ISSN: 2755-0214

Journal of Economics & Management Research

SCIENTIFIC Research and Community

Review Article

Open Access

The Impact of FDI Inflows on GDP Growth Rate and Unemployment Rate in India During 1991-2023

Debesh Bhowmik

Ex. Professor, Lincoln University College, Malaysia

ABSTRACT

The paper examined to relate the impact of FDI inflows in India on the unemployment rate and the economic growth as measured by GDP per capita during the study period from 1991 to 2023 using Johansen cointegration and vector error correction analysis. Moreover, the behaviour of India's FDI inflows was studied by applying nonlinear trend, Hamilton's decomposition model and tested ARIMA(p,d,q) model. The paper found that there is at least one cointegrating equation which tends to equilibrium insignificantly. The vector error correction showed that FDI inflows is positively related with GDP per capita and negatively related with unemployment rate. There is a short run relation between FDI and GDP per capita. There is no impulse response of FDI to unemployment rate and GDP per capita.

***Corresponding author**

Debesh Bhowmik, Ex. Professor, Lincoln University College, Malaysia.

Received: July 13, 2023; **Accepted:** July 21, 2023; **Published:** July 26, 2023

Keywords: FDI Inflows, GDP Growth, Unemployment Rate, Cointegration, Vector Error Correction

JEL codes- C33, D2, D24, E24, F21, F23, O4

Introduction

Generally, FDI inflows have positive influence on GDP growth rate but it depends on country to country and sector to sector and varies period from periods. The majority of the studies revealed that FDI inflows have had a positive influence on growth which were found from the studies from Yao, Yucel, Bhattarai and Bhowmik and so on [1-4].

It is not impossible that FDI has negative effects on economic growth by crowding out domestic investment, increasing external vulnerability, and causing dependence [5, 6]. According to "neutrality hypothesis", a causal relationship between FDI and economic growth may not exist. Herzer examined data for 44 developing countries during 1970 - 2005, and observed that on an average, the effect of FDI on economic growth in developing countries is negative under panel data [7].

A large number of studies revealed that FDI inflows affected unemployment negatively which were found from the studies from Gocer et al., Zeb et al. and Kurtovic et al, while relatively fewer studies have discovered a positive relationship through FDI inflows and unemployment e.g., Bayar and Mucuk and Demirsil etc [8-12]. Furthermore, a considerable number of studies also found no significant relationship between FDI inflows and unemployment such as Djambaska and Lozanoska [13]. In 21 emerging market economies during 1994-2014, the long run relationship is positive, in Central Asia and Soviet and Balcan states during 1990-2015, the FDI inflows and unemployment rate showed positive long run relation, in 8 Arab countries, the relation is inverse, in 6 EU countries, there is no causal relationship [14-17]. In Jordan during 1998-2015,the relation between FDI inflows and growth is positive but the relation between FDI inflows and unemployment is negative which is similar with 20 English and Dutch speaking Caribbean countries during 1990-2000 and in Indonesia during 1975-2005 and also in Malaysia from 1980 to 2010 [18-21].Even, Golding and Masih studied in South African countries applying ARDL approach and found that the relation between FDI inflows and unemployment rate is insignificantly negative [22].

The paper tried to focus on the relationship between FDI inflows, unemployment rate and GDP per capita of India from 1991 to 2023 applying cointegration and vector error correction analysis.

Some Important Researches

Shaari, Hussain and Halim examined the impact of foreign direct investment (FDI) on the unemployment rate and economic growth in Malaysia from 1980 to 2010 using the ordinary least squares method [21]. The study indicates that FDI helped to reduce the unemployment rate and increased the gross domestic product (GDP). A 1% increase in FDI caused a decrease of 0.009% in unemployment and an increase of 1.219% in GDP.

Zeb, Qiang and Sharif explored the impact of Foreign Direct Investment (FDI) on Unemployment in Pakistan from 1995 to 2011 applying Multiple regression which revealed that Foreign Direct Investment plays a significant role in unemployment reduction in Pakistan [9].

Zdravković, DJukić and Bradić-Martinović examined the relationship between FDI inflows per capita and unemployment rates in 17 transitioning countries over the period 2000-2014

through OLS panel estimations which indicate that FDI and unemployment are most likely not co-integrated [23].

Simionescu and Simionescu examined the relationship between FDI and unemployment rate in the US for the period from 2000 to 2016 applying Vector error correction model and showed that only in the long-term the changes in the US unemployment rate influenced the FDI [24]. There exists no short-run relationship between FDI and variation in unemployment rate.

Yilmaz and Mahmut Unsal investigated the long run effect of both foreign direct investments and domestic investments on the unemployment in 21 emerging economies over the period 1994-2014 using a panel data analysis which revealed a co-integrating relationship among domestic investments, foreign direct investments, and unemployment [25]. Furthermore, foreign direct investment inflows affected the unemployment positively in the long term. However, FDI inflows affected the unemployment negatively in Colombia, Mexico and Russia, while FDI inflows affected the unemployment positively in Brazil, China, Czech Republic, India, Korea, Poland, Thailand and Turkey. Moreover, FDI inflows had no significant effects on unemployment in Chile, Egypt, Greece, Hungary, Indonesia, Malaysia, Peru, Qatar and South Africa.

Johnny, Timipere and Krokeme tested an Empirical Analysis of the Relationship between Foreign Direct Investment and Unemployment Rate in Nigeria from 1980 to 2015 through the unit root test, co-integration test, and ordinary least square and found that there is an insignificant negative relationship between Foreign Direct Investment and unemployment rate in Nigeria [26].

Bhowmik examined that FDI inflows in India has causal relation uni-directionally with fiscal deficit, and bi-directionally with inflation, exchange rate, interest rate and growth rate during 1971-2015 and found three cointegrating equations [27].

Karimov, Parádi-Dolgos and Koroseczné Pavlin examined that Foreign Direct Investment inflows have a crucial impact on decreasing the unemployment rate in Turkey during 1980-2017 where Granger causality test had showed that there is unidirectional causality from FDI to unemployment rate [28].

Alalawneh and Nessa examined in six countries in the Middle East and North Africa, Egypt, Jordan, Lebanon, Morocco, Tunisia, and Turkey from 1990 to 2018 using Fixed Effect Model (FEM) and Random Effect Model (REM) and found that FDI reduces the unemployment rate, the male unemployment rate, and the female unemployment rate in the long run [29]. There is no causal relationship in the short term between FDI and unemployment in its various forms, while there is a bidirectional causal relationship between FDI and exports according to the three economic models.

Al-Masbhi and Du studied Yemen from 1998 to 2018 applying cointegration test and found the existence of a long-run relationship between FDI, GDP growth and unemployment [30]. The Granger causality test suggests that causality runs from FDI to Unemployment, not GDP.

Liang, Shah, and Bifei found a positive relationship between FDI and economic growth in developing country and the relation between FDI and unemployment is found negative [31]. The overall results show that FDI and economic growth has a positive relationship in developing countries.

Kadiša,Butkus and Aleksandravičienė studied the effect of foreign direct investment on the growth-unemployment nexus using EU-28 panel data and interactive model with pooled OLS estimator analysing Okun's law and found that FDI weakens the effect of growth on unemployment [32]. Moreover, with an increase in FDI, the effect of growth on unemployment becomes less statistically significant.

In analysing Okuns law, Fuhrmann stated that unemployment should fall by one percentage point as GDP increases by 2-3% which was similar to Umair and Ullah and explained that growing output should not be harmful to unemployment, but there is an inflation risk which can affect negatively on unemployment. An,Ghazi and Prietto found that Okun's law works in the developed countries well. Pizzo studied in the Latin American countries which reveal that there are different Okun's coefficients as compared to the USA where Okun's coefficient can be different for European countries which was supported by An, Ball, Jalles and Loungani who stated that Okun's law is a great tool for finding coefficients of growth-unemployment relationship including forecasting [33-37].

Said, Al Baqy, Mohammed, Okasha and Shaaban examined the relation between FDI and unemployment in Egypt from 1990 to 2019 and explored that there is a positive significant relation between FDI and unemployment in Egypt [38].

Woldetensaye, Sirah and Shiferaw examined nexus between foreign direct investments and unemployment in East Africa using panel data during 1996–2021and concluded that annual unemployment rate, annual population growth rate, and economic growth of the host countries have significant impacts on foreign direct investments in which foreign direct investment has a significant negative impact on unemployment [39].

Nguyen investigated the relationship between GDP growth rate, inflow foreign direct investment (FDI), trade openness, and unemployment in five South Asian countries between 1998 and 2017 using a vector autoregressive model and found that GDP growth rate and unemployment have positive relationships with FDI [40]. There is a long-run relationship between GDP growth rate, FDI, trade openness's and unemployment in the region. Stepanok found that lower FDI costs increase unemployment both in the North and in the South causing a direct positive one which contributes to the turnover of firms parallel to innovation and the indirect effect appears through innovation and growth: more FDI means higher innovation which intensifies firm turnover and increases the unemployment rates. Besides, the effect of FDI on welfare is a positive relation [41].

Objective of the paper

The paper endeavours to study the nature of impact of foreign direct investment inflows on the GDP growth rate as well as on the unemployment rate during 1991-2023 in India through the econometric model of cointegration and vector error correction analysis.

Methodology and Data

The non-linear trend was fitted by the semi-log regression model.

The estimated equation can be written as: $\log(x_i)=a+bt+ct^2+dt^3+et^4+ft^5+ui$ where x_i=variable to be estimated, a, b, c, d, e and f are constants, t=time(year), u_i=random error, for all values of i=1,2,3,……n.

Box and Jenkins (1976)[44] methodology of ARIMA (p, d, q) can be estimated as below.

$x_t = a + b_i x_{t-i} + \varepsilon_t + b_{oi\varepsilon t-i} + \grave{e}_t$ where x_t is the variable, a is constant, b_i are the coefficients of AR process and b_{oi} are the co-efficients of MA process and $\grave{e}_t$ is residual and i=1,2,…….n, and t= time. If b_i and b_{oi} are less than zero and significant at 5% level then the model is convergent and significant. If the roots of AR and MA are less than one then the model is stable and stationary.

Hamilton regression filter for decomposition was applied to get cycles, cyclical trend and seasonal variation utilising the STL method which was developed by Cleveland, Cleveland, McRae and Terpenning [42, 43].

The Data on FDI inflows in billion US Dollars in current price, GDP per capita in US Dollar in current price and unemployment rate as percent of total workforce for india were collected from the World Bank from 1991 to 2023.

Observations and Results

Trends and Patterns of FDI Inflows

Foreign Direct Investment inflows in India has been catapulting linearly at the rate of 16.98% per year significantly during 1991-2023 which is observed from the estimated trend line given below.

$Log(x) = -0.5876 + 0.16989t + u_i$

(-2.43)* (13.73)*

Where R^2=0.85, F=188.78*, DW=0.360,*=significant at 5% level, x=FDI inlows in billion US dollars, u_i= random error, n=33,t= year.

The path or trend line of foreign direct investment inflows in India is actually non-linear form which is estimated below.

$Log(x) = -2.235 + 0.5246t - 0.0169t^2 + 0.000215t^3 + u_i$

(-6.42)* (6.00)*(-2.85)* (1.87)

Where R^2=0.94, F=160.21*, DW=0.707,*=significant at 5% level., n=33, u_i= random error,

The estimated trendline is depicted in Figure 1 where it is nearly concave.

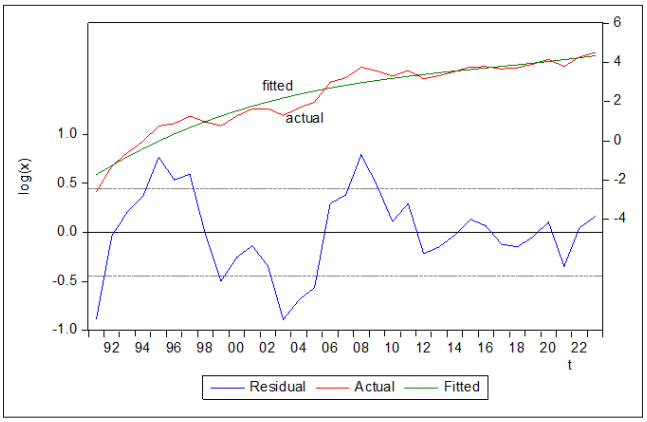

Figure 1: Fitted nonlinear trend of FDI

This nonlinear trend line model of FDI inflows in India is a stable model since its CUSUM of square of the residual stability test passes through ±5% significant level which is shown below in Figure 2.

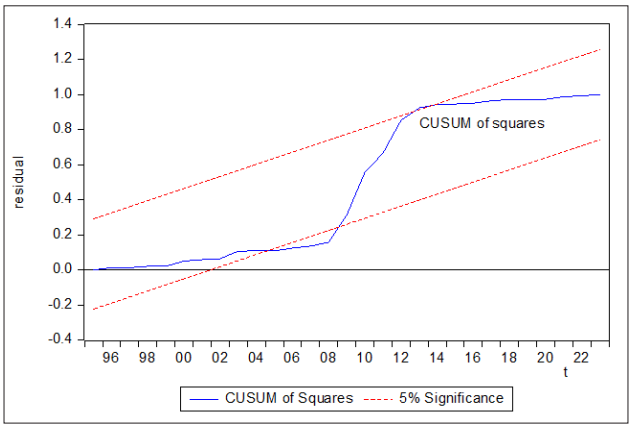

Figure 2: Stability Test

FDI inflows in India during 1991-2023 has no unit root since null hypothesis Ho=log(x) has a unit root which has been rejected at 5% level because ADF=-6.0055 which has the probability of less than 0.01. But the ADF t statistic has a break point in 2005 which was examined through SIC with maximum lag 8 which is depicted in Figure 3.

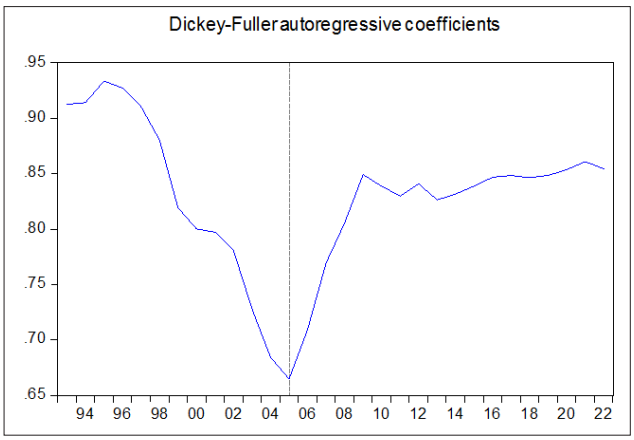

Figure 3: Break unit root at 2005

The estimated regression of Hamilton (2018) decomposition analysis of FDI inflows of India from 1991 to 2023 has been shown below.

$Log(x)_t = 2.633 + 0.0752log(x)_{t-8} + 0.027log(x)_{t-9}$

(11.14)* (0.27) (0.07)

$-0.284log(x)_{t-10} + 0.637log(x)_{t-11} + v_t$

(-0.76) (2.78)*

Where R^2=0.80, F=17.15*, DW=0.99, *=significant at 5% level, n=22, v_t= residual

Thus,

$V_t = Log(x)_t - [2.633 + 0.0752log(x)_{t-8} + 0.027log(x)_{t-9} - 0.284log(x)_{t-10} + 0.637log(x)_{t-11}]$

The long run path of cycles, cyclical trend and seasonal variation of the FDI inflows of India from 1991 to 2023 can be obtained by using STL method on v_t (residual) which is shown in Figure 4 where in panel 1 the cycle of FDI is found in which there are 5 peaks and 6 troughs respectively including small upswing and downswing. In panel 2, there are two troughs and one peak during the course of cyclical trend and the downward trend has longer path. Panel 3 specifies on the inverse v shaped seasonal

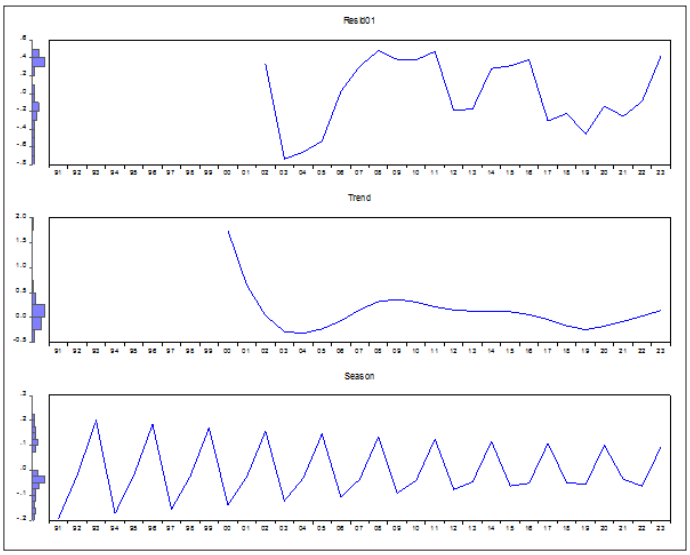

Figure 4: Decomposition of FDI inflows

If the Hamilton regression residual passes through the automatically selected ARIMA(p,d,q) model then we can get convergence or divergence process of the long run path of FDI inflows in terms of AR and MA sequences [42]. The estimated ARIMA (2,0,1) equation which is done through ARMA maximum likelihood (OPG-BHHH) method is given below.

$V_t = 0.0288 + 0.1596 v_{t-2} + 0.5244 \epsilon_{t-1} + 0.1112 \sigma^2_t$
(0.158) (0.55) (1.55) (2.27)*

Where R^2=0.24, F=1.90, AIC=1.01, SC=1.21, DW=1.81, n=22, *=significant at 5% level, AR roots=±0.40, MA root=-0.52, σ^2_t = volatility.

The estimated ARIMA (2,0,1) model is stable because all roots are less than one, even it is convergent because all the coefficients of AR and MA are less than one. But the model is insignificant because t values of AR and MA are not significant at 5% level, in spite of that its t value of σ^2_t is significant which implies that its volatility is minimum. The model is accepted since its AIC is minimum. Thus, ARIMA (2,0,1) model of FDI in terms of Hamilton residual has been converging towards equilibrium which has clearly visible in the Figure 5 below.

Figure 5: ARIMA (2,0,1) model

Unemployment rate in India during 1991-2023 has no unit root since null hypothesis Ho=log(y) has a unit root has been rejected at 5% level because ADF=-4.683 has the probability of 0.0258. But the ADF t statistic has a break point in 2022 which was examined through SIC with maximum lag 8 which is depicted in Figure 6.

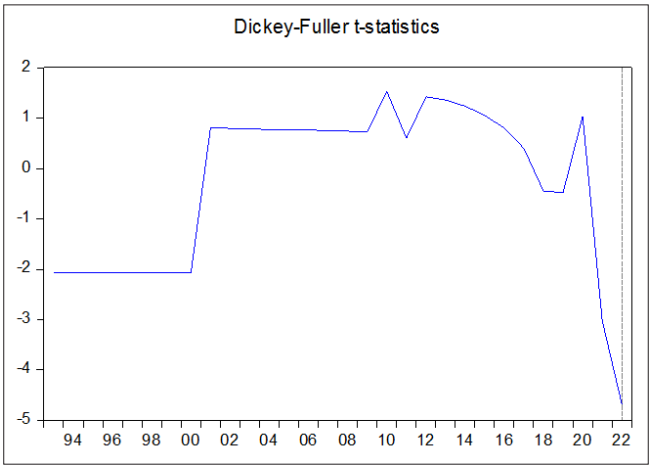

Figure 6: Break unit root at 2022

GDP capita in India during 1991-2023 has unit root since null hypothesis Ho=log(y) has a unit root has been accepted at 84% level because ADF=-2.666 has the probability of 0.8436. But the ADF t statistic has a break point in 2002 which was examined through SIC with maximum lag 8 which is depicted in Figure 7.

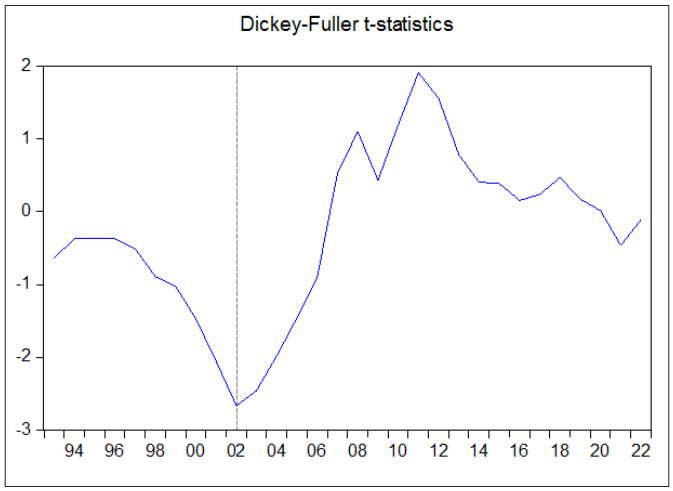

Figure 7: Break unit root at 2002

Cointegration and Vector Error Correction Analysis

The Johansen cointegration test [46] for the first difference series of FDI, unemployment rate and GDP per capita from 1991 to 2023 assume [i] no intercept & no trend[ii] intercept and no trend[iii] linear intercept and no trend[iv] linear intercept and trend [v] quadratic intercept and trend in which trace and max eigen statistic confirmed that they have cointegrated. The results are shown below in Table 1.

Table 1: Johansen cointegration test (5% significant level)

Data trend	none	none	linear	linear	quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	2	2	3	2	3
Max-Eigen	2	0	0	1	3

The best model is given below where it was seen that FDI, unemployment rate and GDP per capita has at least two cointegrating equations in trace statistic and one cointegrating equation in max-eigen statistic (in terms of log).

Table 2: Johansen Cointegration Test with Linear Intercept and Trend

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.603779	53.95466	42.91525	0.0028
At most 1 *	0.451659	26.18115	25.87211	0.0458
At most 2	0.238028	8.155381	12.51798	0.2392
Max-Eigen Statistic				
None *	0.603779	27.77351	25.82321	0.0273
At most 1	0.451659	18.02576	19.38704	0.0779
At most 2	0.238028	8.155381	12.51798	0.2392

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis p-values

The estimates of VEC are given below in Table 3.

Table 3: Estimated VEC

Error correction	dlog(x)	dlog(y)	dlog(z)
CointEq1	-0.432770	-0.064865	0.022208
	[-3.68428]*	[-1.68559]	[0.67746]
$d(\log(x)_{t-1}$	0.262092	0.030533	0.040306
	[1.60771]	[0.57170]	[0.88592]
$d(\log(x)_{t-2}$	0.193905	-0.026776	0.012585
	[1.45608]	[-0.61374]	[0.33862]
$d(\log(y)_{t-1}$	-1.228361	-0.895140	0.345209
	[-1.74224]	[-3.87540]*	[1.75443]
$d(\log(y)_{t-2}$	-0.980808	-0.376980	0.121540
	[-1.23088]	[-1.44408]	[0.54654]
$d(\log(z)_{t-1}$	2.241076	-0.045945	0.090184
	[3.08432]*	[-0.19301]	[0.44474]
$d(\log(z)_{t-2}$	0.067217	-0.158140	-0.103343
	[0.07961]	[-0.57170]	[-0.43857]
C	-0.058055	0.035071	0.058930
	[-0.61100]	[1.12666]	[2.22237]
R-squared	0.554721	0.485173	0.204191
F-statistic	3.915323	2.961825	0.806406
Akaike AIC	0.415811	-1.816054	-2.136706
Schwarz SC	0.789463	-1.442401	-1.763054

The estimated vector error correction implies that the impact on FDI by GDP per capita is positive but impact on FDI by unemployment is negative. The former is significant and the latter is insignificant. The impact on unemployment by FDI is positive in short run but negative in the long run. The impact on unemployment rate by GDP per capita is negative. The impact on GDP per capita by FDI inflows is positive and by unemployment rate is positive, both of which are insignificant. The cointegrating equation is observed as:

$$Log(w)=4.5108-0.1280t - 0.432Log(x)_{t-1} \underset{(-1.51)}{} \underset{(-3.68)*}{} -0.832log(y)_{t-1} \underset{(-0.406)}{}$$

$$-0.4905log(z)_{t-1} \underset{(-0.459)}{}$$

The cointegration equation expresses that it converges towards equilibrium insignificantly because the t values of coefficients of log(y) and log(z) are insignificant. The trend is also insignificant. But the convergent condition is significant (*=significant at 5% level, y=unemployment rate, z=GDP per capita).

It also implies that there is long run association among FDI inflows, unemployment rate and GDP per capita but this association becomes insignificant. In Figure 8, the cointegrating equation is plotted. It touches equilibrium level 8 times and departed away but moves towards equilibrium.

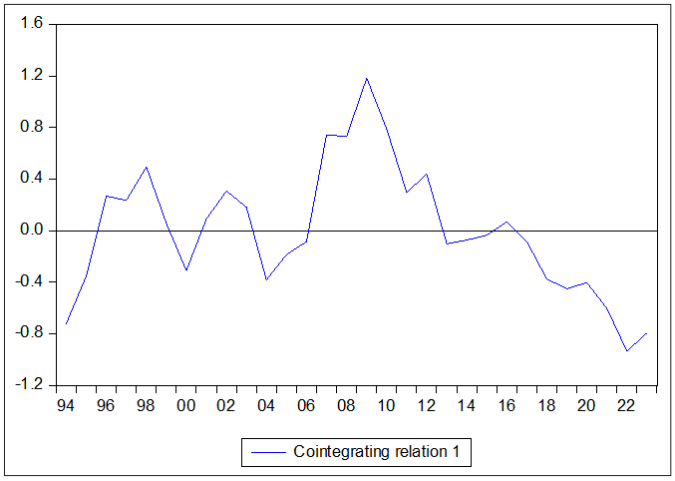

Figure 8: Cointegrating Equation

There is also a significant short run relation between FDI inflows and GDP per capita in India which was found from the Wald test(1943)[45] of the estimations of the system equations where Chi-square (2) = 9.599783 whose probability is 0.0082 and F statistic= 4.7998(2,22=df) whose probability=0.0186 respectively. But there are no other short run relations between other variables.

The VEC model is stable since its roots are not greater than one which are shown in the table below. But, it is not stationary because it has two unit roots.

Table 4: Values of Roots

roots	modulus
1.000000	1.000000
1.000000	1.000000
0.718180 - 0.359494i	0.803130
0.718180 + 0.359494i	0.803130
-0.452662 - 0.441390i	0.632240
-0.452662 + 0.441390i	0.632240
-0.469038	0.469038
0.002745 - 0.364263i	0.364273
0.002745 + 0.364263i	0.364273

In Figure 9, the roots are lying inside or on the unit circle which is given below.

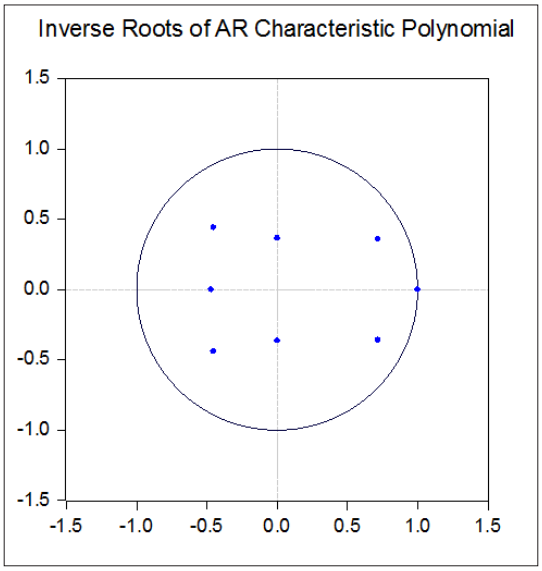

Figure 9: Unit Circle

All the DW values which were found in the estimated equations confirm that the model suffers from autocorrelation problems. In Figure 10, the ACF showed the vertical lines which vary from positive to negative values in all the cases.

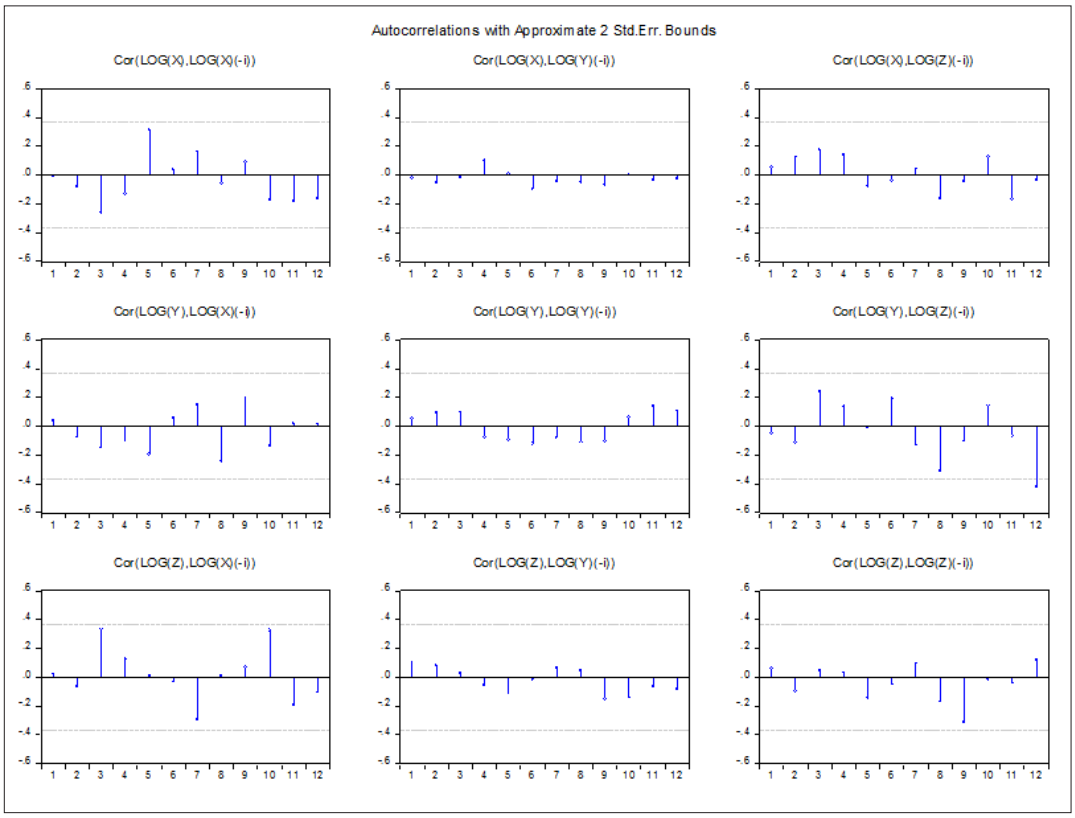

Figure 10: Autocorrelation Problems

The impulse response functions with Cholesky one standard deviation do not merge towards equilibrium significantly but response of log(z) to log(x) reached equilibrium after 7 years, response of log(x) to log(y) reached equilibrium after 5years, response of log(z) to log(y) reached equilibrium many times, response of log(x) to log(z) reached equilibrium after 8 years, respectively. All these are visible in Figure 11.

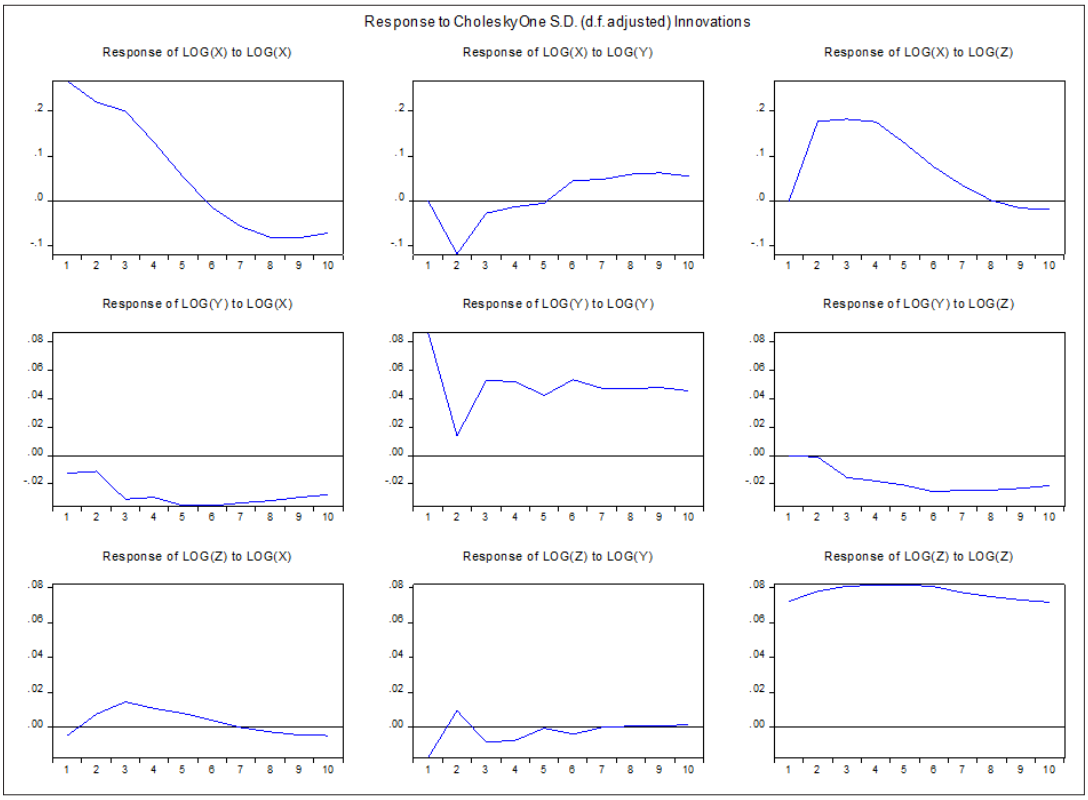

Figure 11: Impulse Response Functions

Limitations and Future Scope of Research

Impact of FDI inflows on many macro and micro variables were observed in India but the paper analyses only two variables such as unemployment and GDP per capita during 1991-2023.The impact of FDI inflows on agriculture, manufacturing and service sector in India was excluded here which has bright scope of research in the offing. Even impact of FDI inflows on international and climate change policies have enough scope of research in India. Sectoral employment can be related with FDI inflows which should be explored in Indian economy.

Policies to be Considered

According to observations of the model, the paper may suggest to increase employment as an impact of FDI inflows in MSME, agricultural marketing and mechanisation, roads and transportations, production of electricity and so on that might increase GDP in the offing. Moreover, FDI inflows directly increase GDP per capita via increase in output level by catapulting effective demand.

Conclusion

The paper concludes that FDI inflows in India from 1991 to 2023 have been growing at the rate of 16.98% per year and it had nonlinear trend and showed cycles with 5peaks and 6 troughs having cyclical trend with two troughs and one peak and inverse v shaped seasonal variation. It has break unit root at 2005 and marches towards equilibrium through ARIMA (2,0,1) model. Johansen rank test [46] confirms that FDI inflows, unemployment rate and GDP per capita have two cointegrating equations in trace statistic and one cointegrating equation in max eigen statistic where vector error correction model states that FDI inflows have positive relation with GDP per capita and have negative relation with unemployment rate. The cointegrating equation moves towards equilibrium insignificantly, however, it implies a long run relationship among them. There is a short run relation between FDI and GDP per capita [45]. There is no impulse response of FDI to unemployment rate and GDP per capita. The vector error correction model is non-stationary.

References

1. Yao S (2006) On Economic Growth, FDI and Exports in China. Applied Economics 38: 339-351.
2. Yucel GE (2014) FDI and Economic Growth: The Case of Baltic Countries. Research in World Economy 5: 115-134.
3. Bhattarai K (2016) FDI and Growth. Advances in Management & Applied Economics 6: 1-23.
4. Bhowmik D (2018) Financial Crises and Nexus Between Economic Growth and Foreign Direct Investment. Financial Markets, Institutions and Risks 2: 58-74.
5. Aitken B, Harrison A (1999) Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. American Economic Review 89: 605-618.
6. Lipsey RE (2002) Home and host country effects of FDI. NBER Working Paper No. 9293. https://www.nber.org/system/files/working_papers/w9293/w9293.pdf.
7. Herzer Dierk (2010) How does foreign direct investment really affect developing countries' growth?, IAI Discussion Papers, No. 207, Georg-August-Universität Göttingen, Ibero-America Institute for Economic Research (IAI), Göttingen https://www.econstor.eu/bitstream/10419/57319/1/641054777.pdf.
8. Gocer I, Mercan M, Peker O (2013) İhracat, Doğrudan Yabancı Yatırımlar ve İşsizlik: Türkiye Örneği. Business and Economics Research Journal 4: 103-120.
9. Zeb N, Qiang F, Sharif MS (2014) Foreign Direct Investment and Unemployment Reduction in Pakistan. International Journal of Economics and Research 5: 10-17.
10. Kurtovic S, Siljkovic B, Milanovic M (2015) Long-term Impact of Foreign Direct Investment on Reduction of Unemployment: Panel Data Analysis of the Western Balkans Countries, Journal of Applied Economics and Business Research 5: 112-129.
11. Bayar Y (2014) Effects of Economic Growth, Export and Foreign Direct Investment Inflows on Unemployment in Turkey. Investment Management and Financial Innovations 11: 20-27.
12. Mucuk M, Demirsil MT (2013) The Effect of Foreign Direct Investment on Unemployment: Evidence from Panel Data for Seven Developing Countries. Journal of Business, Economics and Finance 2: 53-66.
13. Djambaska E, Lozanoska A (2015) Foreign Direct Investment and Unemployment: Evidence from the Republic of Macedonia. International Journal of Economics, Commerce and Management United Kingdom 3: 73-85.
14. Bayar Y, Sasmaz MU (2017) Impact of Foreign Direct Investment on unemployment in emerging market economies:A cointegration analysis.International Journal of Business and Economic Sciences Applied Research 10.
15. Estrin S (2017) Foreign direct investment and employment in transition economies. IZA World of Labor 330.
16. Ezzat A (2019) The impact of foreign direct investment on unemployment:Evidence from Arab countries https://doi.org/10.21608/jsec.2019.94610.
17. Strat VA, Davidescu A, Paul AM (2015) FDI and The Unemployment -A causal analysis for the Latest EU members. Procedia Economics and Finance 23: 635-643.
18. Haddad AM (2016) Analysis of foreign direct investment and unemployment and their impact on economic growth in Jordan. International Journal of Investment Management and Financial Innovations 2: 1-12.
19. Craigwell R (2006) Foreign Direct Investment and Employment in the English and Dutch-Speaking Caribbean. International Labour Organization https://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-port_of_spain/documents/meetingdocument/wcms_306245.pdf.
20. Sjöholm F, Lipsey RE, Jing S (2010) Foreign Ownership and Employment Growth in Indonesian Manufacturing. IFN Working Paper No 831.
21. Shaari MS, Hussain NE, Halim MS bin Ab (2012) The Impact of Foreign Direct Investment on the Unemployment Rate and Economic Growth in Malaysia. Journal of Applied Sciences Research 8: 4900-4906.
22. Golding K, Masih M (2018) Does foreign direct investment lead or lag employment?An ARDL approach. MPRA Paper No-109300 https://mpra.ub.uni-muenchen.de/109300/.
23. Zdravković A, DJukić M, Bradić-Martinović A (2017) Impact of FDI on unemployment in transition countries: Panel cointegration approach. Industrija 45: 161-174.
24. Simionescu PSMD, Simionescu MD (2017) The Connection between Foreign Direct Investment and Unemployment Rate in the United States. Working papers Globalization - Economic, Social and Moral Implications, April 2017 18, Research Association for Interdisciplinary Studies DOI: 10.5281/zenodo.581785.
25. Yilmaz B, Mahmut Unsal S (2017) Impact of foreign direct investments on unemployment in emerging market economies: A co-integration analysis. International Journal of Business and Economic Sciences Applied Research 10: 90-96.
26. Johnny N, Timipere ET, Krokeme O (2018) Impact of

Foreign Direct Investment on Unemployment rate in Nigeria (1980-2015). International Journal of Academic Research in Business and Social Sciences 8.

27. Bhowmik D (2018) Financial Crises and Nexus Between Economic Growth and Foreign Direct Investment. Financial Markets, Institutions and Risks 2: 58-74.
28. Karimov M, Parádi-Dolgos A, Koroseczné Pavlin RA (2020) An Empirical Analysis of the Relationship between Foreign Direct Investment and Unemployment Rate:Evidence from Turkey. European Research Studies Journal 23: 453-464.
29. Alalawneh MM, Nessa A (2020) The Impact of Foreign Direct Investment on Unemployment: Panel Data Approach. Emerging Science Journal 4.
30. Al-Masbhi GSA, Du Y (2020) The Impact of FDI on GDP Growth and Unemployment in Yemen. Advances in Economics, Business and Management Research 159: 17-23.
31. Liang C, Shah SA, Bifei T (2021) The Role of FDI Inflow in Economic Growth: Evidence from Developing Countries. Journal of Advanced Research in Economics and Administrative Sciences 2.
32. KadišaT, Butkus M, Aleksandravičienė A (2021) Effect of Foreign Direct Investment on Growth-Unemployment Nexus. SOCIALINIAI TYRIMAI 44: 139-152.
33. Fuhrmann R (2020) Okun's Law: Economic Growth and Unemployment. https://www.investopedia. com/articles/economics/12/okuns-law.asp.
34. Umair M, Ullah R (2013) Impact of GDP and Inflation on Unemployment Rate: A Study of Pakistan Economy in 2000-2010. International review of management and business research 2: 388-400.
35. An Z, Ghazi T, Prietto NG (2017) Okun's Law: Unfit for Low and Lower Middle Income Countries? https://www.imf.org/external/np/seminars/eng/2016/GlobalLaborMarkets/pdf/Ghazi_Session1_paper.pdf.
36. Pizzo A (2019) Literature Review of Empirical Studies on Okun's Law in Latin America and the Caribbean. Employment Policy Department 252: 1-45.
37. An Z, Ball L, Jalles JT, Loungani P (2019) Do IMF forecasts respect Okun's law? Evidence for advanced and developing economies. International Journal of Forecasting 35: 1131-1142.
38. Said RM, Al Baqy AAA, Mohammed HA, Okasha SAED, Shaaban SM (2022) The Relation Between FDI and Unemployment: An Empirical Study on Egypt.International journal of public policies in Egypt 1: 116-138.
39. Woldetensaye WA, Sirah ES, Shiferaw A (2022) Foreign direct investments nexus unemployment in East African IGAD member countries a panel data approach. Cogent Economics & Finance 10.
40. Nguyen AT (2022) The relationship between economic growth, foreign direct investment, trade openness, and unemployment in South Asia. Asian Academy of Management Journal 27: 21-40.
41. Stepanok I (2023) FDI and unemployment, a growth perspective. Review of International Economics 31: 761-783.
42. Hamilton JD (2018) Why you should never use the Hodrick Prescott Filter. Review of Economics and Statistics 100: 831-843.
43. Cleveland RB, Cleveland WS, McRae JE, Terpenning I (1990) STL: A seasonal-trend decomposition. Journal of Official Statistics 6: 3-73.
44. Box G, Jenkins G (1976) Time Series Analysis, Forecasting and Control. San Francisco: Holden Day http://garfield.library.upenn.edu/classics1989/A1989AV48500001.pdf.
45. Wald A (1943) Test of Statistical Hypothesis concerning several parameters when the number of observations is large. Transactions of American Mathematical Society 54: 426-82.
46. Johansen S (1988) Statistical Analysis of Cointegrating Vectors. Journal of Economic Dynamics and Control 12: 231-254.