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Causal Relationship between Foreign Direct Investment, Growth and Exports: An Anecdote from Oecd Countries

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Abstract: ***In the globalised world of today there is a process of integration between the countries and one way of integrating is by trade. In this instance export led growth surfaces and arises as an imperative factor. In the related pretext works offers rich acumens regarding role of Foreign Direct Investment and economic growth. In this paper we study the causal relationship between Foreign Direct Investment (FDI) and Exports on Growth of select 30 OECD countries. As a measure of economic growth Industrial Production Index (IPI) is used in the study. To examine the relationship Augmented Dickey Fuller Test and Phillip Perron Test was employed to test the unit Root and to examine the long term equilibrium relationship and direction of causality Johansen's cointegration test and Granger causality was used. The study reveals important cointegrating relationship between IPI and FDI and IPI and Exports in 22 and 23 sample OECD countries respectively. In Granger lead relationship between IPI and FDI three bilateral relationships were revealed in Canada, Czech Republic and Spain and 16 Unilateral relationships were revealed in the same .In granger led relationship between FDI and IPI only 9 Unilateral relationships were revealed. In IPI and Exports only one bilateral Granger lead relationship was revealed in Finland followed by 6 unilateral relationships. In granger lead relationship between Exports and IPI 16 Unilateral relationship was exhibited. Hence to achieve economic growth FDI and exports are majorly instrumental. The empirical findings suggest that OECD countries should continue the policy aimed at attracting FDI and expanding the exports sector in FDI led Growth and exports led growth. This study has some major implications in strategizing FDI and export policies for OECD region.***

Keywords: ***Johansen's Cointegration, Stationarity, Growth, Exports, Foreign Direct Investment***

I. INTRODUCTION

The progression of global production is mainly determined by factors like technology, liberalization of FDI and Trade Policies expedite and assist this growth. In this milieu and framework, Liberalisation and Globalization deals and bid a unique chance for many countries to realise faster Economic Growth through investment and trade strategies.

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In the year 1970 there was an exceptional rapid rise in International Trade compared to FDI and was the most vital International economic activity. There was a drastic change in the situation in the year 1980 with sharp rise in FDI.

Across globe importance of FDI has increased many folds by transmitting and relocating technologies and forming procuring and networks of marketing for international production and sales (Shujiro Urata, 1998).There is a win-win situation for both foreign investors by employing their assets and resources efficiently through FDI and also for recipients by obtaining know-hows i.e. best technologies and getting convoluted into their worldwide trade networks of production. The relationship between Exports, FDI and Economic Growth is complex and intrinsically interlinked. Foreign markets can very well be served by Market-seeking firms by foreign subsidiaries or through export sales. The latter can efficiently locums Foreign Direct Investment for trade. On the other hand allies of foreign firms in turn create trade flows which are new with parent companies and can export to other countries or back to the home country, thereby rise in trade activity. Trade can clearly pull attention to resources and markets that can focus investment prospects and opportunities. Foreign Direct Investment can be complemented and substituted by Domestic investment and for some given opportunity like in case of Joint Ventures or Leveraging FDI becomes complementary to upsurge economic activity and also bring prompt rise in trade. The prominence of introducing innovative knowhow, Skills and management skills by backward linkages has developed the expansion and development thinking. "Backward linkages are the contracts amongst the foreign affiliates of a Multinational Enterprises and resident and local suppliers of products used directly or indirectly in the production or provision by the foreign affiliate's product or service". It encloses actions of persons, demo effects and mounting competition. OECD Guidelines for Multinational Enterprises especially boost indigenous capacity building, and if you take the case of domestic investment and outlay usually dwarfs FDI. Foreign Direct Investment which is linked with trade is promoter for innovation, enriched output and unrelenting development. Backward linkages are deliberated the most firm constructive and boosting spill over (OECD, 2002a).In this backdrop of intensifying and growing use of trade-intensive FDI and varying landscape and environment of the global value chain, host and home countries may need to be ever more assiduous and duteous to refurbish and recommence the policies to ensure that best practices are in place to capture and internment value for their components.

There is a positive correlation between openness of trade with that of investment in many empirical studies and is revealed to be the explanatory variable. There is a substantial advantage in terms of openness of trade through specialisation and economies to scale, and above all if the trade disorders are completely distant and detached economic factors can become the key issues of an stakeholder's choice of location (UNCTAD, 2003). In this paper we examine the causal and underlying relationship between Foreign Direct Investment (FDI) and Exports on Growth of select 30 OECD countries.

II. REVIEW OF LITERATURE

Table 3: Results of Johansen's Co-Integration Test of sample series, (IPI and FDI) and (IPI and Exports)

Year	Author	Data Methodology used	Objectives	Results
1996	(Xu, 1996)	Log real output real export of selected developing economies using Cointegration Granger's causality during the period from 1976 to 1992.	To find out causality between "exports and economic growth".	Long-run equilibrium between "real GDP and real exports".
2008	(Yang & Yang, 2008)	Panel data applied in 110 countries from Africa, North America, Europe and Asia for the period from 1973 to 2002.	To find out the relationship between "foreign direct investment inflow and economic growth".	Results were mixed over time and across regions. FDI positively affect the economic growth in Latin America, but affected negatively in the Middle East. Positive growth experienced because of FDI in OECD and ECA countries also. While Africa experienced negative growth. In other countries and regions there were no significant impact found.
2015	(Mohammed, Mosté, & Mohammed, 2015)	Cointegration and panel Granger's causality tests applied in panel data of cross-country observations from a set of 65 economies over the period of 1980–2010.	To find out causality between economic growth and foreign direct investments in 65 countries.	Results show a disparity and unidirectional causality from foreign direct investment economic development.
2015	(Pegkas, 2015)	"Fully-Modified-OLS (FMOLS)" and "Dynamic-OLS (DOLS)" methods are used in panel data set to find the relationship between factors in Euro zone countries over the period of 2002–2012.	To find out the relationship between the "economic growth and foreign direct investments" and estimate the effect of FDI on GDP.	Results show affirmative long-run cointegrating relationship between "economic growth and foreign direct investments" and stock of FDI is an important factor that has a positive impact on economic growth in the Euro zone countries.
2018	(Dike, 2018)	Dynamic "panel vector error correction model" technique applied in SSA counties for the period from 1995 to 2016.	To find out possible long-run positive relationship between "economic growth and Foreign Agricultural Investments" in the SSA region.	Results show positive relationship between "economic growth and Foreign Agricultural Investment" in the period of long run.
2012	(Mah, 2010)	Co-integration test and Granger causality test applied in China during 1983 to 2001.	To find out causality between "economic growth and foreign direct investments" inflows.	Results show FDI inflows have no effect on economic growth, but latter has an impact on former.
2013	(Wan, 2013)	Cointegration tests applied to evaluate a long- run relationship among selected variables and fixed effects models to find out the magnitude of foreign direct investments contributions on other selected factors using panel data of selected 19 nations of the G20 for the period from 1971 to 2009.	To find out impact of foreign direct investment (FDI) net inflows on carbon emissions, clean energy use, and GDP.	Analysis shows that foreign direct investments have played significant part in growth for selected G20 countries.

2015	(Iamsiraroj & Ali, 2015)	Econometric analysis applied on selected data of 140 countries for the period ranging from 1970 to 2009.	To find out foreign direct investment led growth through an "informed econometric analysis predicated on substantial guidance" found from a vast investigation of 880 estimates analysed in 108 past published studies.	Results show FDI positively affects economic growth and this relationship found true strongly worldwide as well as in the developing economies.
2008	(Herzer, Klasen, & D, 2008)	Growth led by foreign direct investment hypothesis is tested for 28 developing countries (among them 10 are from Latin America, 9 from Asia and 9 from Africa) using co-integration technique on a country-on-country basis during 1970-2003.	To challenge the assumption that foreign direct investments generally positively affect economic growth in developing economies.	Results show positive unidirectional long-term effect of FDI on GDP is not found in any country.
2019	(Dinç & Gökmen, 2019)	Econometric methods are used on the annual data set selected for the period of 1960–2017. After completing the analyses it was found that the VAR model was structurally consistent, in the next step co-integration analysis is applied. Tests used are Johansen–Juselius (JJ) cointegration test (Johansen & Juselius, 1990).	To test the assumption that there is a positive impact of total "exports on economic growth" in Brazil.	Results show that bi-directional causal relationship was found in Brazil since 1960s between exports and economic development in the long time period further-more, in the short-run, there is economic growth led by exports.
2019	(Hagemejer, 2019)	Panel data methods applied to identify the determinants of economic growth of exported value added and find out the important growth drivers in the selected time period from 1995 to 2014.	To evaluate significance of global value chains (GVC) participation in exports for economic growth.	Results show that economic growth in the Central and Eastern European (CEEC) economies to show that in a major part of the time period of transition and integration with the EU, exports have played a significant role in economic growth.
2018	Ozkan B, Dube AK (2018)	Study used long run data for the period from 1970 to 2016 Vector Autoregressive Model, Johansen Cointegration technique, and Granger's Causality used.	To find out long run dynamic relationship between "economic growth, foreign direct investment and exports" in Ethiopia	The analysis reveals unidirectional causal flow from "foreign direct investment and export to economic growth".
2015	(Devi, 2015)	Review of Literature	To investigate the effect of "foreign direct investment (FDI) on economic growth" of BRICS countries.	In the study it was found that "foreign direct investment has an effect on the growth" of all types of economies.
2015	(Agrawal, 2015)	cointegration and causality analysis at panel level.	to examine the relationship between "economic growth and foreign direct investment (FDI)" in the five BRICS economies.	Results reveal that "economic growth and foreign direct investments" are co-integrated at the panel level, and indicate the existence of long run equilibrium relationship between these factors. Results from causality tests reveal that there is long run causality flowing from "foreign direct investment to economic growth" in selected economies.

2019	(Hosein, 2019)	ARDL bounds test approach applied to assess cointegration on the variables for Saint Lucia from the period from 1980-2015.	To estimate causal relationships among "FDI, exports, and GDP".	The results reveal that selected variables follow a long period relationship when "economic growth and foreign direct investment" are the dependent variables. Using Todamamoto test to establish long-run causality, results show bi-directional causality between "economic growth and foreign direct investments", unidirectional causal relationship from exports to economic growth, and, "unidirectional causality from FDI to exports". In the second part, this study finds presence of growth led by export and growth led by FDI in Saint Lucia.
2018	(Ahmad, Draz, & Yang, 2018)	Unit root test, cointegration and causality tests are used in panel data for a period for a period from 1981 to 2013.	To find out causality between "foreign direct investment, exports, and economic growth" among the ASEAN5 economies.	The analysis reveals bi-directional causality between "economic growth and foreign direct investments" in the longer time period, while in short run, there is a unidirectional causality from foreign direct investment to exports. In the study it was found that the growth led by export and growth led by FDI assumption found reliable in the longer and shorter time period.
2010	(Andraz & Rodrigues, 2010)	Unit root test, cointegration and causality tests are used applied to annual data for a period from 1977 to 2004.	To analyze possibility of causal relationships between inward "foreign investment, exports and economic growth" in Portugal and find out their direction.	Results support that "foreign direct investment and exports foster economic growth" in the longer-run while there is a bi-directional causal relationship between "foreign direct investment and economic growth" in the short-run and a uni-directional causal relationship flowing from foreign direct investment to exports.
1999	(Mello, 1999)	In the sample of 32 OECD and non-OECD economies time series and panel data are used for the period from 1970 to 90.	To analyse the relationship between foreign direct investment (FDI) and capital formulation, and output and total factor productivity (TFP) growth in the country receiving FDI.	The analysis finds that FDI is enhanced growth depending on the degree of complementarily and substitution between and domestic investment foreign direct investment.
2014	(Feeny, Iamsiraroj, & Mcgillivray, 2014)	To establish relationship "between economic growth and foreign direct investments" in the data set of 209 economies for the period from 1971 to 2010. Dynamic panel estimators like "Difference and System General Method of Moments (GMM)" models have been used.	To investigate the effect of "Foreign Direct Investment (FDI) on Economic Growth" in the Pacific region.	The study reveals that there is less impact of FDI in Pacific economies as compared to the impact in host economies on average.

2009	(Ghosh & Wang, 2009)	A cross country regression was used in the panel data of 25 OECD economies for the period from 1980 to 2004.	To investigate the Impact of outward FDI on source country economic growth.	Results show that there is a positive correlation between inward and outward FDI and economic growth of host and source country. However, the impact of "foreign direct investment on economic growth" is not so strong.

III. DATA AND METHODOLOGY

Data

This section describes the data and outlines the methodology used in selection of the indicators. The data set used in this study is from (1984 to 2018) i.e. **35 years** of **30 OECD Countries** namely Australia, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Korea Repulic, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Turkey. United Kingdom, United States, Brazil, Chile, Columbia, Indonesia, Israel, South Africa, Japan, Iceland, Hungry see: Table 1

Table 1: List of Sample series: 30 OECD Countries

Australia	Canada	Czech Republic	Denmark	Hungry	France
Germany	Greece	Italy	Korea Repulic	Iceland	Mexico
Netherlands	Norway	Poland	Portugal	Japan	Slovak Republic
Spain	Sweden	Turkey	United Kingdom	South Africa	United States
Brazil	Chile	Columbia,	Indonesia	Finland	Israel

The table shows the sample OECD Countries used in the study. The period of study is from 1994 to 2018 i.e 35 years data, however there is a variation in the beginning data of some countries.

The selection of the countries mentioned above is on the basis of availability of data. There are many measures of **economic growth** like real GDP, Industrial Production Index etc which are used to measure economic growth which tells us how much a country's production has increased or decreased in comparison with the previous year. In this study, Industrial Production Index (IPI) is used as a proxy of Economic growth and its statistics has been taken from www.oecd.org.Exports and FDI data used in the study has been taken from World Development Indicators of World Bank (www.databank.worldbank.org)

METHODOLOGY: Firstly an attempt is made to understand the properties of the data from an econometric perspective and then to understand long term dynamics of the sample series Johansson cointegration method is employed to create the equilibrium relationship among IPI and exports and IPI and Foreign Direct Investment (FDI). Test of causality, Granger Causality Test is executed and the results of the test are provided in analysis section. The regression analysis would have provided effective estimates provided the variables used in the study are stationary. In this study we use cointegration test to understand long term dynamics of sample data which is non-stationary.

The Augmented Dickey Fuller (ADF) 1981 and Phillips and Perron (1988) is used to test the stationarity of sample series of 30 select OECD countries, which uses existence of a unit root as the null hypothesis.

IV. ANALYSIS AND INTERPRETATIONS OF RESULTS

The tests of stationarity results are shown in Table no 2. The outcomes of the study are shown in Table 2, endorse non-stationarity of sample data; then tests of stationarity are repeated on first difference. Table pronounces the sample series that is verified using ADF test. The null hypothesis assumption is that the sample series has a unit root. In this study another test of stationarity i.e. Phillips and Perron (1988) is also used for the series and subsequently it is done on first difference. Panel A and B shot results of sample data. The first difference series show stationarity and it endorses that sample series data have first order integration for all 30 OECD countries taken in the sample.

Insert Table 2 here

If two sample series are non-stationary but its combination in linear relationship is stationary, then we can state the sample data series have cointegrating relationship. If the sample data are included of the same order, cointegration methods are used to decide the existence of a persistent long run relationship amongst sample data.

The linkage between IPI, Exports and FDI is inspected using cointegration test (Johansen, 1991) and this test has following advantage, it discloses the extent to which sample data change collected to long run stability. The cointegrating vector recognizes the presence of long run equilibrium. Cointegrating methodology starts with non-stationary feature of series which are at level and curtails the inconsistency that rises from the nonconformity of stability in the long run. It is hypothetically appealed that if IPI, FDI and Exports are cointegrated, then it suggests existence of causation at least in one way. If level series are integrated of the same order, it doesn't mean that both level series are cointegrated. Cointegration suggests linear combinations of level series terminating the stochastic trend, thus creating a stationary series.

In computation and applying of "Johansen's cointegration test" there is a significant importance of lag length, which otherwise would create difficulties of problems of under parameterization and under parameterization.

There should not be any serial correlation in the series, for which valuation is done to safeguard this parameter. There are many information criteria available in the literature but in this particular study we use Akaile Information Criteria (AIC) ,which could help us in getting the important information about optimal lag length and the same has been used in calculations. The cointegration results are reported in Table 3. of sample series ,(IPI and FDI) and (IPI and Exports).

Insert Table 3

Trace test statistics and maximal Eigen Maximal Eigen value are used to interpret the results .whether cointegration exists between the sample series or not. If null hypothesis is rejected (r = 0) it suggests at least one co-integrating vector which approves a long run equilibrium and if it is rejected (r =1) it shows no cointegrating relationship in sample series. Association is tested between the two series (IPI &FDI) and (IPI &Exports) in our case. The null hypothesis is rejected for (IPI &FDI) in 22 OECD sample countries where as there is a rejection of null hypothesis for (IPI &Exports) in 23 countries, which divulges that one cointegration relationship occurs between sample series.

Granger Causality is used to examine the direction and trend of causality. The empirical results of Granger Causality between (FDI & IPI) and (IPI and Exports) are given in Table 4.

Insert Table 4 Here

In sample series (IPI and FDI) out of 30 sample OECD countries there are only 3 countries in which bilateral Granger Causality is showed namely Czech Republic ,Canada, and Spain.

There are bi-directional Granger lead relationships which are significant at 5% level and Unilateral Causality between IPI and FDI is observed in 16 countries namely; USA, Canada, Sweden, Czech Republic, Finland, Spain, Germany, UK, Turkey, Mexico, Indonesia, France, Columbia, South Africa. Denmark and Israel, and if we see granger relationship of FDI causing IPI then this relationship is revealed in 9 countries namely ;Australia,Canada,Czech Republic, Greece, Hungry ,Iceland, Italy, Netherlands and Spain.. In sample series (IPI and Exports) out of 30 sample OECD countries there is only 1 country namely Finland in which bilateral Granger Causality lead relationship is exhibited which is significant at 5% level. In 6 countries namely; Finland, Hungry, Netherlands, Poland, Columbia, South Africa Unilateral granger lead relationship is exhibited i.e. IPI granger causing Exports. In case of Exports Granger lead relationship with IPI 16 countries reveal this relationship namely; Spain, Canada, Australia, Denmark, Iceland, Greece, Portugal, Sweden, USA, Finland, France, Indonesia, Italy, Chile, Norway and Turkey. However there are 4 countries namely Japan, Korea Republic, Brazil and Slovak Republic No Cointegration and Granger lead relationship was revealed.

Among the issues of marketable openness, export diversification and FDI remain substantial in prompting export-led economic progress to accomplish and reach global integration and trade openness. To achieve the economic growth exports is a very important component, especially when we see in many states the case of commercial growth; it has been defined as export-led growth.

Evolving works assumes that supporting policy which is driven by growth led by exports is fundamental and at the core of economic and monetary development.

Export-led economic growth includes factors like, learning by international trade, export composition, export competitiveness, divergence of exports, and relative benefit of products.

Growth in exports prompts and pledges growth in the economy by providing the foreign exchange; this in turn simplifies the import of transitional goods that are vivacious for the development of an economic growth policy which is led by exports. Openness in trade is definitely a decisive issue in the global trade, growth led by exports and for the integration and amalgamation of indigenous economics with that of the world. The encouraging influence of liberalization in trade unbridles with the progression led by exports policy and open economies can acceptably avert the balance of payment issues by means of, foreign exchange inflow, collective exports and supplementing the output. Therefore, it is clearly indicated that there is a statistical important correlation among growth, exports, and investment as exposed in our results stated above in this section.FDI is also significant constituent of economic growth and has also been proved in this study. In developing and less developed economies, growth centered governments have been equaling to stimulate to foreign capital to catalyst economic growth also to upsurge the foreign marketable capacity. As shown by the results economic growth shall boost FDI inflows (Aditya & Acharyya, 2013; Naude, Bosker, & Matthee, 2010; Ramananyake & Lee, 2015). Growth is one of the most significant origins for economic growth.

V. SUMMARY CONCUSIONS AND IMPLICATIONS OF THE STUDY

The determinants of economic growth are a strategic issue in economics. The economic literature has defined several components for economic growth, such as policies, geography and institutions. Among these components, policies are generally defined by policies for economic integration and openness. The progression of international production is mainly determined by technological and factors and Liberalization of FDI and Trade Policies expedite and assist this growth. In this milieu and framework, Globalization deals and bid a unique chance for many countries to realise faster Economic Growth through Trade and Investment strategies. The empirical evidence pieced together from scattered sources suggests FDI and Exports plays a significant role in economic growth of the country. In this paper we examine the causal relationship between Foreign Direct Investment (FDI) and Exports on Growth of select 30 OECD countries. We employed Industrial Production Index (IPI) as a measure of Economic Growth. To empirically examine the relationship Augmented Dickey Fuller Test and Phillip Perron Test was employed to test the unit Root and to examine the long term equilibrium relationship and direction of causality Johansen's cointegration test and Granger causality was used. The study reveals cointegrating relationship between IPI and FDI and IPI and Exports in 22 and 23 sample OECD countries respectively. In Granger lead relationship between IPI and FDI three bilateral relationships were revealed in Canada, Czech Republic and Spain and 16 Unilateral relationships were revealed in the same .In granger led relationship between FDI and IPI only 9 Unilateral relationships were revealed. In IPI and Exports only one bilateral Granger lead relationship was revealed in Finland followed by 6 unilateral relationships. In granger lead relationship between Exports and IPI 16 Unilateral relationship was exhibited. Hence FDI and Exports are majorly instrumental in Economic growth of OECD countries. The findings of this study suggest that OECD

countries should continue the policy aimed at attracting FDI and expanding the exports sector in FDI led Growth and exports led growth. This study has major implications in strategizing FDI and export policies in OECD region.

REFERENCES

1. Agrawal, G. (2015). Foreign Direct Investment and Economic Growth in BRICS Economies : A Panel Data Analysis. 3(4), 1–4. https://doi.org/10.7763/JOEBM.2015.V3.221
2. Ahmad, F., Draz, M. U., & Yang, S. (2018). Causality nexus of exports , FDI and economic growth of the ASEAN5 economies : evidence from panel data analysis. The Journal of International Trade & Economic Development, 0(0), 1–16. https://doi.org/10.1080/09638199.2018.1426035
3. Andraz, J. M., & Rodrigues, P. M. M. (2010). What causes economic growth in Portugal : exports or inward FDI ? 37(3), 267–287. https://doi.org/10.1108/01443581011061276
4. Devi, S. (2015). Foreign Direct Investment and Growth in BRICS Countries : A Review. 4(4), 2013–2015.
5. Dike, C. (2018). Effects of Foreign Direct Investment in Sub-Saharan Africa Economic Growth : Evidence from Panel Data Analysis. 8(2), 255–261.
6. Dinç, D. T., & Gökmen, A. (2019). Export-led economic growth and the case of Brazil : An empirical research. Journal of Transnational Management, 24(2), 122–141. https://doi.org/10.1080/15475778.2019.1609895
7. Feeny, S., Iamsiraroj, S., & Mcgillivray, M. (2014). Growth and Foreign Direct Investment in the Paci fi c Island countries ☆ , ☆☆. Economic Modelling, 37, 332–339. https://doi.org/10.1016/j.econmod.2013.11.018
8. Ghosh, M., & Wang, W. (2009). Does FDI Accelerate Economic Growth ? The OECD Experience Based on Panel Data Estimates for the Period 1980-2004 Does FDI Accelerate Economic Growth ? The OECD Experience Based on Panel Data Estimates for the Period 1980-2004 ∗. 9(4).
9. Hagemejer, J. (2019). Export-led growth and its determinants Evidence from CEEC countries ∗. https://doi.org/10.1111/twec.12790
10. Herzer, D., Klasen, S., & D, F. N. (2008). In search of FDI-led growth in developing countries : The way forward. 25, 793–810. https://doi.org/10.1016/j.econmod.2007.11.005
11. Iamsiraroj, S., & Ali, M. (2015). Foreign direct investment and economic growth : A real relationship or wishful thinking ? ☆. 51, 200–213. https://doi.org/10.1016/j.econmod.2015.08.009
12. Lucia, S. (2019). FOREIGN DIRECT INVESTMENT , EXPORTS AND ECONOMIC GROWTH IN SIDS : EVIDENCE FROM SAINT LUCIA. 72(1), 47–76.
13. Mah, J. S. (2010). Foreign direct investment inflows and economic growth of China. 32, 155–158. https://doi.org/10.1016/j.jpolmod.2009.09.001
14. Mello, B. L. R. De. (1999). Foreign direct investment-led growth : evidence from time series and panel data. 51, 133–151.
15. Mohammed, S., Mosté, B., & Mohammed, G. (2015). Causal Interactions between FDI , and Economic Growth : Evidence from Dynamic Panel Co-Integration. 23(October 2014), 276–290. https://doi.org/10.1016/S2212-5671(15)00541-9
16. Pegkas, P. (2015). The Journal of Economic Asymmetries The impact of FDI on economic growth in Eurozone countries. The Journal of Economic Asymmetries, 12(2), 124–132. https://doi.org/10.1016/j.jeca.2015.05.001
17. Wan, J. (2013). The contribution of foreign direct investment to clean energy use , carbon emissions and economic growth. Energy Policy, 55, 483–489. https://doi.org/10.1016/j.enpol.2012.12.039
18. Xu, Z. (1996). On the Causality between Export Growth and GDP Growth : An Empirical Reinvestigation. 4(2), 172–184.
19. Yang, B., & Yang, B. (2008). FDI and growth : a varying relationship across
20. regions and over time FDI and growth : a varying relation- ship across regions and over time. (November 2014), 37–41. https://doi.org/10.1080/13504850600749081

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Table 2: Stationarity Test for Sample

Countries	Variables	Panel (A) Original Series				Panel (B) D-Log Series Integration I (I)				Countries	Variables	Panel (A) Original Series				Panel (B) D-Log Series Integration I (I)			
		ADF Test		Phillips-Perron Test		ADF Test		Phillips-Perron Test				ADF Test		Phillips-Perron Test		ADF Test		Phillips-Perron Test	
		t-statistics	p-value	t-statistics	p-value	t-statistics	p-value	t-statistics	p-value			t-statistics	p-value	t-statistics	p-value	t-statistics	p-value	t-statistics	p-value
Australia	Exports	-0.023	0.948	-0.822	0.942	-46063.000	0.000	-4.611	0.001	Norway	Exports	-1.944	0.610	-2.072	0.542	-5.222	0.001	-5.189	0.001
	FDI	-1.210	0.655	-2.080	0.253	-5.455	0.000	-23.090	0.000		FDI	-2.690	0.249	-3.886	0.024	-4.191	0.014	-13.740	0.000
	IPI	-1.400	0.560	-1.403	0.566	-5.070	0.000	-5.074	0.000		IPI	-3.431	0.064	-2.420	0.363	-3.982	0.019	-3.739	0.033
Canada	Exports	-0.764	0.821	-53.000	0.873	-5.944	0.000	-6.950	0.000	Poland	Exports	-1.307	0.869	-1.112	0.912	-5.354	0.001	-5.747	0.000
	FDI	-2.996	0.046	-2.370	0.156	-4.870	0.001	-9.538	0.000		FDI	-3.569	0.048	-3.495	0.057	-6.853	0.000	-15.714	0.000
	IPI	-1.542	0.500	-1.594	0.475	-3.970	0.004	-3.955	0.004		IPI	-1.434	0.832	-1.459	0.823	-4.636	0.004	-4.322	0.009
Czech Republic	Exports	0.010	0.951	0.043	0.954	-4.543	0.002	-4.525	0.002	Portugal	Exports	-2.508	0.323	-2.445	0.352	-6.099	0.000	-6.671	0.000
	FDI	-3.638	0.062	-3.570	0.090	-6.400	0.000	-21.000	0.000		FDI	-5.536	0.000	-5.536	0.000	-10.199	0.000	-17.276	0.000
	IPI	0.326	0.970	1.960	0.990	-4.940	0.001	-5.811	0.000		IPI	-2.410	0.368	-1.847	0.659	-6.936	0.000	-13.966	0.000
Denmark	Exports	-0.448	0.883	-0.440	0.889	-5913.000	0.000	-5.911	0.000	Slovak Republic	Exports	-1.978	0.585	-2.097	0.523	-4.271	0.013	-4.229	0.014
	FDI	-0.550	0.500	-0.440	0.889	-10.520	0.000	-17.700	0.001		FDI	-2.757	0.224	-2.750	0.227	-6.170	0.000	-6.166	0.000
	IPI	-1.090	0.700	-1.100	0.701	-5.320	0.000	-5.313	0.000		IPI	-2.296	0.421	-2.122	0.509	-5.915	0.000	-8.317	0.000
Finland	Exports	-2.259	0.444	-2.380	0.383	-5.376	0.001	-5.368	0.001	Spain	Exports	-2.628	0.271	-2.692	0.246	-6.204	0.000	-5.772	0.000
	FDI	-0.513	0.700	-1.200	0.601	-4.676	0.005	-21.300	0.000		FDI	-4.539	0.005	-4.532	0.005	-5.378	0.001	-16.539	0.000
	IPI	-1.413	0.839	-1.413	0.839	-5.140	0.001	-5.111	0.001		IPI	-1.863	0.651	-1.529	0.800	-3.912	0.023	-3.912	0.023
France	Exports	-2.706	0.241	-2.682	0.250	-5.656	0.000	-6.071	0.000	Sweden	Exports	-2.496	0.328	-2.475	0.338	-5.658	0.000	-5.876	0.000
	FDI	-2.753	0.224	-2.748	0.225	-6.615	0.000	-7.013	0.000		FDI	-3.123	0.117	-3.127	0.116	-6.435	0.000	-13.065	0.000
	IPI	-1.484	0.816	-1.572	0.783	-5.061	0.001	-5.029	0.002		IPI	-1.404	0.842	-1.404	0.842	-5.081	0.001	-5.039	0.001
Germany	Exports	-2.141	0.505	-2.085	0.535	-5.472	0.001	-5.588	0.000	Turkey	Exports	-2.004	0.578	-1.987	0.587	-5.097	0.001	-5.096	0.001
	FDI	-0.678	0.804	-2.055	0.565	-8.129	0.000	-12.686	0.000		FDI	-3.355	0.075	-2.225	0.461	-4.653	0.004	-6.933	0.000
	IPI	-4.011	0.018	-3.492	0.056	-6.204	0.000	-15.033	0.000		IPI	-0.605	0.972	-0.358	0.985	-5.332	0.001	-5.965	0.000
Greece	Exports	-2.489	0.331	-2.567	0.297	-5.633	0.000	-5.497	0.000	United Kingdom	Exports	-3.008	0.145	-2.548	0.305	-4.865	0.002	-4.956	0.002
	FDI	-4.598	0.004	-4.598	0.004	-10.243	0.000	-12.980	0.000		FDI	-3.695	0.036	-3.708	0.035	-7.785	0.000	-8.119	0.000
	IPI	-2.231	0.458	-1.788	0.688	-3.775	0.031	-3.751	0.033		IPI	-2.463	0.343	-2.413	0.367	-4.663	0.004	-4.787	0.003
Hungary	Exports	-2.153	0.494	-2.148	0.497	-5.066	0.002	-5.129	0.002	United States	Exports	-2.117	0.518	-2.177	0.487	-5.397	0.001	-5.537	0.000
	FDI	-3.436	0.069	-2.190	0.475	-4.475	0.008	-5.474	0.001		FDI	-4.240	0.011	-3.289	0.085	-5.701	0.000	-11.245	0.000
	IPI	-2.097	0.523	-2.220	0.459	-4.586	0.006	-4.777	0.004		IPI	-1.186	0.898	-1.398	0.844	-4.347	0.008	-4.163	0.013
Iceland	Exports	-2.902	0.187	-3.209	0.112	-5.089	0.004	-6.274	0.000	Brazil	Exports	-1.988	0.587	-2.034	0.563	-5.115	0.001	-5.118	0.001
	FDI	-0.783	0.950	-0.925	0.931	-5.788	0.001	-7.026	0.000		FDI	-2.691	0.246	-2.688	0.247	-6.364	0.000	-6.414	0.000
	IPI	-4.083	0.029	-1.457	0.808	-4.331	0.016	-4.332	0.016		IPI	-1.464	0.823	-1.861	0.653	-5.036	0.001	-5.016	0.002
Italy	Exports	-2.702	0.242	-2.702	0.242	-5.645	0.000	-5.633	0.000	Chile	Exports	-2.450	0.348	-1.608	0.763	-3.896	0.028	-3.244	0.098
	FDI	-4.456	0.006	-4.493	0.006	-8.810	0.000	-20.421	0.000		FDI	-2.961	0.163	-1.278	0.872	-4.615	0.006	-4.617	0.006
	IPI	-1.932	0.616	-1.879	0.643	-5.703	0.000	-5.750	0.000		IPI	-2.425	0.359	-1.805	0.674	-4.089	0.019	-3.795	0.033
Japan	Exports	-2.547	0.305	-2.547	0.305	-5.660	0.001	-6.132	0.000	Columbia	Exports	-2.750	0.226	-1.723	0.714	-4.179	0.016	-8.946	0.000
	FDI	-3.909	0.029	-3.907	0.029	-7.152	0.000	-10.053	0.000		FDI	-3.012	0.147	-2.972	0.157	-6.011	0.000	-6.831	0.000
	IPI	-3.133	0.124	-3.133	0.124	-5.810	0.001	-6.643	0.000		IPI	-2.021	0.565	-2.021	0.565	-4.781	0.004	-4.773	0.004
Korea Republic	Exports	-2.547	0.305	-2.547	0.305	-5.660	0.001	-6.132	0.000	Indonesia	Exports	-1.982	0.588	-2.109	0.521	-4.473	0.007	-4.488	0.006
	FDI	-3.909	0.029	-3.907	0.029	-7.152	0.000	-10.053	0.000		FDI	-2.597	0.284	-2.534	0.311	-5.689	0.000	-5.675	0.000
	IPI	-3.133	0.124	-3.133	0.124	-5.810	0.001	-6.643	0.000		IPI	-1.337	0.859	-1.663	0.744	-4.383	0.008	-4.363	0.009
Mexico	Exports	-2.601	0.282	-2.487	0.332	-5.761	0.000	-10.908	0.000	Israel	Exports	-3.056	0.136	-3.072	0.132	-5.477	0.001	-10.586	0.000
	FDI	-5.441	0.001	-5.441	0.001	-5.069	0.002	-12.469	0.000		FDI	-2.998	0.150	-2.527	0.314	-7.051	0.000	-7.056	0.000
	IPI	-2.168	0.491	-2.304	0.420	-5.329	0.001	-5.446	0.001		IPI	-2.405	0.369	-2.463	0.342	-5.866	0.000	-5.857	0.000
Netherlands	Exports	-2.136	0.508	-2.233	0.457	-5.071	0.001	-5.076	0.001	South Africa	Exports	-1.814	0.671	-1.926	0.615	-4.443	0.008	-4.393	0.009
	FDI	-3.235	0.095	-3.176	0.107	-6.316	0.000	-10.222	0.000		FDI	-4.174	0.014	-4.088	0.017	-5.904	0.000	-19.692	0.000
	IPI	-3.043	0.136	-2.918	0.170	-5.758	0.000	-10.685	0.000		IPI	-2.239	0.451	-2.113	0.517	-4.888	0.003	-5.752	0.000

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Table 3: Results of Johansen's Co-Integration Test of sample series, (IPI and FDI) and (IPI and Exports).

Johansen's Co-Integration Test						
Country	**Variable**	**Lag Length AIC**	**Max Eigen Value**	**Trace Statistic**	**Critical Value****	**P-value**
Australia	IPI-FDI	2	0.417	19.040	15.490	0.014
	IPI-Export	4	0.423	20.753	15.490	0.007
Canada	IPI-FDI	1	0.355	17.009	15.490	0.029
	IPI-Export	4	0.468	26.849	25.870	0.037
Czech Republic	IPI-FDI	1	0.319	15.024	12.320	0.017
	IPI-Export	1	0.494	20.950	20.260	0.040
Denmark	IPI-FDI	1	0.260	12.700	12.320	0.040
	IPI-Export	3	0.359	14.600	12.320	0.019
Finland	IPI-FDI	3	0.530	24.784	15.495	0.002
	IPI-Export	4	0.393	16.201	15.495	0.039
France	IPI-FDI	3	0.438	23.046	15.495	0.003
	IPI-Export	4	0.434	18.900	15.495	0.015
Germany	IPI-FDI	4	0.614	25.796	15.495	0.001
	IPI-Export	1	0.259	9.912	15.495	0.288
Greece	IPI-FDI	2	0.382	15.455	15.495	0.041
	IPI-Export	2	0.396	16.239	15.495	0.039
Hungary	IPI-FDI	1	0.495	17.448	15.495	0.025
	IPI-Export	4	0.648	23.578	15.495	0.003
Iceland	IPI-FDI	3	0.565	18.847	15.495	0.015
	IPI-Export	4	0.501	10.113	15.495	0.042
Italy	IPI-FDI	2	0.405	19.441	15.495	0.012
	IPI-Export	4	0.486	20.672	15.495	0.008
Japan	IPI-FDI	1	0.326	12.939	15.495	0.117
	IPI-Export	1	0.330	9.388	15.495	0.331
Korea Republic	IPI-FDI	1	0.326	12.939	15.495	0.117
	IPI-Export	1	0.330	9.388	15.495	0.331
Mexico	IPI-FDI	1	0.408	17.487	15.495	0.025
	IPI-Export	1	0.143	5.160	15.495	0.792
Netherlands	IPI-FDI	4	0.429	15.437	15.495	0.051
	IPI-Export	4	0.448	16.442	15.495	0.036
Norway	IPI-FDI	1	0.129	5.613	15.495	0.741
	IPI-Export	4	0.353	14.750	15.495	0.045
Poland	IPI-FDI	1	0.274	13.683	15.495	0.092
	IPI-Export	4	0.513	22.530	15.495	0.004
Portugal	IPI-FDI	1	0.268	13.394	15.495	0.101
	IPI-Export	4	0.440	15.379	15.495	0.042
Slovak Republic	IPI-FDI	1	0.322	9.953	15.495	0.284
	IPI-Export	1	0.272	7.650	15.495	0.504
Spain	IPI-FDI	1	0.301	16.014	15.495	0.042
	IPI-Export	4	0.444	17.826	15.495	0.022
Sweden	IPI-FDI	4	0.504	22.605	15.495	0.004
	IPI-Export	4	0.557	23.831	15.495	0.002
Turkey	IPI-FDI	1	0.313	15.620	15.495	0.048
	IPI-Export	4	0.332	14.462	15.495	0.041
United Kingdom	IPI-FDI	1	0.275	17.944	15.495	0.021
	IPI-Export	1	0.230	9.139	15.495	0.353
United States	IPI-FDI	4	0.413	14.019	15.495	0.042
	IPI-Export	4	0.430	15.027	15.495	0.049
Brazil	IPI-FDI	1	0.129	6.435	15.495	0.644
	IPI-Export	1	0.116	4.089	15.495	0.896
Chile	IPI-FDI	1	0.175	5.109	15.495	0.797
	IPI-Export	4	0.375	15.881	15.495	0.044
Columbia	IPI-FDI	4	0.530	18.130	15.495	0.020
	IPI-Export	3	0.521	18.445	15.495	0.017
Indonesia	IPI-FDI	4	0.499	20.568	15.495	0.008
	IPI-Export	4	0.542	20.156	15.495	0.009
Israel	IPI-FDI	4	0.955	65.867	15.495	0.000
	IPI-Export	1	0.386	13.466	15.495	0.099
South Africa	IPI-FDI	1	0.384	15.450	15.495	0.041
	IPI-Export	2	0.434	16.957	15.495	0.030

Above table gives the results of test of cointegration in which Trace test statistics and maximal Eigen value and are taken into account to construe the result. In IPI and FDI null hypothesis is rejected in 22 countries which means long term relationship, where as in other series In II and Exports null hypothesis is rejected in 23 countries again clearly divulges that one cointegration relationship occurs.

Table 4 Results of Granger Causality

Pair-wise Granger Causality Test				Pair-wise Granger Causality Test			
Country		F-Stat	Prob	Country		F-Stat	Prob
Australia	IPI does not Granger cause FDI	1.161	0.331	Norway	IPI does not Granger cause FDI	0.020	0.890
	FDI does not Granger cause IPI	3.175	0.041		FDI does not Granger cause IPI	0.670	0.419
	IPI does not Granger cause Export	1.270	0.260		IPI does not Granger cause Export	0.736	0.397
	Export does not Granger cause IPI	2.980	0.009		Export does not Granger cause IPI	4.619	0.040
Canada	IPI does not Granger cause FDI	3.982	0.036	Poland	IPI does not Granger cause FDI	2.769	0.107
	FDI does not Granger cause IPI	8.093	0.008		FDI does not Granger cause IPI	0.742	0.396
	IPI does not Granger cause Export	0.817	0.500		IPI does not Granger cause Export	11.629	0.002
	Export does not Granger cause IPI	2.800	0.030		Export does not Granger cause IPI	1.198	0.282
Czech Republic	IPI does not Granger cause FDI	6.320	0.020	Portugal	IPI does not Granger cause FDI	0.214	0.647
	FDI does not Granger cause IPI	0.014	0.900		FDI does not Granger cause IPI	2.555	0.120
	IPI does not Granger cause Export	5.010	0.036		IPI does not Granger cause Export	0.141	0.710
	Export does not Granger cause IPI	0.752	0.390		Export does not Granger cause IPI	9.254	0.005
Denmark	IPI does not Granger cause FDI	4.010	0.024	Slovak Republic	IPI does not Granger cause FDI	1.168	0.292
	FDI does not Granger cause IPI	0.547	0.580		FDI does not Granger cause IPI	0.941	0.343
	IPI does not Granger cause Export	1.160	0.320		IPI does not Granger cause Export	0.141	0.711
	Export does not Granger cause IPI	2.800	0.030		Export does not Granger cause IPI	0.512	0.482
Finland	IPI does not Granger cause FDI	7.531	0.010	Spain	IPI does not Granger cause FDI	5.783	0.022
	FDI does not Granger cause IPI	0.542	0.467		FDI does not Granger cause IPI	19.804	0.000
	IPI does not Granger cause Export	5.122	0.031		IPI does not Granger cause Export	1.192	0.283
	Export does not Granger cause IPI	4.239	0.048		Export does not Granger cause IPI	3.257	0.041
France	IPI does not Granger cause FDI	8.905	0.006	Sweden	IPI does not Granger cause FDI	3.196	0.046
	FDI does not Granger cause IPI	1.454	0.237		FDI does not Granger cause IPI	0.395	0.677
	IPI does not Granger cause Export	0.763	0.476		IPI does not Granger cause Export	1.886	0.170
	Export does not Granger cause IPI	6.988	0.004		Export does not Granger cause IPI	5.174	0.012
Germany	IPI does not Granger cause FDI	3.953	0.046	Turkey	IPI does not Granger cause FDI	3.563	0.042
	FDI does not Granger cause IPI	1.027	0.319		FDI does not Granger cause IPI	1.104	0.346
	IPI does not Granger cause Export	0.207	0.652		IPI does not Granger cause Export	1.677	0.205
	Export does not Granger cause IPI	1.675	0.205		Export does not Granger cause IPI	3.950	0.031
Greece	IPI does not Granger cause FDI	0.675	0.575	United Kingdom	IPI does not Granger cause FDI	5.129	0.031
	FDI does not Granger cause IPI	3.547	0.029		FDI does not Granger cause IPI	1.042	0.315
	IPI does not Granger cause Export	0.335	0.567		IPI does not Granger cause Export	0.145	0.706
	Export does not Granger cause IPI	7.631	0.010		Export does not Granger cause IPI	0.012	0.912
Hungary	IPI does not Granger cause FDI	0.004	0.948	United States	IPI does not Granger cause FDI	7.051	0.012
	FDI does not Granger cause IPI	9.701	0.005		FDI does not Granger cause IPI	3.146	0.086
	IPI does not Granger cause Export	7.495	0.012		IPI does not Granger cause Export	0.145	0.866
	Export does not Granger cause IPI	2.739	0.112		Export does not Granger cause IPI	4.543	0.020
Iceland	IPI does not Granger cause FDI	2.137	0.159	Brazil	IPI does not Granger cause FDI	2.352	0.135
	FDI does not Granger cause IPI	3.601	0.044		FDI does not Granger cause IPI	0.602	0.444
	IPI does not Granger cause Export	0.141	0.712		IPI does not Granger cause Export	0.698	0.410
	Export does not Granger cause IPI	6.029	0.026		Export does not Granger cause IPI	0.002	0.961
Italy	IPI does not Granger cause FDI	2.235	0.109	Chile	IPI does not Granger cause FDI	0.635	0.433
	FDI does not Granger cause IPI	13.147	0.000		FDI does not Granger cause IPI	1.247	0.275
	IPI does not Granger cause Export	0.004	0.949		IPI does not Granger cause Export	3.213	0.061
	Export does not Granger cause IPI	6.003	0.020		Export does not Granger cause IPI	3.559	0.047
Japan	IPI does not Granger cause FDI	0.053	0.821	Columbia	IPI does not Granger cause FDI	8.811	0.007
	FDI does not Granger cause IPI	1.061	0.316		FDI does not Granger cause IPI	0.233	0.634
	IPI does not Granger cause Export	2.663	0.119		IPI does not Granger cause Export	3.842	0.041
	Export does not Granger cause IPI	1.508	0.234		Export does not Granger cause IPI	0.217	0.646
Korea Republic	IPI does not Granger cause FDI	0.053	0.821	Indonesia	IPI does not Granger cause FDI	3.424	0.045
	FDI does not Granger cause IPI	1.061	0.316		FDI does not Granger cause IPI	1.276	0.268
	IPI does not Granger cause Export	2.663	0.119		IPI does not Granger cause Export	0.636	0.432
	Export does not Granger cause IPI	1.508	0.234		Export does not Granger cause IPI	3.149	0.047
Mexico	IPI does not Granger cause FDI	12.680	0.000	Israel	IPI does not Granger cause FDI	4.887	0.036
	FDI does not Granger cause IPI	0.429	0.655		FDI does not Granger cause IPI	0.011	0.918
	IPI does not Granger cause Export	1.186	0.285		IPI does not Granger cause Export	1.885	0.182
	Export does not Granger cause IPI	0.082	0.777		Export does not Granger cause IPI	0.796	0.381
Netherlands	IPI does not Granger cause FDI	1.005	0.379	South Africa	IPI does not Granger cause FDI	11.651	0.002
	FDI does not Granger cause IPI	9.499	0.001		FDI does not Granger cause IPI	1.586	0.220
	IPI does not Granger cause Export	3.742	0.043		IPI does not Granger cause Export	2.580	0.044
	Export does not Granger cause IPI	0.161	0.691		Export does not Granger cause IPI	0.076	0.972