

# A Gravity Model Approach for Determining Foreign Direct Investment Flows between India and the Gulf Cooperation Council (GCC) Countries

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## Abstract

The paper analysis the flows of Foreign Direct Investment and common factors that drive the Foreign Direct Investment flows between India and Gulf Cooperation Council countries, in this paper for empirical analysis of flow of FDI, gravity model of international trade executed, data is collected from the secondary sources from the year 2001 to 2022. The main objective of the paper is to know that how FDI is effect by the GDP of two regions like India and GCC countries and other determinants of FDI in this paper, finding of the paper describes factors like GDP of India and GCC countries and employment, real effective exchange rate of India as a regressor in the model are very deterministic for explaining the flow of FDI between India & GCC countries, and in future it will benefits the countries for their development and growth.

**Keywords:** GCC, FDI, Gravity Model, Trade, FGLS.**JEL Classification:** F14, F21, C33, C51

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## 1- INTRODUCTION

It was in the year 1990 when there was a financial disaster in India and the foreign reserves were depleting fast because of the Gulf War in 1990, and the oil prices were triggered. The balance of payment crisis ballooned into a disaster of confidence, which intensified in 1991 even though oil costs normalised. The foreign exchange reserves were sufficient for two weeks only. The Government had made reforms related to overseas change, overseas direct investment, portfolio funding, domestic alternatives, etc. Here the reforms are referred to as liberalisation. It means there were many relaxations in trade licensing, foreign direct investment, trade policies, and economic policies of an economy provided, and the control of the government was reduced over the economy's business activities, i.e., the open economy was adopted in 1991 and this was a big step by Government of India. In 1990, there were insufficient foreign reserves for the success of stability of payment. So, the economic development in India accompanied socialist-stimulated guidelines for most of its historical past. India's per capita profits multiplied within three decades post-independence. Since the mid-1980s, India has slowly spread out its` markets through monetary liberalisation because of the situation's demand. After more fundamental reforms since 1991, India has progressed closer to a free-market economy and

economic development resulting in consistent growth of Gross Domestic Product which was estimated by the IMF as 7.5 per cent in 2016-17. An essential factor in determining economic growth is capital formation. Foreign investment is crucial to economic development even as local investments increase the economy's capital stock. Significant alterations in global capital flows have been brought about by economic reforms and extensive political shifts. Technology and foreign capital play a major role in a country's socioeconomic development. Nowadays, no nation lives on an economic island. Every aspect of a nation's economy, including its businesses and sectors, trade in products and services, technology and capital availability, level of living, and other factors are connected with the international economy. This connection creates a complicated international movement of labour, capital, goods, and services. As the global economy grows increasingly interconnected, all nations have to accept this greater dependency. In the years after World War II, there was a sharp increase in global capital movements, particularly cross-border direct investment inflows, or Foreign Direct Investment (FDI). The positive feedback loop of investment driving growth and growth driving investment made it evident that increasing the growth rate necessitated a significant rate of rise in investment. Both public and private domestic resources have fallen short of this investment agreement. In this case, encouraging foreign direct and

foreign portfolio investments, or taking out a substantial international loan, were the choices for closing the significant savings-to-investment gap. Since FDI flows did not create debt, they were often preferred over other types of external financing. Additionally, their returns were contingent on the success of the projects that the investors had financed. Over the past 20 years, foreign direct investment (FDI) has acted as a complement to overall capital formation by bridging the gap between domestic savings and investment. FDI has a major contribution towards the success of globalization. Currently, foreign direct investment (FDI) accounts for a sizeable portion of domestic investment, employment creation, export, and related activities. Since FDI is anticipated to deliver cutting-edge technology and improve the economy's capacity for production, it is thought of as the biggest alluring kind of capital flow for emerging economies. Since it boosts GDP and creates more financial channels for resource exploitation, foreign direct investment (FDI) is regarded as a crucial sign of economic integration with the rest of the world. Additionally, international trade has a significant part in bolstering the economy as a crucial factor in the eyes of foreign investors, drawing in additional foreign direct investments. However, Gulf Cooperation Council countries are seeking to draw more FDI to improve the range of boom and decline in the amount of oil export inside the total GDP because in 1981 these nations unified their financial policy in this respect. Under Schedule 1 of the Foreign Exchange Management (Transfer or Issue of Security by a Person Resident outside India) Regulations 2000, Foreign Direct Investment (FDI) refers to an investment made in the capital of an Indian firm by a non-resident entity or individual who resides outside of India. Global FDI inflows have been increasing more quickly than global production, trade, and the rate of capital formation, among other economic variables. In 2001, FDI was valued at approximately US\$ 836,012 million; by 2012, it had grown to US\$ 1,350,926 million. Since the early 1980s, FDI inflow has increased at an accelerating rate, and global markets for it have gotten more competitive. Developing nations have been drawing more and more attention as investment destinations. India was one of the two main developing global giants and had one of the fastest-expanding economies in the world. India's liberalisation and globalisation of its economy began in July 1991, and since then, several of its economic sectors have been progressively opened to foreign investment. The Indian government has acknowledged the crucial role that foreign direct investment (FDI) plays in the country's economic growth process.

The factors influencing FDI are diverse and exhibit variations among foreign investors in different countries. The extensive and contentious literature on FDI determinants includes studies examining the location decisions of source country firms and others focusing on factors associated with the host country. Various factors contribute to the attraction of FDI in a

host country. The determinants of FDI specifically focused between India are GCC:

**Size of Market:** Market size, measured by GDP, per capita income, and middle-class population, is a key factor influencing Foreign Direct Investment (FDI). While India is seen as a large market, multinational firms consider factors like the purchasing power of Indian consumers, which may be lower compared to other countries.

**Infrastructure:** Infrastructure, encompassing elements like transportation, power generation, and telecommunications, is a critical factor influencing Foreign Direct Investment (FDI). Well-established and quality infrastructure not only determines FDI inflows but also serves as a host sector attracting FDI. Poor infrastructure can act as a deterrent, while robust infrastructure presents opportunities for foreign investors. India, despite being a developing country, has made efforts to enhance infrastructure through initiatives like Special Economic Zones, focusing on constructing essential elements like roads, transportation, information and communication networks, power, and legal systems to facilitate business activities.

**Political Stability:** Another major determinant influences FDI inflows. Stability in economic and socio policies framed by India has attracted investors across the border. If the government makes changes in policies that business is affected by the business deployed. This causes reluctance to foreign investors towards the investment climate of the host country.

**Legal and Regulatory Framework:** Clear and robust rules and regulations play a crucial role in attracting Foreign Direct Investment (FDI). These regulations encompass a broad spectrum, including the protection of property rights, the ability to repatriate profits, and a free-market currency exchange. Transparent foreign investment policies that avoid discrimination between domestic and foreign corporations are essential. In India, the 1991 Industrial Policy Statement outlines two routes for foreign investment approval: the automatic route and government approval. The equity participation limit does not exceed 51%, with an extended approval limit of 74% for nine priority industries.

**Cost of Labor:** Labor cost significantly affects total production costs and productivity for firms. In Foreign Direct Investment (FDI) decisions, investors consider factors like a country's labor cost, labor market efficiency, education and skills levels, and the impact of labor taxes. The tax structure, influencing firm costs, is crucial in shaping foreign investment decisions. A unified and lower tax regime is key for facilitating smooth movement of people and goods.

**Exchange Rate:** When assessing a country's business climate, it's crucial to consider factors such as tax

policies, the overall economic and financial environment, and favorable exchange rates. The stability and value retention of the local currency are vital. Currency depreciation can enhance the purchasing power of foreign investors, making it an important consideration for Foreign Direct Investment (FDI). Significant fluctuations in exchange rates can impact the price of host country assets, the value of repatriated profits, and the competitiveness of exports.

**Corruption:** The level of corruption in a country has a significant impact on both domestic and foreign investment. Studies consistently show that corruption has a negative effect on Foreign Direct Investment (FDI). Corruption introduces opacity and increased costs, especially in dealings with government officials, such as obtaining local licenses and permits. Higher levels of corruption can deter foreign investors. Ensuring a corruption-free environment is crucial for building investor trust in a host country's integrity and its ability to maintain law and order.

**Trade Openness:** Trade Openness is another determinant of the flow of FDI. There is an embrace of the general perception that MNEs are being attracted by those countries, which manifest features of trade openness, as open economies can inculcate confidence in foreign investors to a greater extent by the rectitude of their better performance record and generally steady economic climate. Accordingly, openness to trade, like others, has also received appreciable support from the empirical literature that shows a positive effect and is supposed to have a significant influence on FDI inflows for any country.

**Research and Development:** Another crucial determinant that demands careful attention is Research and Development (R&D). Multinational Enterprises (MNEs) possess an expanding knowledge base for introducing new and standardized capital goods at reduced costs. The presence of skilled human capital is essential to drive technological advancements in the host country. If a country cannot fulfil this need, it can significantly impede the inflow of Foreign Direct Investment (FDI). R&D is a pivotal factor considered in the decision-making process for foreign direct investment.

## 2- LITERATURE REVIEW

In this paper, critical literature related to FDI is studied. A few of them are:

FDI inflows from the GCC countries play a crucial role in boosting India's economy by bringing in capital, technology, and expertise. These investments contribute to job creation, infrastructure development, and overall economic growth in India. There are several studies relating to the FDI inflows in India which explore the literature for this study some works are done by (Martínez-Zarzoso, 2013) in their article compares different estimation methods for gravity models with

heteroscedasticity and zero trade values, including PPML, GPML, NLS, and FGLS. Results show that PPML is less affected by heteroscedasticity, FGLS performs similarly to PPML, and GPML has the lowest bias and SEs in simulations without zero values. Model selection is crucial for each dataset. (Kaur *et al.*, 2024). "An analysis of Indian FDI inflows through an augmented gravity model: exploring new insights," India has seen a significant rise in foreign direct investment (FDI) due to government reforms, with a study analyzing factors influencing FDI inflows using econometric techniques like PPML and FGLS. Per capita GDP negatively affects FDI inflows, while FDI openness, capital formation, and exports positively impact FDI inflows in India, suggesting a focus on export-oriented sectors and updating bilateral investment treaties. (Javed & Javed, 2017) "A Panel Data Analysis of Foreign Direct Investment Inflows into India Since 1991 to 2015" The study highlights the challenges in defining and measuring foreign direct investment (FDI) in India, highlighting the influence of portfolio investors and round-tripping investments. These observations are crucial, given the significant drop in FDI inflows from 1991 to 2015. FDI is essential for India's economic reforms and growth. The government should formulate FDI policies to boost domestic production, savings, and exports by empowering states to attract FDI independently. Recent FDI inflows have had a substantial impact on India's economy. (Dorakh, 2020). "A gravity model analysis of FDI across EU member states." "Recent discussions on European integration highlight the benefits of increased foreign direct investment (FDI) in EU accession countries, attributing it to EU membership as a key FDI determinant. An augmented gravity model study found that FDI inflows significantly increased by approximately 23% between 1991 and 2017 after EU enlargement." (Mariev *et al.*, 2016). The paper "Is Russia successful in attracting foreign direct investment? Evidence based on gravity model estimation" "aims to assess Russia's success in attracting foreign direct investment (FDI) and identify partner countries that overinvest or underinvest in the Russian economy using the gravity model of FDI. The Poisson pseudo maximum likelihood method with instrumental variables is chosen as the best option for estimation. Factors influencing FDI flows include GDP values, distance between countries, institutional development, wage levels, regional economic unions, language, borders, and colonial relationships. Actual FDI inflows to Russia exceed potential values by 1.72 times, with large developed countries overinvesting and smaller countries underinvesting in the Russian economy." Southeast Asian countries like China, South Korea, and Japan have also been identified as underinvesting in the Russian economy, based on research findings from 2001 to 2011. (Singh, 2019). The paper "Foreign Direct Investment (FDI) Inflows in India" discusses India's rise as a top foreign investment destination since 2014, focusing on sectoral analysis of FDI inflows from 2000 to 2018. It highlights the positive impact of FDI spill-

overs in the country and the significant growth in FDI inflows in the service sector, particularly in financial, banking, insurance, and technology-related services. (Donghui *et al.*, 2018). The study “Trade Openness and FDI Inflows: A Comparative Study of Asian Countries” finds that increased trade openness positively impacts Foreign Direct Investment (FDI) inflows in India, Iran, and Pakistan from 1982 to 2012, suggesting that enhancing trade openness can lead to sustained FDI inflows and improve welfare. (R. Mishra & Palit, 2020) The paper “Role of FDI on Employment Scenario in India” discusses that employment generation is crucial for growth in developing countries. Still, the impact of FDI on job creation in India is complex. A study from 1991 to 2018 analyzed FDI's influence on employment, showing significant growth in the service sector. FDI has backward and forward linkages in creating jobs, with the service sector attracting the most FDI proposals and generating the highest job opportunities in India. However, FDI may not be the primary factor driving employment growth, suggesting the need for government policy measures to boost organized sector employment. (Khandare, 2016). “Employment generation in India: Role of GDP and FDI,” The study analyzed the relationship between GDP, FDI, & employment in India from 2001 to 2012 using ordinary least square regression. FDI had the highest compound annual growth rate, followed by GDP and employment. Positive relationships were found between FDI/GDP and employment, with significant coefficients and P values indicating their impact on employment generation. The study revealed that a one-unit increase in FDI or GDP in India led to a significant increase in employment. The P values of 0.0004 for FDI and 0.0002 for GDP showed the high significance of these variables in influencing employment. GDP was found to be more significant than FDI in impacting employment generation. Policy recommendations include “stabilizing monetary and fiscal policies in the long run to boost GDP and FDI,” thereby increasing employment opportunities in India. (Dua & Garg, 2015) “Macroeconomic Determinants of Foreign Direct Investment: Evidence from India” The study explores macroeconomic factors influencing FDI flows to India, finding that factors like a depreciating exchange rate, higher domestic returns, and better infrastructure attract FDI, while macroeconomic instability and trade openness have adverse effects. (Al-matari *et al.*, 2021) “Determinants of Foreign Direct Investment in GCC Countries: An Empirical Analysis” The paper aims to identify key determinants of Foreign

Direct Investment (FDI) in Gulf Cooperation Council (GCC) countries using a balanced data panel from 1995 to 2018. Ten explanatory variables were analyzed, showing positive associations of inflation, trade ratio, GDP, gross savings, and net foreign assets with FDI. Various regression methods were employed, revealing a negative association between international tourism and FDI. The study's unique focus on all GCC countries and inclusion of multiple FDI determinants contribute significantly to existing research in the field. (Sidhu & Dhingra, 2009) “Foreign Direct Investment Inflows to India: Growth and Forecasts” this paper examines India, like other developing countries, seeks foreign direct investment (FDI) to boost economic growth, currently holding a 1.25% share of global FDI inflows and attracting a significant portion of FDI in South Asia. FDI in India has a long history dating back to the mid-eighteenth century, evolving due to international and domestic factors, not just post-Independence or post-liberalization. A study analyzed FDI growth in India and other developing Asian countries, forecasting future trends using a Double Exponential Smoothing Model, with Saudi Arabia expected to have the fastest FDI growth in the next decade. While China may continue to attract the highest FDI inflows in the near future, India is projected to significantly increase its share of anticipated FDI inflows in developing Asia. (Goyal, 2017) “Effects of FDI Inflows in India: Growth Perspective” The paper examines the effects of FDI inflow in India from 2000 to 2017, identifying factors like market size, demand, labor force quality, and tax incentives, with Mauritius, Singapore, and Japan being major contributors, and sectors like services, telecommunications, and software attracting significant FDI. (Nadig & Viswanathan, 2023) “Foreign direct investment and macroeconomic factors: evidence from the Indian economy.” The World Investment Report 2017 projects a 15% increase in FDI inflows to developing Asian countries, with India being the second most preferred destination; a study finds a significant correlation between FDI and macroeconomic factors from 1978 to 2017. After Studies, some important Literature works on FDI clearly explain the studies done in the field of FDI from different country-level analyses on India's macroeconomic variables, but it also shows that the study of FDI between India and GCC are rare this paper studies the flows of FDI between India and GCC, and explain the some regressors that effect FDI flows.

### 3- FDI inflows from GCC to India:

Table 1: (\$ million)

Years	UAE	SAUDI	Oman	Kuwait	Qatar	Bahrain
2001	13.83	0.01	0.73	3.32	NA	0.25
2002	10.24	0.3	4.63	0.19	NA	0.42
2003	8.82	0.88	1.01	0.04	0.16	3.83
2004	29.26	5.93	12.63	1.58	0.08	6.9
2005	47.35	0.9	1.29	0.2	0	0.22
2006	242.48	0.04	1.06	2.68	NA	0.19



Years	UAE	SAUDI	Oman	Kuwait	Qatar	Bahrain
2007	215.74	7.07	31.34	0.03	0.02	9.57
2008	293.43	0.71	7.13	0.25	0	0.27
2009	625.31	13.11	3.35	8.35	0	0.86
2010	362.86	2.5	263.84	0.42	1.02	0.98
2011	220.83	2.18	10.78	1.65	0.49	0.24
2012	270.58	7.13	10.48	0.58	0.79	1.64
2013	283.94	0.35	4.42	4.16	1.79	2.89
2014	279.28	9.52	14.16	4.75	0.92	17.38
2015	521.88	8.66	49.88	2.21	0.65	4.38
2016	1196.82	16.12	16.77	14.97	17.71	87.43
2017	689.02	124.82	22.93	16.69	0.4	22.93
2018	721.45	10.21	34.67	10.19	4.05	5.82
2019	862.36	105.33	34.86	2.21	59.33	7.96
2020	3989.59	2816.42	21.16	7.42	159.88	3.62
2021	1130.84	0.69	10.74	5.97	199.02	0.57
2022	3289.77	17.27	29.78	2.89	49.85	2.06

Source: Ministry of Commerce and Industry

The table 1, provides a comprehensive overview of India's inward FDI from Gulf Cooperation Council (GCC) countries over a span of two decades, from 2001 to 2022. The data is presented in millions of US dollars and is categorized by the individual GCC countries, namely the United Arab Emirates (UAE), Saudi Arabia, Oman, Kuwait, Qatar, and Bahrain. This analysis will delve into the trends, patterns, and significant changes in India's FDI inflows from these countries during this period. The data exhibits a substantial increase in India's FDI inflows from GCC countries over the years. The FDI numbers have experienced significant fluctuations, with several years witnessing remarkable surges in investment from specific GCC nations. The UAE emerges as the leading source of FDI for India, consistently contributing a substantial portion of the total FDI inflows. Saudi Arabia also stands out as a significant contributor, especially in the later years. While UAE and Saudi Arabia have historically been the primary sources of FDI, there is a

noticeable increase in FDI from Qatar and Kuwait in recent years, signifying a shifting trend in investment patterns. The data illustrates fluctuating patterns in FDI inflows, with certain years experiencing remarkable surges, notably 2006, 2009, 2015, and 2020. The UAE consistently dominates as the primary source of FDI throughout the years, with a substantial surge in 2020, signifying a profound impact on India's economy. Saudi Arabia's influence as a key contributor to India's FDI becomes pronounced from 2014 onwards, with significant investments in the subsequent years. The data indicates a growing trend in FDI from Qatar and Kuwait, particularly in the last decade, signifying diversification in India's FDI sources. While Oman and Bahrain contribute to India's FDI, the numbers are relatively lower compared to UAE and Saudi Arabia, with fluctuations in their investment patterns.

#### 4- FDI outflows from India to GCC:

Table 2: (\$ million)

Years	UAE	SAUDI	Oman	Kuwait	Qatar	Bahrain
2001	1.02	0.13	NA	NA	8.33	NA
2002	NA	69.75	NA	0.12	41.31	0.07
2003	NA	83.59	0.32	NA	79.72	0.54
2004	0.05	5.19	NA	NA	183.43	0.72
2005	0.07	3.04	NA	NA	120.24	0.85
2006	1.14	16.06	2.63	7.73	208.05	NA
2007	6.32	7.96	75.7	91.68	826.04	0.21
2008	8.9	36.64	23.84	96.45	1382.7	0.1
2009	6.3	17.7	0.2	4.4	1461.5	NA
2010	10.9	140.53	6.2	1.2	1808.82	NA
2011	8.2	15.8	4.81	26.14	1341.4	0.1
2012	1.6	135.15	3.3	2.41	1463.3	NA
2013	2.2	101.1	4.1	269.22	1798.2	NA
2014	9.5	179.22	26.62	196.03	1449.8	2.44
2015	12.5	156.91	31.6	12.6	1540.25	NA
2016	6.0	202.2	0.78	236.2	2464.49	NA

Years	UAE	SAUDI	Oman	Kuwait	Qatar	Bahrain
2017	4.7	44.1	3.4	111.2	1130.6	NA
2018	1.8	299.4	9.8	228.01	1499.3	0.3
2019	2.3	48.7	13.34	1521.3	927.73	NA
2020	5.2	8.7	6.5	27.6	846.84	NA
2021	121.3	28.2	0.6	111.9	1088.8	NA
2022	8.2	23.2	8.4	133.4	2742.1	NA

**Source:** Ministry of Commerce and Industry

The table 2, "FDI outflows from India to GCC" presents data on Foreign Direct Investment (FDI) outflows from India to six Gulf Cooperation Council (GCC) countries over a span of 22 years, from 2001 to 2022. The GCC countries included are the United Arab Emirates (UAE), Saudi Arabia, Oman, Kuwait, Qatar, and Bahrain. The figures are listed in millions of US dollars (\$ million) and highlight the variations and trends in FDI outflows over this period. The FDI outflows to the UAE show significant fluctuations. From a modest beginning of \$1.02 million in 2001, the investments saw some peaks and troughs over the years. A notable peak occurred in 2021, with FDI outflows reaching \$121.3 million, which is significantly higher than in previous years. The FDI outflows to Saudi Arabia display considerable variability. The highest recorded outflow was in 2018 at \$299.4 million, while in some years, such as 2001 and 2020, the outflows were relatively low at \$0.13 million and \$8.7 million, respectively. FDI outflows to Oman were sporadic in the early years, with no data available for several initial years. The outflows started to pick up around 2006, peaking in 2007 at \$75.7 million. After fluctuating in the following years, there was another peak in 2019 with \$13.34 million. The investment trends in Kuwait show sporadic entries initially, with several years of no available data. A significant increase is seen in 2019 with FDI outflows reaching \$1521.3 million, which is the highest in the entire data set for Kuwait. FDI outflows to Qatar exhibit a consistent upward trend, especially from 2004 onwards. The outflows peaked in 2022 with \$2742.1 million, the highest value in the entire table for any country and year, showing a substantial interest in Qatar from Indian investors. The data for Bahrain is less frequent, with many years showing "NA". The available data indicate relatively small FDI outflows, with minor peaks in 2004 (\$0.72 million) and 2014 (\$2.44 million). The FDI outflows from India to the GCC countries have generally increased over the years, indicating growing economic ties and investment interests between India and these nations. The presence of "NA" in the table suggests incomplete data records for certain years and countries, which could be due to various factors such as reporting standards, data collection issues, or insignificant investment amounts not being recorded. Specific years stand out for each country with remarkably high FDI outflows. For instance, 2018 for Saudi Arabia, 2019 for Kuwait, and 2022 for Qatar, indicating periods of heightened investment activities possibly driven by economic opportunities or bilateral

agreements during those times. The UAE has been a consistently attractive destination for Indian FDI, with notable fluctuations. The significant peak in 2021 could be attributed to specific bilateral initiatives, enhanced economic cooperation, or investment opportunities arising from Expo 2020 Dubai. The highest FDI outflows in 2018 align with Saudi Arabia's Vision 2030, which aims to diversify its economy and attract foreign investments. This period saw reforms and incentives that likely attracted Indian investors. Investments in Oman saw a notable increase in the mid-2000s and another surge in 2019. These trends might reflect economic diversification efforts and projects in Oman attracting foreign investments. The dramatic spike in 2019 suggests a significant investment deal or project. Kuwait's strategic economic initiatives and efforts to improve its investment climate could have played a role. The consistent increase in FDI outflows to Qatar, culminating in a peak in 2022, reflects the country's robust economic strategies, infrastructure projects related to the 2022 FIFA World Cup, and its Vision 2030. The relatively low and infrequent FDI outflows to Bahrain suggest either limited investment opportunities or less emphasis on Bahrain as a key investment destination compared to other GCC countries. The table 2 provides a comprehensive overview of India's FDI outflows to GCC countries over two decades, highlighting trends, peaks, and the dynamic nature of investment flows. The data reflects broader economic relations, investment climates, and strategic priorities that shape the economic landscape between India and the GCC. The insights gained from this data can inform policymakers, businesses, and researchers about the evolving economic engagements and opportunities in this important region.

## 5- DATA SOURCES AND METHODOLOGY

Data Sources of variables in this paper are taken from world bank development indicators, the bruegel dataset, and the CEPII French Data Set. The period of the analysis is 2001 to 2022 with six GCC countries. The details of all the variables used in this research and their data sources are given in table 3. FDI is depicts the bilateral flow outward of Foreign Direct Investment from GCC countries to India and India to GCC countries from the year 2001 to 2022. For example FDI outflows from India to UAE is taken in particular year, and during the same year it returns from UAE to India, this will follow from 2001 to 2022 in one cross-section and the same will follow from 2001 to 2022 with remaining GCC countries in second cross-section. This will depict the two-way

outward flow of FDI between India and GCC, and this depict the data-set of gravity model of trade between the two countries. The paper uses OLS and PPML estimators for determining the gravity model of trade. The gravity model of trade in this paper contains some regressor that explain the effect of on FDI flows between the India and

GCC countries there are factors like employment in both regions that affect the flow of FDI, trade openness of India plays a major role in FDI flows. All these variables are discussed in the next part of the paper, there abbreviation and sources of the all the variables used in this paper are listed in the table 3.

**Table 3: Variables and Data Sources**

Variables	Code	Description and Data Source
Outward Foreign Direct Investment	OFDI	“https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=57437(\$ Millions)” “https://www.indiastat.com/”
Gross Domestic Product	GDP	GDP (current \$) “World Development Indicators   DataBank (worldbank.org)”
Distance	DIST	“http://www.cepii.fr/CEPII/en/publications/wp/abstract.asp?NoDoc=3877”
Common Ethnicity	CE	“http://www.cepii.fr/CEPII/en/publications/wp/BibTeX.asp?abstract=true&NoDoc=1823”
Common Colony	CC	“http://www.cepii.fr/CEPII/en/publications/wp/BibTeX.asp?NoDoc=3877”
Trade Openness India	TOIND	“https://databank.worldbank.org/source/world-development-indicators”
Employment	EMP	“https://databank.worldbank.org/source/world-development-indicators”

**Source:** Author’s Finding

**5.1 Methodology**

**Gravity Model Framework:** J. Tinbergen introduced this model to international trade in 1962. Similar to the universal Newtonian gravity model, “the gravity model of trade predicts bilateral trade flows between two regions that are directly proportional to the product of economic size (often using GDP or GNP) and inversely proportional to the distance between these two regions.” This paper analyses India’s OFDI determinants using a gravity model. Studies in the existing literature have employed the gravity model to empirically test the determinants of outward and inward FDI (Frenkel *et al.*, 2004); (Kahouli & Maktouf, 2015); (B. R. Mishra & Jena, 2019). This study follows the same approach. The paper uses an augmented standard gravity model. Enabling and resistive factors in the cross-border movement of goods, services, and factor inputs explain the gravity model’s suitability for evaluating India’s OFDI determinants. Due to its empirical robustness, the model is trendy for studying international trade, migration, services, and recently added investment flows. The primary gravity model and its augmented version, as used in this study, are given below.

*Base model equation*  $IFDI_{i,j} = GDP_i^a GDP_j^b / D_{i,j}^c \times M_{i,j}^d$  .....(1)

Where  $FDI_{ij}$  denotes the flow of FDI between two countries,  $GDP_i^a$  is GDP of Origin country and  $GDP_j^b$  is GDP of Destination Country,  $D_{i,j}^c$  is the Distance comprises physical geographic distance and cultural factors, which measure the resistance working in the direction of capital flows, goods and services, and cross-border factor input movements, and  $M_{i,j}^d$  is the variables of Interest in the model.

Linearised gravity model equation

$lnOFDI_{i,j} = a lnGDP_i + b lnGDP_j - c lnDistance_{i,j} + d lnM_{i,j}$  .....(2)

Augmented gravity model equations of Outward Foreign Direct Investment between GCC and India,

Equation.....3

$lnIFDI_{ijt} = \alpha + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} - \beta_3 lnDIST_{ijt} + \beta_4 CE_{ijt} + \beta_5 CC_{ijt} + \beta_6 lnEMP_{it} + \beta_7 lnEMP_{jt} + \beta_8 lnREER_{ij} + e_{ijt}$  ..... (3)

This Paper finds an augmented gravity model for India’s outward Foreign Direct Investment between all six GCC countries and India from 2001 to 2022. The augmented Gravity equations 3 above analyze the outflow of Foreign Direct Investment between India & GCC. Estimates are based on results using the pooled ordinary least squares (OLS) estimators and Feasible Generalized Least Square estimators (FGLS). The model equation is specified as OFDI (LNOFDI  $ijt$ ) from GCC (i) to India (j) at time t, and in that same time period it goes from India (i) to GCC (j) for all years from 2001 to 2022 this will be one cross section for India and one GCC member country and it goes as same for other countries in GCC, for different cross section in the data across same time period, in this paper this flow between india and GCC countries will considered as dependent variable and it is affected by the GCC country’s GDP (LNGDP $_{it}$ ), India’s GDP (LNGDP $_{jt}$ ), geographic distance (LNDIST $_{ijt}$ ), In addition, dummies are used to control for bilateral-specific effects. Common ethnicity (CE $_{ijt}$ ) equals one if 9% of the population of both countries speak the same language. Common Colony (CC $_{i,j}$ ) equals 1 when countries share a common colonizer after 1945. Employment in GCC countries (LNEMP $_{it}$ ) and

Employment in India (LNEMP<sub>jt</sub>) and last (LNREER<sub>ij</sub>), these all are regressor in the model.

**5.2 RESULTS**

Table 4, Breusch and Pagan Lagrangian multiplier test for heteroskedasticity is executed and by seeing the p-value of the test is less than 0.05, shows the problem of heteroscedasticity in the model, and for autocorrelation test the Wooldridge test is executed and its p-value is greater than the significance level, and the null hypothesis can be accepted and conclude that there is no serial auto correlation in the model, so we use generalized least square is used to tackle the problem of heteroscedasticity as the gravity model concerned with this problems. The results of the study found that it fulfills the theoretical aspect of the gravity model, and

results indicates that FDI flow between India and GCC countries is directly proportional to the sizes of the economy that is GDP<sub>i</sub> and GDP<sub>j</sub> or masses as per gravity model of trade, and Inversely proportional to the distance between them DIST<sub>ij</sub>.

The gravity model of international trade applied in this paper uses feasible generalized least square regression and ordinary least square regression to empirically get the results of the FDI flow between the two regions and how its affected by the GDP's of both the regions, before we began with the FGLS regression, we test the heteroskedasticity in the model and when the result shows that there is a problem of heteroskedasticity we go through the FGLS regression to resolve that issue. Meanwhile there is no issue of serial correlation in the panel.

**Table 4**

<p><b>“Breusch–Pagan/Cook–Weisberg test for heteroskedasticity</b>  <b>Assumption: Normal error terms”</b>  <b>Variable: Fitted values of LNFDI</b>  <b>H0: Constant variance</b></p>	<p><b>“Wooldridge test for autocorrelation in panel data”</b>  <b>“H0: no first order autocorrelation”</b></p>
<p>chi2(1) = 12.54</p>	<p>F (1, 11) = 2.731</p>
<p>Prob &gt; chi2 = 0.0004</p>	<p>Prob &gt; F = 0.1267</p>

**Source:** Author’s estimates in STATA 17

The result of pooled OLS and Feasible Generalized Least Square FGLS can be seen from the table 5, when there is a heteroscedasticity problem in the

panel we can go through the FGLS estimates, and this will explain the gravity analysis in the paper.

**Table 5: Results**

VARIABLES	OLS	FGLS
LNGDP i	1.22 (0.12) ***	1.24 (0.13) ***
LNGDP j	1.39 (1.12) ***	1.28 (0.14) ***
LNDIST i, j	-10.46 (0.77) ***	-9.8 (0.82) ***
CE	-2.87 (0.34) ***	-2.63 (0.40) ***
CC	1.82 (0.21) ***	1.98 (0.22) ***
LNEMP i	5.71 (0.86) ***	4.90 (0.87) ***
LNEMP j	6.93 (0.84) ***	5.75 (0.88) ***
LNREER i j	-3.99 (1.04) ***	-2.68 (1.17) **
CONST	-15.34 (8.73)	-16.40 (7.70) **
Observations	237	237
<b>R<sup>2</sup></b>	<b>0.67</b>	-

OLS: Estimates all covariates of Equation (3), FGLS: Estimates all covariates of Equation (3), The P-value read as follows \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

**Source:** Author’s Estimate in STATA 17

The interpretation of the gravity model equations using feasible generalized least square

demonstrates the relationship and impact of explanatory variables on the dependent variable (Outward Foreign



Direct Investment). Table 5, the first independent variable in equation (3), i.e., GDP of origin countries (i). The variable is statistically significant because the p-value is less than 5%. A 1% increase in the GDP<sub>i</sub> can increase the outward FDI by 1.24%. Likewise, A 1% increase in the GDP<sub>j</sub> (GDP of destination countries) can increase the outward FDI by 1.28%. As per the gravity model of international trade, the distance is negatively proportional to the dependent variable, OFDI, and is statistically significant. Its P-value is less than 0.05; “if there is a 1% increase in the Distance, the outward Foreign Direct Investment will decrease by -9.8%.” Meanwhile, the common ethnicity and Common colony are also statistically significant. If we see the employment (LNEMPi), a 1% increase in the employment of origin countries can result in a 4.90% increase in outward FDI. The p-value indicates that the variable Employment is statistically significant as the p-value is less than 5%; however, (LNEMP<sub>j</sub>), employment in destination countries can result in 5.75% increases in the OFDI if the employment increases by 1%.

The reason for the positive relation between FDI and Employment is that as the investment increases it will affect economic growth, which then will affect employment and economic welfare to increase through the increase of productivity and wage rate. Real effective exchange rate of India is also statistically significant where outflows or outward flow of FDI decreases by -2.68% is the Real effective exchange rate between India and GCC countries increases by 1%. The reason behind this is the mechanisms through which the exchange rate level affects FDI flows have been examined in several theoretical and empirical studies. The general conclusion of these studies is that devaluation in the recipient country's currency stimulates inflows of FDI, and conversely, an appreciation leads to a reduction. The study uses two dummy variables for our gravity model specification. The Common Colony (CC) shows a statistically positive relationship with Foreign Direct Investment. In the theoretical equation of the gravity model, the expected sign of a common colony is “positive”. The coefficient for the dummy variable is 1.98, which shows that it has a positive and important effect on Foreign Direct Investment. Another dummy variable, Common Ethnicity (CE), in our specification shows a statistically significant and negative relationship with Foreign Direct Investment. The dummy variable coefficient value is -2.63 which shows a negative impact on FDI. The Dummy Variables Common Colony and Common Ethnicity also show a positive and favorable effect on Foreign Direct Investment between India and GCC.

## 6- CONCLUSION

India continues to emerge as an attractive investment destination. Strategic collaborations, particularly in sectors such as infrastructure, energy, and technology, have likely propelled FDI from GCC countries, fostering economic cooperation between India

and the GCC. The diversification of investments from primarily oil-based economies such as the UAE and Saudi Arabia to other sectors like technology, healthcare, and real estate signifies a broader scope of investment interests. Geopolitical relations and diplomatic ties between India and the GCC countries have also played a pivotal role in fostering FDI inflows, reflecting the growing economic partnerships. The research paper analyzed flows of FDI between India & GCC. For empirical testing, the gravity model of international trade was used with pooled OLS and FGLS to calibrate, heteroscedasticity, this regression is executed with some critical macroeconomic variables in the paper and OFDI as an explained variable. After the result we get from the FGLS regression we conclude that FDI is a crucial driver of growth and development in the India and GCC countries, the flow of investment between India and GCC countries have is increasing because of the bilateral relation and investment strategies increasing among the both regions and it will lead to more growth and progress between India and GCC countries.

## Statements and Declarations:

The authors of the paper need to specify that we have no competing interest, no conflict of interest that might have influenced the work presented in this paper. The work is conducted by both the authors by their own, Authors didn't receive any funding to conduct this research work.

## REFERENCES

- Al-matari, E. M., MGAMMAL, M. H., Senan, N. A. M., & ALHEBRI, A. A. (2021). Determinants of foreign direct investment in GCC countries: An empirical analysis. *The Journal of Asian Finance, Economics and Business*, 8(4), 69–81.
- Donghui, Z., Yasin, G., Zaman, S., & Imran, M. (2018). Trade openness and FDI inflows: A comparative study of Asian countries. *European Online Journal of Natural and Social Sciences*, 7(2), pp-386.
- Dorakh, A. (2020). A gravity model analysis of FDI across EU member states. *Journal of Economic Integration*, 35(3), 426–456.
- Dua, P., & Garg, R. (2015). Macroeconomic determinants of foreign direct investment: Evidence from India. *The Journal of Developing Areas*, 133–155.
- Frenkel, M., Funke, K., & Stadtmann, G. (2004). A panel analysis of bilateral FDI flows to emerging economies. *Economic Systems*, 28(3), 281–300.
- Goyal, A. K. (2017). Effects of FDI Inflows in India: Growth Perspective. *FOCUS: Journal of International Business*, 4(2), 88–100.
- Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *The Stata Journal*, 7(3), 281–312.
- Javed, R., & Javed, F. (2017). A Panel Data Analysis of Foreign Direct Investment Inflows into India

- Since 1991 to 2015. *The Indian Economic Journal*, 65(1-4), 27-36.
- Kahouli, B., & Maktouf, S. (2015). The determinants of FDI and the impact of the economic crisis on the implementation of RTAs: A static and dynamic gravity model. *International Business Review*, 24(3), 518-529.
  - Kaur, S., Kumar, P., & Ansari, M. A. (2024). An analysis of Indian FDI inflows through an augmented gravity model: Exploring new insights. *International Economics and Economic Policy*, 1-21.
  - Khandare, V. (2016). Employment generation in India: Role of GDP and FDI. *International Journal of Humanities and Social Science Research*, 2(4), 36-40.
  - Mariev, O., Drapkin, I., & Chukavina, K. (2016). Is Russia successful in attracting foreign direct investment? Evidence based on gravity model estimation. *Review of Economic Perspectives*, 16(3), 245-267.
  - Martínez-Zarzoso, I. (2013). The log of gravity revisited. *Applied Economics*, 45(3), 311-327.
  - Mishra, B. R., & Jena, P. K. (2019). Bilateral FDI flows in four major Asian economies: A gravity model analysis. *Journal of Economic Studies*, 46(1), 71-89.
  - Mishra, R., & Palit, S. (2020). Role of FDI on employment scenario in India. *International Journal of Recent Technology and Engineering*, 8(6), 1481-1489.
  - Nadig, A., & Viswanathan, T. (2023). Foreign direct investment and macroeconomic factors: Evidence from Indian economy. *International Journal of Public Sector Performance Management*, 11(1), 62-80.
  - Sidhu, H., & Dhingra, N. (2009). Foreign direct investment inflows to India: Growth and forecasts. *Foreign Trade Review*, 44(3), 24-56.
  - Singh, S. (2019). Foreign Direct Investment (FDI) Inflows in India. *Journal of General Management Research*, 6(1).