



Using VAR Model of Indian Economic Factors Impact on Foreign Direct Investment – An Event Study.

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ABSTRACT

Purpose: Conducting an empirical study at the present phase of economic advancement suggests that foreign direct investment (FDI) significantly influences the sustained, high-caliber, and robust economic development of the host country. Every country engaged in the economic globalization trajectory is thus striving to foster a competitive business atmospherei domestically, aiming to attract additional foreign investments.

Design/Methodology/Approach: The primary focus of this research centers around Institutional quality or Evidence, with a particular emphasis on 7 selected Indian Economic factors namely Indian Gross Domestic Product, Indian Exports, Foreign Reserves, Gross National Product, Human & National resources, Capital formation & social factors, Technology development, from DPIIT website (Secondary Data) for the period 2022-2023. We are Using stalactitical tools like Unit root Test, ARDL Approach & VAR Model.

Originality/Value: This research uses the VAR Model or technique to examine how institutional variables affect FDI flows. Foreign direct investment (FDI) flows are the dependent variable in this study, and the influence of Economic variables on these flows is evaluated using the ordinary least square approach.

Findings: The study found from Johansen Joining test that co-mix condition exist between the FDI and GDP and stated that FDI coefficient is 0.1646, which indicates positively influenced on GDP. According to the research, foreign direct investment (FDI) is significantly impacting India's GDP development. The aftereffects of the vector auto relapse show that unfamiliar direct investment (FDI) movement is anticipated to lead to an increase in GDP in the near future.. Exports with GDP had co-integrated between each other and examined that export is positively influenced on GDP. The study observed from that FDI had significant growth effect on Indian exports and stated from VAR model that GDP is expected to up in near future based on FDI movement. The study found from Johansen Integration test that co-integration equation exist between the FDI and Foreign Reserve and stated that FDI coefficient is 0.1646 which indicates negatively influenced on Foreign reserve.

Keywords: FDI, Indian Economic Metrics, Economy Growth, VAR Model.

1. INTRODUCTION:

Through FDI, or foreign direct investment, one country may reap the benefits of their investment while another country boosts its production and rises in the social and economic ladder. For an investment to be considered efficient and effective, it must be seen as having a favourable impact on the economy over the long run. Its potential monetary effect may be little if its primary motivation is to generate profits in the near run. Federal direct

investment (FDI) could have a greater or lesser impact on GDP, the IT industry, and the economy as a whole depending on government trade barriers and foreign investment regulations. Seeking actual evidence to support this notion, this research conducts an empirical examination of India using time series information. An example of international investment is foreign direct investment (FDI), which happens when an individual or bunch from one nation has a drawn out stake in and huge impact over an organization in another economy. The current phase of economic development underscores the substantial impact of FDI on the stable, high-quality, and robust economic growth of the destination country. Nations participating in the global economic process are actively working to cultivate a competitive business environment to attract increased foreign investments.

Therefore, it becomes crucial to scrutinize the core determinants that exert the most significant influence on FDI inflows and their stability. Numerous studies on international capital flows reveal that the primary motivations behind making direct foreign investments historically revolve around ownership advantage, location benefits, and internationalization advantages. While factors like a strategically advantageous position, a large consumer base, and an abundance of raw materials contribute to a country's investment attractiveness, these alone are insufficient in today's highly competitive landscape for global capital.

In this fierce competition for FDI, attention must also be directed towards the regulatory framework within a nation. A well-structured regulatory environment not only reduces transaction costs for shareholders but also facilitates trade, providing essential safeguards and protections for foreign investors. Furthermore, it is critical to recognize that a combination of attractiveness to foreign direct investment (FDI) and good institutional efficiency is an important component in attracting FDI and reaping its benefits.

- ❖ Indian Gross Domestic Product
- ❖ Indian Exports
- ❖ Foreign Reserves
- ❖ Gross National Product
- ❖ Human & National resources
- ❖ Capital formation & social factors
- ❖ Technology development

2. REVIEW OF LITERATURE:

❖ **Mazumdar (2020):** - The research looked at how capital flows affected India's GDP growth and suggested that the early 1990s partial capital account liberalization had boosted hopes for a beneficial effect on India's GDP growth. This article examines the impact of foreign direct investment (FDI) entering India and considers the question of whether or not FDI has added to in general financial development.

❖ **Mahajan and Agarwal (2020):** Proposes indicate that India has the potential to draw foreign investment through effective marketing strategies. To enhance transparency and simplify the foreign investment policy, the Government has eliminated pre-equity approvals, provided specific preconditions are fulfilled. When coupled with factors like robust financial development in both home and host nations, improved corporate benefit, and raised stock valuations, these measures are anticipated to contribute to a resurgence in Foreign Direct Investment (FDI) flows.

❖ **Click (2019):** The study investigated the risk associated with US foreign direct investment spanning from 1982 to 1998 across 59 host countries. An empirical model was first built as part of the investigation to shed light on the patterns in return on assets (ROA), a measure of capital return, both across time and between countries. Four primary findings emerged from the study. Firstly, the ROA in a significant number of countries does not merely mirror global trends. Secondly, variations across countries are elucidated by financial risk. Thirdly, there exists a qualitatively distinct unexplained country risk.

❖ **Bhaumik (2019):** - The examination of the banking sector in the study contends that the expense productivity and benefit of public area banks have undergone substantial improvement. The article suggests that it is now opportune to take decisive action and privatize public sector banks. At the same time, the paper suggests encouraging more credit securitization as a means of reducing the dangers connected with the formation of bank assets.

❖ **Nagesh Kumar (20018):** The article titled "Liberalisation of FDI Flows and Development—Indian Experience in the 1990s" delves into the specifics of FDI that reached India beginning in 1991 and how it affected the country's economy. It gives an extensive outline of the evaluation of the Indian Government's strategy concerning FDI spanning from 1948 to 2004. Additionally, the paper delves into the scrutiny of patterns and examples portraying FDI inflows in India during the 1990s. Note that the author uses only secondary sources, such as the official publications of the Indian government and the unfamiliar speculation information base kept up with by the United Nations Conference on Trade and Development (UNCTAD).

❖ **Peng Hu (2017):** - The effect of the financial emergency on firms' operational behavior in East Asia is explored in the study titled "Economic Crisis on the Operational Behaviour of Firms: Case of East Asia." Based on their industrial and financial strength, several Finnish enterprises saw the Asian crisis as a chance to expand their operations or enter new markets in the area. Transnational corporations (TNCs) may be eligible for further investment incentives while the economy is in recovery. Despite the difficulties brought on by the Asian crisis,

the majority of the world's biggest companies showed remarkable tenacity and consistency in their strategy by continuing to have faith in the East Asian crisis nations as potential investment destinations.

❖ **Elissa Braum (2017):** - The report provides a thorough synopsis of the literature and government policy pertaining to the links between FII and development. It argues that growth occurs before Foreign Direct Investment (FDI), rather than the other way around, and provides substantial and consistent data in support of this claim. Moreover, the study emphasizes the critical role of the economic policy context in realizing developmental advantages from FDI. In addition to maintaining low creation expenses to draw in excellent FDI, countries should likewise have adequate homegrown abilities to effectively leverage the benefits derived from foreign direct investment.

❖ **Subramanya and Bhuma (2016):** - According to the research article "Studying Outward FDI by India," there is a significant relationship between remittances and the elasticity of government spending and labour outflows. Based on the data, the amount of investments made abroad is intently attached to the solace level of the financial backers. According to the report, remittances are affected by the amount of individuals joining the workforce, which is in turn affected by government expenditure on higher education and increasing the supply of qualified workers.

❖ **Rajesh Narula and S. Lai (2016):** - According to the articles included in the edited collection, one of the most important goals is to learn how to maximize the advantages that the host nation gets from FDI. The essays in this collection draw attention to a fundamental inconsistency: "With frail neighborhood capacities, industrialization turns out to be more dependent on FDI." This paradox is present despite the diverse range of nations and methodology used. Importantly, the studies presented in this volume do not lend support to the notion that FDI is an absolute prerequisite for economic development.

❖ **Karunakaran (2015):** - The research delved into a historical examination of foreign banks, scrutinizing their operations through the lens of historical perspectives. Drawing insights from this historical overview, the study proceeded to conduct an analysis of contemporary policies that have facilitated and encouraged the aggressive expansion of foreign banks.

❖ **Vasudevan (2015):** - The paper delineates the absence of a standardized theoretical framework concerning portfolio flows. Foreign direct investment (FDI) was the central idea in the early writings on the subject of foreign investment; this viewpoint became politically significant in the 1924 Soviet Union's Leninist New Economic Policy, as economic historians remember.

4. STATEMENT OF PROBLEM:

Foreign Direct Investment (FDI) has poured into developing countries at a rapid pace in the last few years. Attracting foreign direct investments (FDIs) seems to depend heavily on the level of economic and social growth in these developing nations, particularly in relation to future industries, institutional environments, and policy shifts. The use of measures including incentives, concessions, regulatory liberalisation, and investment assurances has been implemented. Yet, when it comes to luring a significant quantity of FDI, India falls short. Despite China's doubling of foreign direct investment (FDI) throughout the past ten years, India's all out FDI inflows show serious areas of strength for a pattern. The country has not attracted the foreign direct investment (FDI) anticipated, particularly in comparison to other large, economically oriented nations among the world's fastest-growing nations (BRICS), despite its dynamism, tremendous potential, and rising relevance for FDI.

5 RESEARCH GAP:

Only a limited number of studies have undertaken an examination concerning the strategy influence on Foreign Direct Investment (FDI) flows. A few of these studies have focused on investment decisions, technological aspects, and economic challenges associated with financial mobilization through FDI. The government of India has recently examined the latest developments in attracting FDI flows, with most studies addressing regulatory bottlenecks in the field of unfamiliar direct speculation. In spite of a huge number of global, national, and local studies utilizing reasonably large samples, these efforts have not fully addressed the complexities and challenges related to the growth of FDI flows. It is noteworthy that smaller countries have demonstrated a more successful ability to draw in a bigger part of FDI than India. For instance, Belgium has achieved a 100% success rate in attracting FDI and is recognized as the highest FDI-attracting country globally. One major impediment identified is the institutional factors that appear to be unable to effectively channel funds into India.

6. OBJECTIVES OF THE STUDY:

- ❖ To study the Role of Foreign Direct investment flows in to India.
- ❖ To study the Foreign Direct investment (FDI) impact on Indian economic growth.

7. HYPOTHESES OF THE STUDY:

Ho: There is no impact of dimensions of Economic metrics on FDI flows.

H1: There is an impact of dimensions of Economic metrics on FDI flows.

8. RESEARCH METHODOLOGY:

Study period:

The period of the study is between the financial year 2022-23. And the data collected from DPIIT website and Few journals.

Statistical tools to be used:

- Unit Root Test
- ARDL approach
- VAR Model
- MIDAS Model

9. SCOPE OF THE STUDY:

In order to analyse the ten institutional variables that contribute to India's economic development, we will first examine the effect of unfamiliar direct speculation streams on the development of certain sectors in the nation.

10. RESULT AND DISCUSSION:

❖ To study the Role of Foreign Direct investment inflows in India.

Table No:1 Share of Top Five Investing Countries in FDI Equity Inflow in April 2022 to March 2023.

Rank	Country	FDI Equity Flow During 2022-2023.	% Share in FDI Equity Flow During 2022-2023.
1	Singapore	1,37,374	37 %
2	Mauritius	48,895	13 %
3	USA	48,666	13 %
4	UAE	26,315	7%
5	Netherland	19,855	5%

Table No:2 Share of Top Five Investing Sectors in FDI Equity Inflow in April 2022 to March 2023.

Rank	Country	FDI Equity Flow During 2022-2023.	% Share in FDI Equity Flow During 2022-2023.
1	Computer Software & Hardware	74,718	20 %
2	Service Sector	69,852	19 %
3	Trading Sector	38,060	10 %
4	Non-Conventional Energy	19,977	5%
5	Drugs & Pharmaceuticals	16,654	4%

Challenges Facing International Investment:

Foreign investment in a host country can have various impacts, and foreign investors often conduct research to identify obstacles that may negatively affect their investments. Companies are naturally averse to incurring losses, and understanding the challenges in the host country is crucial for making informed investment decisions (Boopath, D., 2013). Several reasons may dissuade foreign companies from investing in a particular host country, ranging from regulatory hurdles and economic instability to political uncertainty and inadequate infrastructure. Identifying and addressing these challenges is essential for fostering a conducive environment that attracts and retains foreign investment.

❖ **Rate of Interest/Foreign Exchange Rate:** Differences in interest rates between countries play a crucial role in foreign capital movements. Capital tends to flow from low-interest-rate countries to those with higher rates. The movement of foreign investment is particularly slow in the presence of an unstable exchange rate and the anticipation of a future decline.

❖ **Speculation:** Short-term capital movements can be influenced by speculation about expected changes in interest rates. Investment portfolios in the host country market are subject to speculation, and if the market is perceived as strong in speculation, foreign investors may reduce their investments, leading to a smaller unfamiliar speculation development in the host country.

❖ **Profitability:** Foreign capital flows in the private sector are heavily influenced by the desire of profit. In light of this, private investment flows to nations with relatively better rates of return.

❖ **Costs of Production:** Lower creation costs in outside nations act as an incentive for private capital movements. This can be categorized into two types of cost-saving investments – the first involves acquiring raw materials from abroad that are essential for manufacturing and selling finished products, while the second pertains to reducing the costs of production, particularly labor, through substantial interests in extractive enterprises.

❖ **Economic Conditions:** Opportunities for confidential unfamiliar venture are exceptionally impacted by financial factors, such as the size of the population and the country's income level, which in turn affect market potential and infrastructural facilities.

❖ **Government Policies:** Investments from other countries may be influenced by a country's policies, particularly those that deal with collaboration, revenue, taxes, currency rates, tariffs, monetary incentives, and foreign investment.

❖ **Political Factors:** Political factors, including political stability, party organisation, and diplomatic connections with foreign nations, are also influential in shifting capital flows. Political influences on business practices, including changes in tax policies and industrial regulations, can either positively or adversely affect the flow of unfamiliar interest in a country.

The objective is to research how FDI affects the development of certain industries in India.

H₀: Economic Growth Factors of FDI are not stationary

H₁: Economic Growth Factors of FDI are stationary

Table No:3 An augmented Dickey-Fuller unit root test

Economic Growth Indicators	Level	1 st Difference	2 nd Difference
Indian Gross Domestic Product	0.0033*		
Indian Exports	0.08692	0.0000*	
Foreign Reserves	0.0000*		
Gross National Product	0.00692		
Human & National resources	0.09692	0.01292	0.0000*
Capital formation & social factors	0.07692	0.0000	
Technology development	0.00092	0.0000	

Interpretation:

Table 1 shows that the sectoral investment components of foreign direct investment (FDI) were found to be significantly different at the 5% level when tested using the Augmented Dickey Fuller test. At the 5% level of significance for the first difference Indian Gross Domestic Product, Foreign Reserves, Gross National Product and Indian Export, Capital formation & social factors, Capital formation & social factors in 1st difference and finally Human & National resources is 2nd difference.

Table No:4 Investment and GDP Estimates using Vector Auto Regression

Vector Auto regression Estimates		
Sample (adjusted): 2022- 2023		
Included observations: 12 after adjustments		
Standard errors in ()& t-statistics in []		
	GDP	FDI
GDP (-1)	0.235641 (1.4564) [0.11238]	0.028841 (0.01553) [0.74587]
GDP (-2)	0.52456 (1.32152) [0.356212]	0.036522 (0.01566) [-0.574652]
FDI (-1)	0.164655 (7.44621) [-0.63672]	0.235842 (0.37644) [0.75768]
FDI (-2)	0.470517 (0.48322) [-0.15452]	-0.435456 (0.36584) [-1.75121]
C	1.040312 (6.70111) [1.54432]	7.671510 (2.35110) [3.66232]
R-squared	0.470552	0.438466
Adj. R-squared	0.321214	0.144896
Sum sq. resids	8.657865	1.026665
S.E. equation	3.524897	1.204567
F-statistic	2.323129	1.481742
Log likelihood	-234.8436	-394.4568
Akaike AIC	56.15662	49.48665
Schwarz SC	56.48565	49.78446
Mean dependent	1.624561	7.214564
S.D. dependent	4.284884	1.314545
Determinant resid covariance (dof adj.)		1.764699
Determinant resid covariance		6.007895
Log likelihood		-625.0456
Akaike information criterion		125.78569
Schwarz criterion		116.2446
Number of coefficients		10

Source: E-views version 12 data combined with secondary sources

Interpretation:

Two endogenous factors, FDI and Gross domestic product, with two slacks each, are displayed in the table. In the VAR, each equation is represented by a column, and each row contains the corresponding regressors. Their respective T-values are 0.11238 and 0.74587, and when we combine the regressors by variable, we find that a one-unit rise in GDP is 0.235641, leading to a 15.6% increase, and that foreign direct investment (FDI) climbs to 2.2%. Their respective T-values are 0.356212 and -0.574652, which indicate that FDI is -0.036522 decreasing to 2.6% and GDP is 0.52456 increasing to 55.4%. With a rise in FDI to 1 unit, or 0.235842, GDP will fall to -0.164655, or 14.7%. Their respective T-values are 0.75768 and -0.63672. Foreign direct investment (FDI) rises by -0.435456 units, resulting in a drop of 43.5% and a drop in GDP to 47%. A T-value of -1.75121 and -0.15452 matches them.

H₀: There is no Co-integration between FDI and GDP regarding Indian Economic Growth

H₁: There is a Co-integration between FDI and GDP regarding Indian Economic Growth

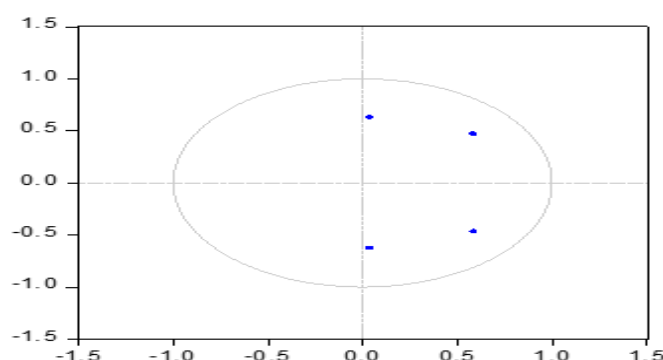
Table No:5 Johansen Integration Test for FDI and GDP

Sample: 2004 2018					
Included observations: 12					
Series: GDP FDI					
Lags interval: 1 to 1					
Selected (0.05 level*) Number of Co-integrating Relations by Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	2	1	1	1
Max-Eig	2	2	1	1	2
*Critical values based on MacKinnon-Haug-Michelis (1999)					
Information Criteria by Rank and Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Rank or	No Intercept	Intercept	Intercept	Intercept	Intercept
No. of CEs	No Trend	No Trend	No Trend	Trend	Trend
Log Likelihood by Rank (rows) and Model (columns)					
0	-656.8033	-656.8033	-656.3349	-656.3349	-622.2853
1	-622.1647	-636.9757	-636.5615	-636.2033	-636.2895
2	-622.0524	-628.0543	-628.0543	-646.8449	-646.8449
Akaike Information Criteria by Rank (rows) and Model (columns)					
0	106.4672	106.4672	106.7225	106.7225	106.7142
1	106.6941	105.9960*	106.0936	106.2006	106.0483
2	107.3421	106.5091	106.5091	106.6408	106.6408
Schwarz Criteria by Rank (rows) and Model (columns)					
0	106.4562	106.4569	106.9649	106.9844	107.0375
1	107.0156	106.4516*	106.4977	106.6450	106.5332
2	107.9285	107.0456	107.4565	107.2874	107.2874

Source: Based on secondary data collected using E-views version 12.

Interpretation:

The Johansen trial of co-incorporation table shows the Follow and Max-Eigen values used to find the order of integration. When the p-value is less than 0.05 ($0.0000 < 0.05$), it means that none of the variables are co-integrated. However, when looking at the table results, it becomes clear that there is something like one co-incorporating condition or mistake. This implies that the p-esteem is more noteworthy than 0.05 for both the follow and Max-Eigen values, dismissing the invalid speculation and tolerating the elective speculation, or at least, that the variables are co-integrating.

Figure: 1 A Reverse Root Analysis of AR Features The polynomial of foreign direct investment and gross domestic product**Interpretation:**

The known AR polynomial's inverse roots are shown in the following graphs. Since all of the roots are within the unit circle and have a modulus smaller than one, the predicted VAR is stable, as seen in Figure. Therefore, the data follows a normal distribution.

Table No:6 Foreign Direct Investment and Export Models using Vector Auto Regression

Vector Auto regression Estimates		
Sample (adjusted): 2022 - 2023		
Included observations: 12 after adjustments		
Standard errors in () & t-statistics in []		
	EXPORTS	FDI
EXPORTS (-1)	0.9146565 (1.71251) [0.54562]	-0.011732 (0.00199) [-0.85789]
EXPORTS (-2)	-0.365656 (1.67705) [-0.20187]	0.047950 (0.00195) [0.95762]
FDI (-1)	-58.64564 (232.957) [-0.394565]	0.342907 (0.27056) [1.26456]
FDI (-2)	-24.92719 (189.996) [-141501]	-0.486656 (0.22066) [-2.46465]
C	1.330113 (1.71313) [0.76346]	8.403510 (2.01410) [4.15656]
R-squared	0.664531	0.684915
Adj. R-squared	-0.154452	0.189156
Sum sq. resids	7.184595	8.694620
S.E. equation	1.013613	1.184610
F-statistic	0.445124	1.487795
Loglikelihood	-373.1497	-292.0522
Akaike AIC	53.07793	49.44499
Schwarz SC	53.21326	49.81546
Mean dependent	1.852513	7.214610
S.D. dependent	9.421012	1.311610
Determinant resid covariance (dof adj.)		1.324846
Determinant resid covariance		4.497945
Log likelihood		-546.7641
Akaike information criterion		132.3602
Schwarz criterion		132.4852
Number of coefficients		10

Source: Compiled from E-views version 12 on secondary data

Interpretation:

The table shows that FDI and exports are two endogenous variables with two lags each. In the VAR, each equation is represented by a column, and each row contains the corresponding regressors. Grouping the regressors by variable yields the following results: a 91% rise in exports and a 1% drop in foreign direct investment (FDI); a 33% fall in exports and a 0.1% increase in FDI; a T-value of 0.54562 and a -0.85789 for the regressors, respectively. If foreign direct investment (FDI) rises to 1 unit, or 0.342907, it will grow by 34%, but exports fall to -58.6456, or 68%. 1.264565 and -0.3945655 are their T-values. There is a 52% drop in FDI and a 24.9% drop in exports as a result of a -0.486656 rise with 2 units. The T-values for them are -2.46465 and -0.14150, respectively.

H₀: There is no Co-integration between FDI and Exports regarding Indian Economic Growth

H₁: There is a Co-integration between FDI and Exports regarding Indian Economic Growth

Table No:7 Johansen Integration Test for FDI and Exports

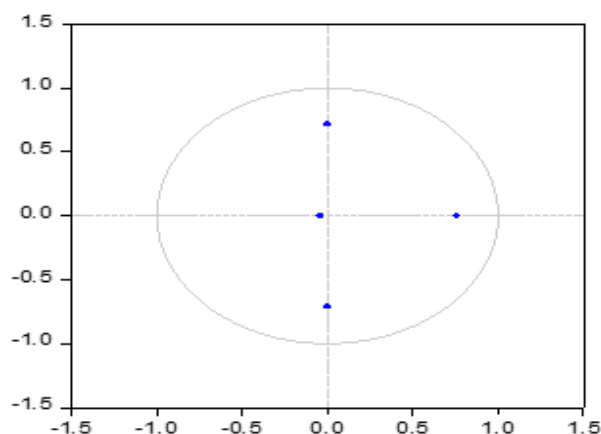
Sample: 2022 - 2023					
Included observations: 12					
Series: EXPORTS FDI					
Lags interval: 1 to 1					
Selected (0.05 level*) Number of Co-integrating Relations by Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	1	1	2	1
Max-Eig	1	1	1	2	2
*Critical values based on MacKinnon-Haug-Michelis (1999)					
Information Criteria by Rank and Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Rank or	No Intercept	Intercept	Intercept	Intercept	Intercept
No. of CEs	No Trend	No Trend	No Trend	Trend	Trend
Log Likelihood by Rank (rows) and Model (columns)					
0	-674.3800	-674.3800	-673.7526	-673.7526	-671.9522
1	-673.0867	-665.8596	-665.7330	-665.7076	-664.2125
2	-673.0867	-664.7641	-664.7641	-662.9442	-662.9442
Akaike Information Criteria by Rank (rows) and Model (columns)					
0	113.0633	113.0633	113.2921	113.2921	113.3254
1	113.5144	112.4766*	112.6222	112.7846	112.7021
2	114.1811	113.1273	113.1273	113.1574	113.1574
Schwarz Criteria by Rank (rows) and Model (columns)					
0	113.2250	113.2250	113.5345	113.5345	113.6486
1	113.8377	112.8403*	113.0263	113.2291	113.1870
2	114.6660	113.6931	113.6931	113.8039	113.8039

Source: Created using E-views 12 and secondary sources of information

Interpretation:

The Trace and Max-Eigen values, which are used to identify the request for joining in the Johansen trial of co-mix table, show that the factors are generally not co-coordinated, since the p-esteem is under 0.05 ($0.0000 < 0.05$). Thusly, the invalid speculation is dismissed.

In view of the outcomes displayed in the table, apparently there is just a single co-incorporating condition or blunder. This implies that the invalid speculation can't be acknowledged and that the elective theory, which states that the variables are co-integrating, is accepted. The p-values for the trace and Max-Eigen values are greater than 0.05.

Figure: 2 Roots of AR Features in the Other Direction Investment and Export Polynomial

Source: Using E-views version 12 and secondary sources, the author

Interpretation:

The known AR polynomial's inverse roots are shown in the following graphs. Since all of the roots are within the unit circle and have a modulus smaller than one, the predicted VAR is stable, as seen in Figure. Therefore, the data follows a normal distribution.

Table No:8 Estimates of Foreign Direct Investment and Foreign Reserve Using Vector Auto Regression

Vector Auto regression Estimates		
Sample (adjusted): 2022 2023		
Included observations: 12 after adjustments		
Standard errors in ()& t-statistics in []		
	FOREIGN RESERVES	FDI
FOREIGN_RESERVES (-1)	0.681455 (0.45694) [1.68054]	0.223421 (0.13542) [1.54154]
FOREIGN_RESERVES (-2)	0.071637 (0.36554) [0.34785]	-0.292046 (0.32145) [-1.46861]
FDI (-1)	0.347982 (0.75952) [-0.57842]	0.074189 (0.32164) [0.17345]
FDI (-2)	0.103285 (0.46585) [0.37540]	-0.437107 (0.35644) [-1.86965]
C	1.154611 (5.29710) [2.21212]	8.336710 (1.97910) [4.28739]
R-squared	0.81456	0.774535
Adj. R-squared	0.705455	0.542270
Sum sq. resids	5.724521	7.944920
S.E. equation	2.864910	1.077810
F-statistic	7.590809	2.384530
Log likelihood	-302.7052	-290.8625
Akaike AIC	51.28420	49.31042
Schwarz SC	51.48624	49.51246
Mean dependent	3.017911	7.216510
S.D. dependent	5.274610	1.319610
Determinant resid covariance (dof adj.)		4.271340
Determinant resid covariance		1.451540
Log likelihood		-588.9121
Akaike information criterion		99.81868
Schwarz criterion		100.2228
Number of coefficients		10

Source: Information derived from secondary sources and E-views version 12

Interpretation:

Foreign direct investment (FDI) and foreign reserve (FR) are two endogenous variables that have two lags, as shown in the table. The VAR equations are organised in columns, and the regressors are organised in rows, in the table. By dividing the regressors into groups according to the variables of interest, we find that a 65%

increase in foreign reserves and a 22% rise in foreign direct investment (FDI) result in T-values of 1.68054 and 1.54154, respectively. The T-values for the two factors are 0.34785 and - 1.46861, separately, and the foreign direct investment (FDI) rises by 0.292046 to 19% while the foreign reserve increase by 2 units is 0.071637, increasing the overall gain to 8.2%. 7.4 percent growth in FDI to 1 unit, or 0.074189, and a 34.1 percent decline in foreign exchange reserves, or -0.347982. The T-values for them are 0.17345 and -0.57842. Foreign direct investment (FDI) increased by 2 units is -0.437107, resulting in a 43.7% decline and a 10.3% drop in foreign reserve. Together, they make up a T-value of -1.86965 and 0.37540.

H0: There is no Co-integration between FDI and Foreign regarding Indian Economic Growth

H1: There is a Co-integration between FDI and Foreign regarding Indian Economic Growth

Table No:9 Export and Foreign Direct Investment Johansen Integration Test

Sample: 2022 2023					
Included observations: 12					
Series: FOREIGN RESERVES FDI					
Lags interval: 1 to 1					
Selected (0.05 level*) Number of Co-integrating Relations by Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	2	2	1	2
Max-Eig	1	2	2	1	2
*Critical values based on MacKinnon-Haug-Michelis (1999)					
Information Criteria by Rank and Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Rank or	No Intercept	Intercept	Intercept	Intercept	Intercept
No. of CEs	No Trend	No Trend	No Trend	Trend	Trend
Log Likelihood by Rank (rows) and Model (columns)					
0	-606.4549	-606.4549	-603.7749	-603.7749	-602.5772
1	-597.3736	-594.1099	-591.9131	-591.9010	-590.7949

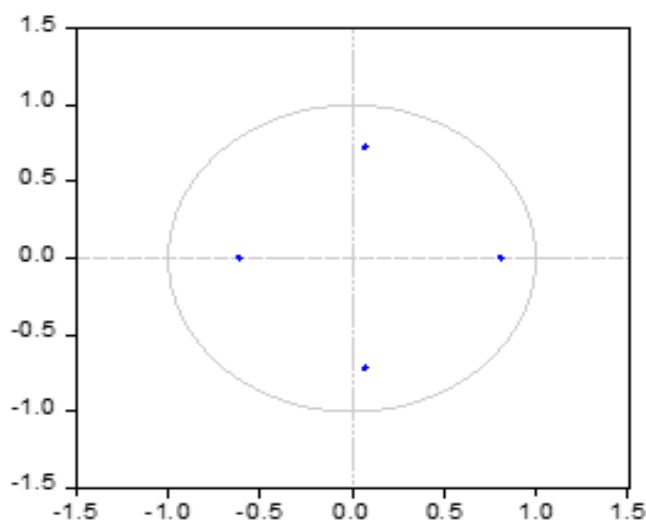
2	-597.0762	-588.9121	-588.9121	-585.9968	-585.9968
Akaike Information Criteria by Rank (rows) and Model (columns)					
0	101.7425	101.7425	101.6291	101.6291	101.7629
1	100.8956	100.5183	100.3189*	100.4835	100.4658
2	101.5127	100.4853	100.4853	100.3328	100.3328
Schwarz Criteria by Rank (rows) and Model (columns)					
0	101.9041	101.9041	101.8716	101.8716	102.0861
1	101.2189	100.8820	100.7229*	100.9280	100.9507
2	101.9976	101.0511	101.0511	100.9793	100.9793

Source: Created using E-views 12 and secondary sources of information

Interpretation:

The Trace and Max-Eigen values may be seen in the Johansen test of co-integration table, which helps to establish the order of integration. Results from the tests indicate that there is no co-integration of the variables, since the p-value is less than 0.05 (0.0000<0.05). With p-values larger than 0.05 for both the trace and Max-Eigen values, the findings demonstrate that there is a maximum of one co-integrating equation or mistake. This indicates that the variables are co-integrating, which is the alternative hypothesis, and rejects the null hypothesis.

Figure: 3 Roots of AR Features in the Other Direction Formula for Foreign Direct Investment and Reserves



Source: Created using E-views 12 and secondary sources of information

Interpretation:

The known AR polynomial's inverse roots are shown in the following graphs. Since all of the roots are within the unit circle and have a modulus smaller than one, the predicted VAR is stable, as seen in Figure. Therefore, the data follows a normal distribution.

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