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Foreign Direct Investment, Growth of Output Indicators and Economic Growth in China: Empirical Evidence on Causal Links

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ABSTRACT

This paper examines the causality between foreign direct investment (FDI), growth of output indicators and gross domestic product (GDP) in China between 1995 and 2016 using Granger causality test based on the vector error correction model. In contemporary times, attention has been drifted from overall FDI as engine of growth in the analysis of economic growth to sectoral composition of the economy. This paper considers the growth of output indicators (manufacturing, service and agricultural sectors) as engines of growth. The results indicate a bidirectional causal link between GDP and FDI in the long and short runs. There was however a uni-directional relation between GDP and manufacturing and service sectors in the long run. A short run causal link exists between GDP and manufacturing but not for service. The study does not confirm causality to run from GDP to agriculture.

Keywords: Foreign Direct Investment, Economic Growth, Vector Error Correction Model Causality
JEL Classifications: F21, F43

1. INTRODUCTION

The 21st century marks an era of internationalization or globalization. That is an era where many countries have opened up and are still opening up their economies to the influx of foreign direct investments (FDI)[1]. Multinational companies (MNCs)[2] have taken advantage of this trade liberalization window to invest abroad, thereby expanding their horizon in terms of production, increasing their market shares and profitability and indeed promoting economic growth in the host country. The motivation for MNCs to invest abroad is the fact that some foreign countries are naturally endowed with factor resources and the existence of potentially untapped market opportunities. That is the movement of MNCs from developed to developing countries. There is no doubt that FDI in host countries does promote the development of new methods to production, improvement in the economy, employment opportunities, technology and so on. According to the world investment report 2017 of United Nations Conference on Trade and Development (UNCTAD), the total flow of FDI in the whole world for the year 2016 was US$1.75 trillion, (UNCTAD, 2017) as compared to that of UD$633 billion in 1995, (UNCTAD, 1996). This clearly shows that the amount of FDI flows in the world increased more than double over the years indicating the relevance of FDI to economic growth.

Notwithstanding the increase in world FDI flows, there are however several authors with diverging views as the relevance of FDI to economic growth. The likes of (Alkhasawneh, 2013); Batten and Xuân (2006); Carp (2013) agree that there is a strongly positive relationship between FDI and growth in countries that exhibit higher levels of human capital, smaller population size, technological advancement, financial markets and encourages trade liberalization. According to Alfaro (2003), Herzer and Klasen (2008) and Seyoum et al. (2015) there is an unclear effect

1 FDI is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate) (UNCTAD, 2007a).

2 MNC can be defined as an enterprise that engages in FDI and which owns or, to ascertain extent, controls value-added activities in several countries, (Dunning and Lundan, 2008).

of FDI on economic growth. Their findings revealed that FDI had a mixed effect on country sectorial growth. While the primary sector showcased a positive effect, the secondary or manufacturing was negative and that of the service sector was uncertain. On the contrary, Pandya and Sisombat (2017), Curwin and Mahutga (2014) and (Karimi and Yusop, 2009) seemingly have revealed that there is a negative of FDI on economic growth.

In 1978, Deng Xiaoping a reformist leading the communist party of China adopted and implemented "reform and opening up" policy. This marked the turning point in the reformation of the Chinese economy. The implementation of this policy accounted for a more individualistic agricultural practices, opening up to foreign investment, motivation for private entrepreneurship and privatization of the economy, relaxing of price control systems etc., (Engardio, 2005). The successful implementation and continuous modification of the policy to meet current dynamic needs of the country makes China among the richest and robust economies and the third largest recipient of FDI in the world after United States and United Kingdom, (UNCTAD, 2017).

The rapid transformation of the Chinese economy has received a major boost from FDI since the "reform and opening up" policy was implemented (Graham and Wada, 2001). The "resource seeker" and "market seeker" foreign investors could capitalize on the huge population base of China to enjoy cheap labour and a growing customer base. There is a growing demand for consumer goods as a result of the existence of huge a middle-income class. This gives rise to an influx of many investors into China. The domestic market of China has experienced a fast-growing inflow of FDI particularly from Europe, North America and Japan (Parashar, 2015). There has been a 4.1% year on year to about 813 billion yuan ($118 billion) in 2016. A Sino-foreign equity joint venture, Sino-foreign cooperative joint venture and a Wholly Foreign-owned Enterprise are the main forms of FDI practiced in China (Na, 2004).

With the ongoing debate by researchers regarding whether FDI influences economic growth or not gives rise for this present paper. We intend to investigate the causality between FDI, growth of output indicators and economic growth in china, using a panel time-series technique of co-integration and Granger causality based on the vector error correction model (VECM).

The remainder of the paper is organised as follows: Section 2 overview of Chinese FDI and economic growth, section 3 review of the literature, section 4 the empirical analysis of data and the econometric results, section 5 outlines the main conclusions and policy implications of our research.

2. REVIEW OF LITERATURE

As stated earlier, the whole FDI syndicate revolves round the transfer to of skilled labour, technology, financial capital etc. from the investing to the host countries. This process of transfer of elements between or among countries involves either costs or benefits to the countries. This however breeds the grounds for many scholars to have diverging views as to whether FDI is beneficial to the host countries or not. For example, according to Yarui and David, (2013) in their research which aimed at examining the causal structure between FDI and economic growth using the directed acyclic graph approach. Three outcomes were realized; first was the fact in developing countries, economic growth leads to FDI inflows; second, trade is a mediating influence on FDI and other factors and third, stock market also has a mediating impact on the FDI and causal variables in developed countries. Furthermore, based on empirical findings drawn from the Johansen cointegration analysis Alkhasawneh (2013) suggested that FDI influences gross domestic product (GDP) in the long run equilibrium. It was again revealed that there was a bidirectional influence on FDI and GDP relationship suggesting that foreign capital strongly impacts economic growth. In addition, in attempt to investigate the causality between FDI and Growth of the BRICS countries, Sridharan (2009) employed Industrial Production Index (IPI) as a measure of Economic Growth. They found out that there is a bi-directional relationship between GDP and FDI for Brazil, Russia and South Africa and while there exists a uni-directional relationship between FDI and Growth for India and China respectively.

Nabila (2011) in their empirical research on the relationship between FDI and economic growth using heterogeneous panel for the period 1983–2008, the results reveal that FDI and economic growth are positively related. That is, panel homogeneous causality hypothesis shows the existence of bi-directional causality between FDI and economic growth while the results of panel homogeneous non-causality hypothesis confirm the existence of unidirectional causality running from FDI to economic growth in selected panel. To add, Gursoy et al. (2013) in a research FDI and Economic Growth Relationship Based on Cross-Country Comparison, the findings reveal that FDI and Economic Growth variables are cointegrated for Azerbaijan and Turkmenistan. The Granger causality test also indicated that FDI causes GDP for Azerbaijan and bidirectional causality is observed for Turkmenistan.

On the contrary, some authors have the opinion that FDI negatively affects the GDP. This can be seen in the works of Ludoșean (2012) where analysis of vector autoregressive (VAR) analysis was conducted to identify the relationship between FDI and economic growth in Romania between 1991 and 2009. The results show that FDI does not influence growth in Romania. According to a study by Durham (2004), to examine the effects of FDI and equity foreign portfolio investment on economic growth covering the period between 1979 and 1998 on 80 countries. The results indicate that there is no positive effect of FDI on economic growth. Despite the above findings, an empirical analysis based on the hierarchical multiple regressions is conducted to find out the momentum of the Malaysia economic growth. The results shows that there is an insufficient combination between technological spill overs of FDI inflows in Malaysia and therefore does not lead to economic growth (Fadhil and Almsafir, 2015).

In conclusion, it can be noticed from the varying findings above that there exists a general disagreement based on the presence of diverging opinions pros and cons on FDI being an influencing factor on economic growth.

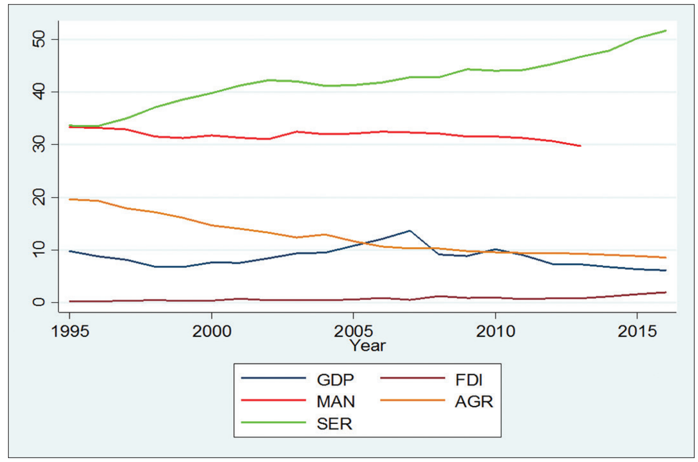
3. OVERVIEW OF CHINESE FDI AND ECONOMIC GROWTH

The economy of the People's Republic of China started to experience a U-turn in the late 1970's and early 1980's when the then reformist and CPC chairman Deng Xiaoping put into action the "reform and opening up" policy. By adopting this policy meant ensuring private ownership of lands for agricultural purposes, privation of some state owned enterprise, adoption of the bottom-top approach, expansion of price flexibility, creation of special economy zones (SEZ)[3], individual ownership and operation of businesses, expansion of the service sector and state owned enterprises allowed to produce above planned quotas and determination of price by the force of demand and supply, (Brandt and Rawski, 2008; Chung-Tong, 1985). This eventually led to the drift away from the practice of a planned or controlled economy to a mixed economy. It is therefore not surprising that the economy of the People's Republic of China is robust and resilient. In order to attract more foreign investors, many more cities and provinces were made SEZ's which intend introduced very attractive tax and business incentives. The result is evident today. China is now the third largest recipient of FDI in the world, (UNCTAD, 2017).

The early part of the 1990's recorded steady increasing amounts of foreign investments into China with corresponding increases in the service sector. FDI flow and services value added as a percentage of GDP were only 4.33% and 35.5% respectively on average for the period of 1995–2005. The FDI inflow and services value in china shot up massively after 2005. This would be because the government policies were geared towards the creation of more SEZ's which were autonomous and free from government restrictions, reduced tariffs and trade barriers. Again, it was during this period that China became a member of the World Trade Organization. Currently, the FDI inflow and services value added as percentage of GDP is about 19.4% and 52% respectively (Figure 1). It could also be said that the tremendous growth rate of FDI inflow and services value added to GDP could be attributed to relative political and social stability. Despite the tremendous increase in the percentages of FDI inflows and services value added to GDP after the reform and open up policy was introduced; the Chinese economy experienced a decline in the manufacturing sector with a corresponding fall in GDP growth rate in the 1990's (Figure 1). Between 2000 and 2007 the Chinese economy however, experienced an increase in the manufacturing sector output which reflected in an increase in GDP growth rates (Figure 1). The increase in the growth rates could be attributed to policies implemented to ensure a rise in capital formation, increase in total factor productivity and high quality human capital. Although the Chinese economy was experiencing increasing growth rates during the early 2000's, the economy was susceptible to external shocks. The aftermath of the 2008 United States' financial crisis which affected other parts of the world resulted to an economic meltdown of China's growth rate. That is,

3 These were selected regions that were given the right to engage in foreign investment. They were relatively free of any state interference in involving both domestic firms and foreign investors in doing business. These regions could give tax and business incentives as a way of motivating foreign investors, (Chung-Tong, 1985).

Figure 1: Gross domestic product, foreign direct investments inflow and growth of output indicators in China



Source: World development idicators (2016)

after 2007 the manufacturing sector and GDP growth rates began to dwindle down (Figure 1). The agriculture sector witnessed a continuous decline with regards to its percentage to GDP. This is so because the government policies were aimed at moving China from an agricultural depended country to a service value adding economy. Figure 2 gives a clearer view of the GDP, FDI inflow and growth of output indicators in China.

4. DATA AND METHODOLOGY

4.1. Data

This section examines the relationship between FDI, economic growth and productivity growth in China. Admittedly, in other to give a better understanding to economic growth, the empirical methodology adapted in this section will provide any definitive inclusion of other variables that are considered as engine of growth that have potential benefits of FDI upon economic growth. These variables otherwise referred to as the growth of output indicators are manufacturing, agriculture and service sectors. For the purpose of this paper, FDI is measured as a ratio of FDI inflows to GDP. The inclusion of manufacturing depicts the proportion of added value of manufacturing output to GDP, (Szirmai and Verspagen, 2015). Services denotes the added value of the service industry to GDP, (Pazienza, 2015a). Agriculture represents the share of the added value of agriculture to GDP, (Pazienza, 2014; 2015b). Our dependent variable economic growth is represented by GDP per capita growth. A time series dataset between 1995 and 2016 was used which was derived from the World Bank (World Development Indicators).

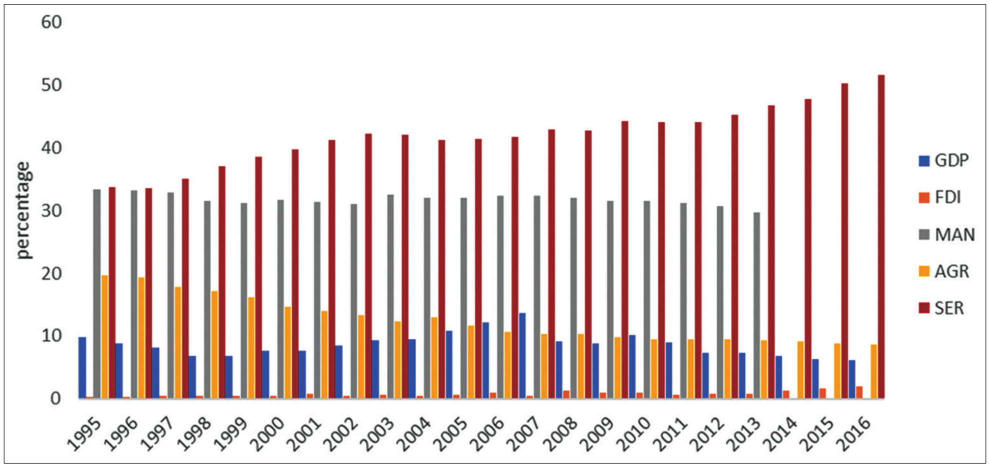
4.2. Unit Root Test

The augmented Dickey–Fuller regression analysis is undertaken to better understand the stationarity elements. To compute the test statistics, we fit the augmented Dickey–Fuller regression.

$$\Delta Y_t=\alpha+\beta Y_{t-1}+\rho t+\sum_{t=1}^{k-1}\delta_t \Delta Y_{t-1}+\varepsilon_t \tag{1}$$

H_a=There exist unit root,
H_1=There is no unit root.

Figure 2: Gross domestic product, foreign direct investments inflow and growth of output indicators in China



Source: World development idicators (2016)

Where α is the constant and ρ is the coefficient of time trend. Y represents the variables under consideration. These include log (GDP), log (FDI), log (MAN), log (AGR), log (SER) and. Δ depicts first-difference of a variable; t is a time trend; and ε is an error term. Unit root analysis is conducted on the coefficient of Y_{t-1} in the above regression. If the coefficient, β, is $\beta \neq 0$, then the null hypothesis is rejected, meaning the variable Y contains no unit root problem. The optimal lag length is also determined in the augmented Dickey-Fuller (ADF) regression and is selected using Akaike information criterion (AIC).

4.3. Johansen Cointegration Test

The Johansen maximum likelihood cointegration test is used because it is more generally applicable and so permits more than one cointegrating relationships. It therefore allows long-run relationships among the variables to be examined. The Granger causality analysis will be used to check for causality while optimal lag length is settled on to ensure best outcomes. Generally, most empirical applications analyse multivariate systems, therefore our consideration will be in line with that. Consider a VAR with p lags:

$$Y_t = A_t Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \beta X_t + \varepsilon_t \quad (2)$$

Where, Y_t denotes a vector of endogenous variables and A the autoregressive matrices. X_t depicts the deterministic vector while β stands for the parameter matrices. However, ε_t represents the vector of innovations and p is the lag length. Any VAR(p) can be rewritten as a VECM. Therefore, VAR can be re-written in a VECM form as:

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-1} + {}^2 X_t + \mu_t \quad (3)$$

Where, $\Pi + \sum_{i=1}^{p} A_i$ and $\Gamma_i = -\sum_{j=i+1}^{p} A_j$. The matrix Π contains the information regarding the long-run coefficients of the Y_t variables in the vector. If all the endogenous variables in Y_t are cointegrated at order one, the cointegrating rank, r, is given by the rank of $\Pi = \alpha\beta'$, where the elements of α are known as the corresponding adjustment of coefficient in the VEC model and β represents the matrix of parameters of the cointegrating vector. To indicate the number of cointegrating rank, two likelihood ratio test statistics, namely the trace and the maximum Eigen value tests (Johansen, 1988), are used to determine the number of cointegrating vectors. The two tests are defined as:

$\lambda_{trace} = -T\sum_{j=r+1}^{k} \log(1-\lambda_i)$ and $\lambda_{max} = -T\log(1-\lambda_{i+1})$, where λ_i denotes the estimated values of the characteristic roots obtained from the estimated Π, and T is the number of observations. The first statistic test tests H_0 that the number of cointegrating vector is less than or equal to r against the alternative hypothesis of k cointegrating relations, where k is the number of endogenous variables, for r = 0, 1,…, k−1. The alternative of k cointegrating relations corresponds to the case where none of the series has a unit root. The second test tests the null that the number of cointegrating vectors is r, against the alternative hypothesis of 1 + r cointegrating vectors.

4.4. Granger Causality Based on the VECM

As stated earlier, the Johansen maximum likelihood allows long-run relationships among the variables to be examined which therefore paves the way for the Granger causality analysis to be performed since the Johansen test is silent on the causality indications. The establishment of long-run and short-run relationship is done if the variables are cointegrated with Granger causality analysis based on the VECM, (Granger, 1987). They however take the following forms:

Model 1: Y=[log(GDP), log(FDI)]

$$\Delta\log(GDP)_t = \beta_{1,t} + \sum_{j=1}^{n-1} \beta_{11,j} \Delta og(GDP)_{t-1} + \sum_{j=1}^{n-1} \beta_{12,j} \Delta\log(FDI)_{t-j} + \theta_1 EC_{t-1} + \varepsilon_{1t} \quad (4)$$

$$\Delta\log(FDI)_t = \beta_{2,t} + \sum_{j=1}^{n-1} \beta_{21,j} \Delta\log(FDI)_{t-j} + \sum_{j=1}^{n-1} \beta_{22,j} \Delta\log(GDP)_{t-1} + \theta_2 EC_{t-1} + \varepsilon_{2t} \quad (5)$$

Model 2: Y=[log(GDP), log(MAN)]

$$\Delta\log\left(GDP\right)_t=\rho_{1,t}+\sum_{j=1}^{n-1}\rho_{11,j}\Delta\log(GDP)_{t-1}+\sum_{j=1}^{n-1}\rho_{12,j}\Delta\log(MAN)_{t-j}+\phi_1 EC_{t-1}+\eta_{1t} \quad (6)$$

$$\Delta\log\left(MAN\right)_t=\rho_{2,t}+\sum_{j=1}^{n-1}\rho_{21,j}\Delta\log(MAN)_{t-1}+\sum_{j=1}^{n-1}\rho_{22,j}\Delta\log(GDP)_{t-j}+\phi_2 EC_{t-1}+\mu_{2t} \quad (7)$$

Model 3: Y=[log(GDP), log(AGR)]

$$\Delta\log\left(GDP\right)_t=\zeta_{1,t}+\sum_{j=1}^{n-1}\zeta_{11,j}\Delta\log(GDP)_{t-1}+\sum_{j=1}^{n-1}\zeta_{12,j}\Delta\log(AGR)_{t-j}+\psi_1 EC_{t-1}+\xi_{1t} \quad (8)$$

$$\Delta\log\left(AGR\right)_t=\zeta_{2,t}+\sum_{j=1}^{n-1}\zeta_{21,j}\Delta\log(AGR)_{t-1}+\sum_{j=1}^{n-1}\zeta_{22,j}\Delta\log(GDP)_{t-j}+\psi_2 EC_{t-1}+\xi_{2t} \quad (9)$$

Model 4: Y=[log(GDP), log(SER)]

$$\Delta\log\left(GDP\right)_t=\gamma_{1,t}+\sum_{j=1}^{n-1}\gamma_{11,j}\Delta\log(GDP)_{t-1}+\sum_{j=1}^{n-1}\gamma_{12,j}\Delta\log(SER)_{t-j}+\varphi_1 EC_{t-1}+\mu_{1t} \quad (10)$$

$$\Delta\log\left(SER\right)_t=\gamma_{2,t}+\sum_{j=1}^{n-1}\gamma_{21,j}\Delta\log(SER)_{t-1}+\sum_{j=1}^{n-1}\gamma_{22,j}\Delta\log(GDP)_{t-j}+\varphi_2 EC_{t-1}+\mu_{2t} \quad (11)$$

Where log(GDP), log(FDI), log(MAN), log(AGR), and log(SER), represent the natural logarithms of real GDP per capita growth, FDI, the proportion of added value of manufacturing output to GDP, the share of added value of agricultural output to GDP and the proportion of added value of service to GDP respectively. Our main focus is on Model 1. The coefficients of the EC_{t-1} term indicate causality in the long run and the joint F test of the coefficients of the first-differenced independent variables confirms short-run causality. Δ denotes first-difference of the variable. ε_{1t} and ε_{2t} are the stationary error terms for equations (4) and (5), respectively. n is the order of the VAR, which is translated into lag of n−1 in the error correction mechanism. θ_1 and θ_2 denote the coefficients of long-run Granger causality for equations (4) and (5), respectively. In Equation (4), the coefficients of lagged value $\beta_{12,j}$ for j = 1,… n−1 represent short-run effects of FDI inflows on GDP. In Equation (5), the coefficients of lagged value $\beta_{22,j}$ for j = 1,… n-1 represent short-run effects of GDP on FDI. In Model 2, ϕ_1 and ϕ_2 denote the coefficients of long-run Granger causality for equations (6) and (7), respectively. In Equation (6), the coefficients of lagged value $\rho_{12,j}$ for j = 1,… n−1 represent short-run effects of manufacturing on GDP. In Equation (7), the coefficients of lagged value $\rho_{22,j}$ for j = 1,… n−1 represent short-run effects of GDP on manufacturing. η_{1t} and η_{2t} are the stationary error terms for equations (6) and (7), respectively. In Model 3, ψ_1 and ψ_2 denote the coefficients of long-run Granger causality for Equations (8) and (9) respectively. In equation (8), the coefficients of lagged value $\zeta_{12,j}$ for j = 1,… n−1 represent short-run effects of agricultural output on GDP. In Equation (9), the coefficients of lagged value $\zeta_{22,j}$ for j = 1,… n−1 represent short-run effects of GDP on agricultural output. ξ_{1t} and ξ_{2t} are the stationary error terms for equations (8) and (9), respectively. In Model 4, φ_1 and φ_2 denote the coefficients of long-run Granger causality for Equations (10) and (11) respectively. In Equation (10), the coefficients of lagged value $\gamma_{12,j}$ for j = 1,… n−1 represent short-run effects of service on GDP. In equation (11), the coefficients of lagged value $\gamma_{22,j}$ for j = 1,… n−1 represent short-run effects of GDP on services. μ_{1t} and μ_{2t} are the stationary error terms for equations (10) and (11), respectively. Granger causality analysis based on VECM is used to determine the short-run causality in our work.

5. EMPIRICAL RESULTS AND DISCUSSIONS

This section involves the empirical findings from ADF test analysing the stationarity of the variables, Johansen cointegration test for cointegration between the variables, and lastly but not the least the Granger causality test based on the vector error correction mechanism are presented.

The results of standard ADF test are presented in Table 1. The test results show that all the data are found to be nonstationary at level, I(0). After first differencing, the null hypothesis (H0) for the existence of a unit root in the five variables is rejected, implying that the five variables used in the study are integrated at order one, I(1). The findings confirm that the Johansen cointegration mechanism is an appropriate technique used to check whether the variables are cointegrated.

Table 2 shows results of the bivariate Johansen co-integration tests. Before we proceed, the AIC and SBIC tests statistics were implored to determine the optimum lag structure for the model. The results from Table 2 indicates that for all the five models, the trace tests and the maximum eigenvalue tests values are greater than the critical values at 0 cointegration but are less at 1 cointegration. Meaning there is one cointegrate model on the system. Both trace test and eigenvalue test values suggests the null hypothesis of no co-integration (r=0) we fail to accept while the alternate hypothesis of existence of co-integration (r=1) is accepted. The presence of cointegration exhibits a long-run equilibrium relationship among the variables. That is between FDI and GDP, MAN and GDP, AGR and GDP and SER and GDP for the period 1995–2016.

Table 1: Augmented Dickey–Fuller test

Augmented Dickey–Fuller test		
Series	**Level**	**First difference**
Log (GDP)	−1.172	−3.916
log (FDI)	−0.256	−4.584
log (MAN)	−0.956	−3.732
log (AGR)	−1.953	−4.445
log (SER)	−0.646	−2.942

Tables 3 and 4 presents the outcome of the Granger causality test by applying VECM and VAR model for long-run and short-run relationships. It is realised that GDP has Granger causality with FDI, MAN and SER. The empirical findings in Model 1 indicates a bi-directional causality between GDP and FDI with a negative and statistically significant long-run coefficient, EC_{t-1}, for both GDP and FDI at 5 per cent level ($P < 0.05$). Furthermore, there is a short run causal relationship between GDP and FDI. The findings imply that the Chinese economic growth is greatly influenced by the inflow of FDI in the long run. However, polices to boost inflow of FDI must account for the long-run negative effects it might have on the economy. In summary, the findings affirm a broader significant influence of economic development on the Chinese economy. The empirical findings of this paper are consistent with Irandoust (2016), Abbeset al. (2015), (Szkorupová, 2014), Ozturk and Acarvci (2010), Acaravci and Ozturk (2012), Gungor and Ringim (2017), and Yarui and David (2013), providing evidence that FDI Granger-cause economic growth in their respective countries under investigation. On the contrary, Dritsakis and Stamatiou (2014), Adi and Adimani (2014), Asheghian (2016) and Frimpong and Oteng-Abayie (2006) have diverging views that FDI does not Granger-cause economic growth. In addition, the empirical findings in Model 2 and 5 indicates a uni-directional causality between GDP and MAN and GDP and SER respectively. Both models have negative and statistically significant long-run coefficients, EC(t-1), for GDP equation at 5% level ($P < 0.05$) whereas MAN and SER equations are not significant. It is however realised that there is a short run causal relationship between GDP and MAN but none for GDP and SER. The findings indicate that both MAN and SER are influenced by GDP in the long run. Meaning a booming economy will have a rippling effect on MAN in terms of increase in employment, higher outputs and productivity, reduced costs due to competition etc and that of SER will be seen in the form of quality service improvements, increased variety of services available, employment and knowledge spill overs, (Alfaro, 2003; UNCTAD, 2007b). However, GDP does not Granger-cause AGR neither does AGR granger-cause GDP.

Table 2: Johansen's cointegration test

Johansen's Cointegration test for long-run equilibrium relationship between log (FDI), log (MAN), log (SER), log (AGR) and Chinese economic growth, 1995–2016					
Null (H_0)	**Alt: (H_1)**	**λ_{trace}**	**95% CV**	**λ_{max}**	**95% CV**
Model 1: Y=[log (GDP), log (FDI)]					
r=0	r≥1	19.6700	15.41	18.2426	14.07
r≤1	r≥2	1.4273*	3.76	1.4273*	3.76
Model 2: Y=[log (GDP), log (MAN)]					
r=0	r≥1	56.5811	15.41	56.2233	14.07
r≤1	r≥2	0.3578*	3.76	0.3578	3.76
Model 3: Y=[log (GDP), log (AGR)]					
r=0	r≥1	19.2264	15.41	17.1090	14.07
r≤1	r≥2	2.1175*	3.76	2.1175	3.76
Model 4: Y=[log (GDP), log (SER)]					
r=0	r≥1	20.3845	15.41	20.3420	14.07
r≤1	r≥2	0.0425*	3.76	0.0425	3.76

*Shows the first order difference. The number of lags chosen is based on maximum AIC and SBIC for the five models

6. CONCLUSION AND POLICY IMPLICATIONS

This paper aimed at examining the causal link between FDI, AGR, MAN, SER and GDP in China for the period 1995–2016. Researchers in recent times have shifted from the analysis of FDI as engine of growth in an economy to the sectoral composition of the economy. For the purpose of the paper, the manufacturing, service and agricultural sectors were considered as engines of growth. The late 1970's marked a turning point for the Chinese economy through the implementation of the "reform and opening up" policy. This policy led to the removal of bottlenecks, inefficiencies and opening up to foreign trade.

The outcome of the findings from the VECM causality analysis revealed that there is a bidirectional causal link between GDP and FDI in the long run. Likewise, there is a short run causal relationship between GDP and FDI. Shifting our attention to the other variables considered as engines of growth, we found out that there was a unidirectional causality from GDP to both MAN and SER. The findings also showed that a short run causal link exists between GDP and MAN while there was none for GDP and SER. Fascinatingly, we did not find any causality among GDP and AGR. In summary, our findings propose (i) a complementary relationship between GDP and FDI in the Chinese economy, (ii) based on the complementary link among GDP and FDI, there is a spill over

Table 3: Granger causality Wald tests

Causality test on the causal relation between log (FDI), log (MAN), log (AGR), log (SER) and log (GDP) for the period 1995–2016			
Dependent variables	**Short run relationship**		**Long run relationship**
Model 1: Y=[log (GDP), log (FDI)]	**Δlog (GDP)**	**Δlog (FDI)**	**EC_{t-1}**
Δlog (GDP)		0.138	−5.971177*
Δlog (FDI)	0.740		−3.295605*
Model 2: Y=[log (GDP), log (MAN)]	**Δlog (GDP)**	**Δlog (MAN)**	**EC_{t-1}**
Δlog (GDP)	-	0.112	−2.537976*
Δlog (MAN)	0.0000	-	17.04782
Model 3: Y=[log (GDP), log (AGR)]	**Δlog (GDP)**	**Δlog (AGR)**	**EC_{t-1}**
Δlog (GDP)	-	0.426	−0.0700818
Δlog (AGR)	0.375	-	−0.2772695
Model 4: Y=[log (GDP), log (SER)]	**Δlog (GDP)**	**Δlog (SER)**	**EC_{t-1}**
Δlog (GDP)	-	0.431	−0.1547652*
Δlog (SER)	0.894	-	−0.7680905

Table 4: Granger causality relationship

Causal relationship		
GDP	↔	FDI
GDP	→	MAN
GDP	N/A	AGR
GDP	→	SER

effect from GDP to manufacturing output to services output and (iii) a unidirectional link between GDP and both MAN and SER.

Based on the findings of this paper, the following policy implications could be recommended. FDI helps in the economic development of China. It is realised that FDI is a necessary and therefore an important component in the growth of the Chinese economy. It is however, imperative for policy makers to put in place friendly and motivating FDI policies to attract inflows into the country but at the same time should be mindful of the negative impact of FDI. In addition, it is realised that China exhibits greater prospects of economic growth which in itself plays a very important role in attracting FDI into the country which invariably has a positive trickle-down effect on promoting manufacturing and service outputs. This might be because of the huge and quick market demand for consumer goods from the fast-growing middle-income class earners and most likely because of the availability of cheap labour. The government therefore is recommended to provide infrastructural development policies that are aimed at ensuring favourable business environment to improve the existing manufacturing and production capacity and thus higher service outputs. Also, its recommended that policy measures should be focused on promoting the development of human capital so as to help increase efficiency and productivity.

REFERENCES

Abbes, S.M., Mostéfa, B., Seghir, G., Zakarya, G.Y. (2015), Causal interactions between FDI, and economic growth: Evidence from dynamic panel co-integration. Procedia Economics and Finance, 23, 276-290.

Acaravci, A., Ozturk, I. (2012), Foreign direct investment, export and economic growth: Empirical evidence from new EU countries. Romanian Journal of Economic Forecasting, 2, 52-67.

Adi, A., Adimani, W. (2014), Effect of foreign direct investment on China economic growth: A granger causality approach. IOSR Journal of Economics and Finance, 3, 2321-5933.

Alfaro, L. (2003), Foreign direct investment and growth: Does the sector matter. Harvard Business School, 2003, 1-31.

Alkhasawneh, M.F. (2013), The granger causality relationship between foreign direct investment (FDI) and economic development in the state of Qatar. Applied Mathematics and Information Sciences, An International Journal, 7(5), 1767-1771.

Asheghian, P. (2016), GDP growth determinants and foreign direct investment causality: The case of Iran. The Journal of International Trade and Economic Development, 25(6), 897-913.

Batten, J.A., Xuân, V.V. (2006), The Importance of Social Factors when Assessing the Impact of Foreign Direct Investment on Economic Growth. IIIS Discussion Paper No. 179.

Brandt, L., Rawski, T.G. (2008), China's Great Economic Transformation. New York, US: Cambridge University Press.

Carp, L. (2013), Anaysis of the relationship between fdi and economic growth–literature review study. The USV Annals of Economics and Public Administration, 12(15), 154-160.

Chung-Tong, W. (1985), China's special economic zones: Five years after an introduction. Asian Journal of Public Administration, 7(2), 127-143.

Curwin, K.D., Mahutga, M.C. (2014), Foreign direct investment and economic growth: New evidence from post-socialist transition countries. Social Forces, 92(3), 1159-1187.

Dritsakis, N., Stamatiou, P. (2014), Exports, foreign direct investment, and economic growth for five European countries: Granger causality tests in panel data. Applied Economics Quarterly, 60(4), 253-272.

Dunning, J.H., Lundan, S.M. (2008), Multinational Enterprises and the Global Economy. Cheltenham, UK: Edward Elgar Publishing.

Durham, J.B. (2004), Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. European Economic Review, 48(2), 285-306.

Engardio, P. (2005), China is a private-sector economy. Business Week Online, 22.

Fadhil, M.A., Almsafir, M.K. (2015), The role of FDI inflows in economic growth in Malaysia (Time Series: 1975-2010). Procedia Economics and Finance, 23, 1558-1566.

Frimpong, J.M., Oteng-Abayie, E.F. (2006), Bivariate causality analysis between FDI inflows and economic growth in Ghana. International Research Journal of Finance & Economics, 15, 103-112.

Graham, E.M., Wada, E. (2001), Foreign Direct Investment in China: Effects on Growth and Economic Performance. Working Paper No. 1-3.

Granger, R.F.E. (1987), Co-integration and error correction: Representation, estimation, and testing. Econometrica, 55(2), 251-276.

Gungor, H., Ringim, S.H. (2017), Linkage between foreign direct investment, domestic investment and economic growth: Evidence from Nigeria. International Journal of Economics and Financial Issues, 7(3), 97-104.

Gursoy, F., Sekreter, A., Kalyoncu, H. (2013), FDI and economic growth relationship based on cross-country comparison. International Journal of Economics and Financial Issues, 3(2), 519-524.

Herzer, D., Klasen, S. (2008), In search of FDI-led growth in developing countries: The way forward. Economic Modelling, 25(5), 793-810.

Irandoust, M. (2016), Structural changes, FDI, and economic growth: Evidence from the Baltic states. Journal of Economic Structures, 5(1), 14-23.

Johansen, S. (1988), Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control, 12(2), 231-254.

Karimi, M.S., Yusop, Z. (2009), FDI and Economic Growth in Malaysia. MPRA Paper No. 14999.

Ludoşean, B.M. (2012), A var analysis of the connection between FDI and economic growth in Romania. Theoretical and Applied Economics, 19(575), 115-130.

Na, Y. (2004), Explaining the Forms of FDI in China.

Nabila A.S.N. (2011), Relationship between FDI and economic growth in selected Asian countries: A panel data analysis. Review of Economics and Finance, 2, 84-96.

Ozturk, I., Acaravci, A. (2010), FDI, trade and growth in Turkey: Evidence from ARDL bounds testing approach. Argumenta Oeconomica, 2(25), 95-115.

Pandya, V., Sisombat, S. (2017), Impacts of foreign direct investment on economic growth: Empirical evidence from Australian economy. International Journal of Economics and Finance, 9(5), 121-130.

Parashar, S. (2015), Factors Affecting FDI Inflow in China and India. University of Alberta Research Experience.

Pazienza, P. (2014), The Relationship Between FDI and the Natural Environment Facts, Evidence and Prospects. Switzerland: Springer

International Publishing Switzerland 2014.

Pazienza, P. (2015a), The environmental impact of the FDI inflow in the transport sector of OECD countries and policy implications. International Advances in Econonic Reseasearch. 21(1), 105-116.

Pazienza, P. (2015b), The relationship between CO_2 and Foreign Direct Investment in the agriculture and fishing sector of OECD countries: Evidence and policy considerations. Intellectual Economics, 9(1), 55-66.

Seyoum, M., Wu, R., Lin, J. (2015), Foreign direct investment and economic growth: The case of developing African economies. Social Indicators Research, 122(1), 45-64.

Sridharan, P.V.N.C. (2009), Causal relationship between foreign direct investment and growth: Evidence from BRICS countries. International Business Research, 2(4), 198-203.

Szirmai, A., Verspagen, B. (2015), Manufacturing and economic growth in developing countries, 1950-2005. Structural Change and Economic Dynamics, 34, 46-59.

Szkorupová, Z. (2014), A causal relationship between foreign direct investment, economic growth and export for Slovakia. Procedia Economics and Finance, 15, 123-128.

UNCTAD. (1996), World investment report 1996: Inveistment, trade and international policy arrangements. Foreign Trade Review, 31(3), 85-109.

UNCTAD. (2007a), World Investment Report 2007. United Nationas Conference on Trade and Development, Geneva.

UNCTAD. (2007b), World Investment Report 2007.

UNCTAD. (2017), World Investment Report 2017, Investment and the Digital Economy. Geneva: United Nationas Conference on Trade and Development, p252.

Yarui, L.J.D.W., David, J.L. (2013), Causality among foreign direct investment and economic growth: A directed acyclic graph approach. Journal of Agricultural and Applied Economics, 45(4), 617-637.