178 | -0.557 | -0.345 | 0.063 | 0.015 | 0.473 | 0.746 |
|  | -0.174 | -0.242 | -0.29 | -0.328 | -0.615 | -0.101 | -0.247 | -0.36 | -0.815 | -0.338 | -0.393 | -0.118 | -0.335 | -0.548 |
| lnUNEM | 0.628 | -0.478 | 0.136 | -1.716\*\* | 0.557 | 1.269\*\*\* | 3.607\*\*\* | 2.304\*\*\* | -0.469 | 0.889 | 1.474\*\* | -0.133 | 1.849\*\*\* | 1.047\*\* |
|  | -0.413 | -0.589 | -0.717 | -0.76 | -0.529 | -0.231 | -0.68 | -0.66 | -1.263 | -0.707 | -0.712 | -0.138 | -0.599 | -0.492 |
| L.lnFDI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| \_cons | 5.556\*\*\* | -7.726 | 6.394\*\* | 12.208\*\*\* | 16.872\*\*\* | 4.939\*\*\* | -44.390\*\*\* | 7.602\*\*\* | 19.839 | -40.664\*\* | -47.549\*\*\* | -13.448\*\*\* | 6.767\*\* | -2.278 |
|  | -1.669 | -8.269 | -2.81 | -2.968 | -2.704 | -0.96 | -17.014 | -2.572 | -41.82 | -17.943 | -15.381 | -4.481 | -2.92 | -1.891 |
| Obs. | 1508 | 580 | 609 | 290 | 203 | 3944 | 145 | 783 | 203 | 551 | 551 | 87 | 1073 | 232 |
| Pseudo R2 | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z |

1. DK

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | African Union | APEC | Arab League | ASEAN | BIMSTEC | BRI | BRICS | EU | G7 | G20 | GATT | NAFTA | OECD | SAFTA |
| lnGDP | 0.443\*\*\* | 1.023\*\*\* | 0.07 | 0.598\*\*\* | 1.269\*\*\* | 0.371\*\*\* | 2.519\*\*\* | 0.333\*\* | 0.805 | 2.100\*\*\* | 2.770\*\*\* | 1.111\*\*\* | 0.564\*\*\* | 1.257\*\*\* |
|  | -0.095 | -0.234 | -0.129 | -0.196 | -0.187 | -0.057 | -0.612 | -0.123 | -0.935 | -0.305 | -0.406 | -0.066 | -0.141 | -0.119 |
| lnGCF | 0.44 | -1.487\* | 1.690\*\* | 0.204 | -0.211 | 1.047\*\*\* | 4.569 | 1.252 | -8.362\* | 0.587 | 4.845\*\*\* | 1.225\* | 0.112 | -0.36 |
|  | -0.361 | -0.742 | -0.816 | -0.453 | -0.552 | -0.234 | -7.171 | -1.445 | -4.819 | -2.006 | -1.114 | -0.602 | -1.056 | -0.373 |
| lnAFFva | -0.198 | 0.033 | -0.252 | -0.956\*\* | -6.883\*\*\* | -0.368 | 1.996\* | 0.475 | 1.749 | 0.628 | 1.306\*\* | -0.191 | -0.707 | -4.404\*\*\* |
|  | -0.323 | -0.325 | -0.579 | -0.392 | -1.352 | -0.317 | -1.108 | -1.239 | -1.814 | -0.859 | -0.533 | -0.246 | -0.806 | -1.35 |
| lnInva | 0.916 | -0.154 | -0.467 | -1.84 | -1.718 | 0.02 | -7.89 | 0.803 | -0.905\*\* | -0.825\*\* | 0.197 | 0.177\* | 1.596\*\*\* | 1.114 |
|  | -0.565 | -0.11 | -0.5 | -1.701 | -2.58 | -0.369 | -7.476 | -0.578 | -0.416 | -0.346 | -0.486 | -0.087 | -0.402 | -1.335 |
| lnIM | 2.106\*\*\* | 3.501\* | 2.069 | 2.029 | -1.63 | 0.406 | -8.541 | 0.05 | 10.652\*\* | 9.600\*\*\* | 5.972\*\*\* | 0.362 | 2.724 | 0.772 |
|  | -0.689 | -1.76 | -1.485 | -3.113 | -1.187 | -0.347 | -7.933 | -4.512 | -4.852 | -3.283 | -1.564 | -0.871 | -1.93 | -0.755 |
| lnEX | -3.032\*\*\* | -1.668 | -0.801 | -1.992 | 0.157 | 0.141 | 7.948 | -1.965 | -7.84 | -8.325\*\* | -4.099\*\*\* | 0.425 | -5.294\*\*\* | -1.676\*\* |
|  | -1.007 | -2.186 | -1.436 | -3.332 | -1.611 | -0.353 | -6.402 | -3.769 | -5.125 | -3.919 | -1.176 | -0.761 | -1.727 | -0.814 |
| lnINF | -0.322\*\* | -0.398 | 0.024 | 0.006 | 0.59 | -0.033 | 0.127 | 0.037 | -0.557 | 0.174 | 0.592\*\* | 0.015 | 0.509 | 0.746\*\*\* |
|  | -0.144 | -0.407 | -0.429 | -0.63 | -0.515 | -0.123 | -0.397 | -0.429 | -0.777 | -0.298 | -0.262 | -0.107 | -0.38 | -0.253 |
| lnUNEM | 0.68 | -0.22 | 0.042 | -1.951\*\* | 0.557 | 0.252 | 3.607 | 2.019\*\*\* | -0.469 | 1.212\*\*\* | 1.596\*\*\* | -0.133 | 1.849\*\*\* | 1.047\*\*\* |
|  | -0.469 | -0.493 | -0.906 | -0.848 | -0.683 | -0.339 | -2.407 | -0.471 | -1.095 | -0.423 | -0.448 | -0.108 | -0.573 | -0.292 |
| L.lnFDI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| \_cons | 3.964\* | -5.754 | 6.378\*\* | 14.899\*\*\* | 16.872\*\*\* | 3.741\*\*\* | -44.390\*\* | 7.309\*\*\* | 19.839 | -42.527\*\*\* | -80.895\*\*\* | -13.448\*\*\* | 5.559\*\*\* | -2.278 |
|  | -2.269 | -6.261 | -2.878 | -2.962 | -1.839 | -0.936 | -16.338 | -2.322 | -26.791 | -7.186 | -13.505 | -3.068 | -1.866 | -2.192 |
| Obs. | 1508 | 580 | 609 | 290 | 203 | 3944 | 145 | 783 | 203 | 551 | 551 | 87 | 1073 | 232 |
| Pseudo R2 | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z |

1. GMM

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | African Union | APEC | Arab League | ASEAN | BIMSTEC | BRI | BRICS | EU | G7 | G20 | GATT | NAFTA | OECD | SAFTA |
| lnGDP | 0.447\*\*\* | 1.083\*\*\* | 0.666 | -25.609 | -0.319 | 0.333\*\*\* | 1.864\*\* | 0.415 | -2.27 | -0.256 | 1.203\* | 0 | 0.586\*\* | -0.003 |
|  | -0.137 | -0.37 | -1.159 | -32.57 | -0.915 | -0.077 | -0.916 | -0.27 | -2.399 | -1.069 | -0.632 | 0 | -0.231 | -1.966 |
| lnGCF | 0.403 | 1.777 | 4.361 | 11.251 | 11.604 | 0.775\*\* | 0 | -0.23 | 0 | 1.834 | 1.718 | 0 | -0.27 | -3.007 |
|  | -0.529 | -3.984 | -5.299 | -13.226 | -11.545 | -0.342 | 0 | -1.92 | 0 | -4.653 | -4.788 | 0 | -2.436 | -83.37 |
| lnAFFva | -0.146 | 0.044 | -0.501 | -13.814 | 0 | -0.24 | -3.970\*\* | -0.71 | 66.571 | -0.687 | -0.008 | 0 | -0.78 | 4.542 |
|  | -0.409 | -0.219 | -3.658 | -12.799 | 0 | -0.187 | -2.013 | -1.46 | -114.41 | -0.979 | -1.355 | 0 | -0.971 | -12.86 |
| lnInva | 0.553 | -0.103 | -1.473 | 274.535 | 0 | 0.082 | 0 | 1.371 | 7.575 | -0.016 | 0.608 | -0.155 | 1.446\*\* | -13.38 |
|  | -0.709 | -0.486 | -2.026 | -347.62 | 0 | -0.304 | 0 | -1.06 | -7.648 | -0.658 | -0.517 | -0.151 | -0.674 | -35.2 |
| lnIM | 1.022 | -1.821 | -1.629 | 166.855 | 20.853 | -0.563 | 0 | -1.39 | 25.793 | 9.290\* | 5.261 | 0 | 2.574 | -2.377 |
|  | -1.361 | -8.972 | -2.841 | -210.61 | -38.034 | -0.616 | 0 | -3.15 | -53.254 | -5.076 | -8.527 | 0 | -2.771 | -15.62 |
| lnEX | -1.765 | 2.442 | 0.568 | -186.54 | -25.511 | 0.857 | 5.479\* | -0.04 | 0 | -5.068 | -5.572 | 0 | -5.155\*\* | 0 |
|  | -1.327 | -8.127 | -3.539 | -230.93 | -50.442 | -0.571 | -2.958 | -2.8 | 0 | -3.713 | -8.117 | 0 | -2.309 | 0 |
| lnINF | -0.226 | -0.087 | 0.546 | 1.374 | -2.616 | 0.09 | 0.616 | 0.31 | -10.638 | -0.062 | -0.005 | 0 | 0.499 | 15.526 |
|  | -0.218 | -0.252 | -0.711 | -2.731 | -3.124 | -0.139 | -0.467 | -0.4 | -29.797 | -0.201 | -0.338 | 0 | -0.381 | -10.39 |
| lnUNEM | 0.099 | -0.307 | -0.263 | -29.475 | 12.198 | 0.119 | 0 | 1.377 | -40.116 | 0.455 | 1.019 | 0.917 | 1.942\*\* | 36.61 |
|  | -0.569 | -0.821 | -7.013 | -27.496 | -12.735 | -0.293 | 0 | -1.36 | -65.771 | -1.734 | -0.925 | -0.578 | -0.932 | -24.58 |
| L.lnFDI | 0.223\*\*\* | 0.215\* | 0.258\*\*\* | -0.223 | -0.628 | 0.174\*\*\* | -1.696 | 0.105 | 2.272 | 0.133\* | 0.171 | 0.874\*\*\* | 0.05 | -0.383 |
|  | -0.08 | -0.117 | -0.087 | -0.474 | -0.613 | -0.042 | -1.336 | -0.07 | -1.817 | -0.077 | -0.157 | -0.101 | -0.061 | -0.3 |
| \_cons | 2.767 | -18.478 | -7.453 | -213.04 | 0 | 3.844\*\*\* | 0 | 6.794 | 0 | 8.127 | -23.17 | 0 | 5.784\*\* | 0 |
|  | -2.459 | -20.342 | -35.112 | -318.25 | 0 | -1.355 | 0 | -5.34 | 0 | -19.95 | -21.77 | 0 | -2.711 | 0 |
| Obs. | 1456 | 560 | 588 | 280 | 196 | 3808 | 140 | 756 | 196 | 532 | 532 | 84 | 1036 | 224 |
| Pseudo R2 | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z | .z |