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15 December 2013

A Peer Reviewed International Journal of Asian Academic Research Associates

AARJSH

ASIAN ACADEMIC RESEARCH JOURNALOFSOCIAL SCIENCE&HUMANITIES

FOREIGN DIRECT INVESTMENT IN CHINA: IT'S SECTORAL AND AGGREGATE IMPACT ON ECONOMIC GROWTH.

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Abstract

This study focuses on the impact of foreign Direct Investment (FDI) on the economic growth of China via selected sector of the economy. The time frame used is from 1995 to 2010. Times series data drawn from the primary, secondary and tertiary sectors of the economy are used for the analyses. Ordinary least Square multiple linear regression Econometrics models are specified and estimated using E-views statistical software (version7). The Kwiatkowski-Philips-Schmidt-Shin (SPSS) unit root tests for stationary indicates that the variables are stationary at level. The result indicate that there is a negative relationship between FDI and Economic Growth in the primary sector but show a positive relationship in both the secondary and tertiary sectors. However, the aggregate FDI and economic growth shows a positive relationship. We recommend (1) FDI attracting economic policies with greater attention to the secondary and tertiary sectors of the economy; (2) FDI attracting economic policies should pay more emphasis on the secondary sector at the early stage of such policies as this sector exerts growth enhancing spillover effects on other sectors and industries is the economy; (3) Economic policies that de-emphasise FDI into the primary sector as this may exert negative influence on economics growth; (4) Human resource capacity building economic policies that would take advantage of technology transfers and managerial skills acquisition occasioned by such FDI, moreso that some corporations technically deprive the host economies ready access to their advance technologies.

Key words: Foreign Indirect Investment, Sectoral and Aggregate impact, Economic growth in China.

1.0 Introduction

By complimenting domestic saving and domestic investments in the Chinese economy, Foreign direct Investment (hereinafter refer to FDI), in the last three decades has significantly enhanced economic growth in China. Usually, the benefits of FDI to host nations include: technology transfer, superior managerial skills, positive externalities, employment opportunities etc. these generally translate to positive economic transformation as they also help to increase income, savings and domestic investments. Thus, since the reformed and opening up policy in 1979, China has attracted enormous amount of FDI with positive growth effects on the economy. Accordingly. Eduardo, Jose & Jong-wha (1995) believe that FDI occasions technology transfer and thus contributes relatively more to economic growth than domestic investment.

The Chinese government (Central, Provincial and Local) provides varying degrees of incentives to stimulate FDI flows into its economy, making China about the largest recipient of FDI at present (Shaukat & Wei, 2005) surpassing the USA, in 2004, as host destination with total stock of $245,467 millions.

Inspite of well-known benefits of FDI indicated above, many scholars have argued that it exerts some negative effect on economic growth in some sectors of the economy, we have therefore, decided to empirically investigate this latter argument using time series data drawn from three sectors of the Chinese economy (1995 to 2010), namely; primary (natural resources); secondary (manufacturing) and tertiary (service).

The rest of the paper is divided into four (4) parts: section two (literature review); section three (methodology); section four (empirical result and discussion) and section five (conclusion and recommendation).

2.0. Theoretical and Empirical review

Though several research works have been done in China on the impact of FDI on it's economics growth, yet not much has been done to explain the impact along sectoral lines and the factors responsible for the variability.

In the 1970's the dependency theory (that swept across Latin America) held that multinationals were imperialist predators' exploiting and under-developing the developing countries. This

assertion may be corroborated by the fact that multinationals many times engage in exploitation of natural resources, and also the reaction against the 'extractive nature' FDI (UNCTAD, 1999). Laura (2003) believe that FDI flows into the primary, manufacturing and services sectors of the economy exert different effects on economic growth, UNCTACD (2001) tend to somewhat agree with Laura (2003). FDI improves employment condition conditions and the positive wage effects may be greater in developing than developed economies probably due to the larger technology gap between foreign and domestic firms in developed economies OECD-ILO, 2008). If the productivity of the foreign firms does not positively enhance the productivity of the domestic firms, the overall growth effect will not be as much as when both foreign and domestic firms contribute to economic growth (Lipsy, 2002). But there is a strong positive correlation between manufacturing sectors FDI and economic growth which is not as much in the primary and service sectors. This may be because not all sectors have the same potential to absorb foreign technology or to create linkages with the rest of the economy (Hirschman, 1958). But through knowledge diffusion effect from more advanced technologies from FDI, the rate of technological progress in host countries is increased (Findlay, 1978; Wang and Blomstrom, 1992) and generally FDI positively impact on productivity (Vincent and Andrea, 2004) and economic growth (Edwad and Erika; Wen. 2003; Whalley and Xian, 2006) through its interaction with human capital (Zhang,2001). But FDI's effect on growth varies across industries (Jiang and Masaru, 2010). It promotes income growth in China(James and Kam, 2006). Using 60 different countries Nadia(2006) discovered a positive effect of FDI in the manufacturing sector and negative effect in the services sector.

Keshava (2008) finds that in india and China, FdI does not have any significant effect on selected macroeconomic variables but exerts a positive effect on economic growth in general in both countries. Furthermore, it should be noted that sometimes while FDI stocks and output are mutually reinforcing in the manufacturing sector, no causal relationship seems to exist in the primary sector, and only a transitory effect of FDI on output in the services sector (Chandana and Peter, 2006). For Christopher (2007), FDI does not seem to be a panacea for economic growth and employment creation. But in Guandong, it is the main engine of growth with a divergent growth effect (Lo, 2005). Kevin (2006), using Penal data finds that FDI promotes economic growth and this positive effect increase over time and stronger in the Coastal than in the inland regions. Also the positive effect of FDI and economic growth in China was established by Nicole

and Sandra (2005, 2007). It should be noted that more studies on the Chinese economy establishes FDI positive growth effect in different regions across the country than those distinguishing this growth effect by industries/sectors of the economy. This is one of the justifications for this paper toward filling this gap.

3.0 Methodology

Cobb Douglas' production function forms the theoretical model/framework on which the econometric model used in this study is based. The production function assumes two factor inputs as follows:

$Y= A\ f(K^{\alpha}L^{\beta})$ where Y is the total output of the economy; L is the Labour utilized in production process; K is the capital. A is the technology/total factor productivity.

3.1. Model specification

$$\text{Log } Y_t = \beta_0 + \beta_1 \log Cap_t + \beta_2 \log Lab_t + \mu_t \ldots\ldots.(1)$$

Where Log Y_t is the log of real GDP

log Cap_t is the log of Capital stock at time t

$\beta_2 \log Lab_t$ is the log of Labour used at time t

We used the augmented cob-Douglas' production function (a modified form of equation 1), with FDI included as one of the factor inputs by splitting capital into FDI and domestic investment (Dinv.) Equation (1) is thus modified as:

$$\text{Log } Y_t = \beta_0 + \beta_1 \log Dinv_t + \beta_2 \log FDI_t + \beta_3 \log Lab_t + \mu_t \ldots\ldots.(2)$$

Log$Dinv_t$ is the log of domestic investment at time t

LogFDI_t is the log of foreign Direct investment at time t

LogLab_t is the Labour used at time t.

Like Clark (1940) and Fisher (1939), we de-aggregate economic activity (FDI in this case) into primary, secondary and tertiary sectors and control domestic investment and labour in order to determine the effect of FDI on each of these sectors. We thus modify equation (2) as follows;

$$\text{Log } Y_t = \gamma_0 + \gamma_1 \text{logFDI}_{tpri} + \gamma_2 \text{logFDI}_{tsec} + \gamma_3 \text{logFDI}_{tter} + \mu_t \quad \ldots\ldots.(3)$$

Where: Log Y_t = log of Real GDP

logFDI_{tpri} = log of FDI in primary industry

FDI_{tsec} = log of FDI in secondary industry

FDI_{tter} = log of FDI in tertiary

γ_1, γ_2 and γ_3 = elasticity in primary, secondary and tertiary industries respectively.

γ_0 = Intercept

μ_t = Disturbance term (Error term) (which includes other explanatory variables such as domestic investment, fixed capital investment, Educational level, Government policy, labour, technology etc).

t = Data collected at time t.

3.2. Data Description

Annual Time series data (from annual FDI utilized in 21 sectors of China's economy) was used but grouped into the national industrial classification in China (primary, secondary and tertiary). The data are in millions of US Dollars. We assume the traditional approach of homogeneity of FDI and hence do not determine the quality of FDI. We use domestic capital formation as proxy for domestic investment and number of employed persons per 10,000 persons as proxy for labour.

4.0. **Data Analysis and Discussion of Results.**

Stationarity (Unit Root) Tests summary

Table 4.1

Unit Root Tests							
Variable	**LRGDP**	**LDINV**	**LNEP**	**LFDI**	**$LFDI_{pri}$**	**$LFDI_{sec}$**	**$LFDI_{ter}$**
KPSS	0.122	0.164	0.171	0.153	0.153	0.125	0.145
Critical Value (*)	0.216	0.216	0.216	0.216	0.216	0.216	0.216
Result	**I(0)**	**I(0)**	**I(0)**	**I(0)**	**I(0)**	**I(0)**	**I(0)**
Notation: KPSS = Kwiatkowski-Phillips-Schmidt-Shin *: CV = 1% critical values (the underlying KPSS test regression includes. constant or constant and trend)							

Table 4.1 shows the summary of the results of the KPSS test on all the variable used in the model which shows that the variables are all stationary at level, as the KPSS test statistics are less than their respective critical values at 1%. Thus, the variables are I(0) and may yield a long-run co-integrating vector and as such the model is suitable in analyzing the medium-rum contribution of the exogenous variable to economic growth movements.

The result of the estimation of model two shows that an annual 1 percent increase in domestic investment will result in a annual 0.25 percent increase in real GDP. Similarly, an annual 1 percent increase in labour productivity will lead to an annual increase of 16.34 percent in real GDP. Furthermore, an annual 0.61 percent increase in real GDP. Thus FDI is positively affecting real GDP. R^2 indicates that 85 percent of changes in real GDP is accounted for by changes in the explanatory variable, while 15 precent of changes in real GDP are explained by other explanatory variables (outside the model). The Durbin Watson (DW) statistics 0f 1.63 indicates absence of serial correlation among the explanatory variables as the value is approaching 2. Thus, FDI exert a positive effect on economics growth in China in line with the findings of Chang and Zhang(1995), Wen(2003), James and Kam (2006), Keshara (2008), etc.

The result of the estimation of model 2 therefore, agrees with our a priori expectation. The estimation of model (3) reveals a negative coefficient (-0.114) of LPRI (Log of FDI in primary sector). This implies that an annual 1 percent increase in FDI inflows into the primary sector leads to real GDP (economic growth) decrease annually by 0.11 percent. This result is supported by the works of Laura, (2003); UNCTAD (1999,2001) and Lipsy, (2002) as the low linkages ability in the primary sector, the extractive and resource seeking nature of FDI (resource are relocated to home country of parent company) in the primary sector leave little or no growth effect in this sector.

On the other hand, FDI inflow in the secondary sector exerts a positive growth effect on the economy as 1 percent annual increase in FDI inflow into the secondary sector results in 0.428 percent annual increase in real GDP. This agree with study of Nadia (2006) who finds a positive growth effect of FDI in the manufacturing (secondary) sector. Our finding is in line with a apriori expectation as the secondary sector has a greater potential for FDI related linkages that translate into positive growth effects in the economy.

On the tertiary sector the elasticity of 0.833 implies a positive relationship of FDI and economics growth in this sector, as a one percent increase (annually) in FDI in the services sector will lead to a 0.833 percent increase (annually) in economic growth. Again, this result agrees with the findings that FDI in tertiary sector exerts a positive effect on economic growth [Kashava(2008); James and Kam (2006); Wen (2003); Zhang (2001) and Chang and Zhang(1995)].

On the whole, there is a difference or variation in the sectoral effect of FDI on economic growth in China (the effect is negative in the primary sector but positive in the secondary and tertiary sectors). This finding agree with the findings of Hirschman (1958), Laura (2003) and Jiang and Masaru (2010)

5.0 Conclusion and Recommendations

This study investigates, empirically, the sectoral and aggregate impact of FDI on economic growth in China (1995 to 2010). Two models were estimated. The estimated result of model two show that domestic investment, Labour and FDI (aggregate) all have positive impact on economic growth and 85 percent of the growth in the economy is occasioned by these

explanatory variables, this agree with our a priori expectation that FDI positively impacts on economic growth at least at the aggregate level.

The estimated result of model three (where FDI is de-aggregated shows that FDI inflow into the primary sector of the economy has a negative effect on economic growth while the effect is positive in the secondary and tertiary sectors. This shows that FDI effect has bias on industries (Jiang and Masaru, 2010).

5.1 Recommendations

Based on our findings, we recommend that (1) FDI attracting macroeconomic policies should be formulated to attract FDI as it spurs economic growth, at least the aggregate level. (2) though FDI should be attracted to both the secondary and tertiary sectors, to spur economic growth, yet emphasis should be on the secondary sector (at the early stage of FDI policy) as it has spillover effect on other industries in the economy through it wider array of economic linkages; (3) FDI inflow into the primary sector should not be encouraged due to its negative growth effect on the industry; (4) Government policy should adequately focus on human resource development through transfers of advanced technological know-how, superior managerial and marketing skills from the foreign corporations.

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Appendix

Regression Equation 1 (using E-view 7)

Dependent Variable: LRGDP
Method: Least Squares
Date: 12/12/11 Time: 08:17
Sample: 1995 2009
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-183.8298	82.21304	-2.236017	0.0470
LDINV	0.254810	0.475286	0.536119	0.6025
LNEP	16.34084	7.199743	2.269642	0.0443
LFDI	0.613366	0.671138	0.913920	0.3804

R-squared	0.848905	Mean dependent var	11.60949
Adjusted R-squared	0.807698	S.D. dependent var	1.071802
S.E. of regression	0.470010	Akaike info criterion	1.551053
Sum squared resid	2.430003	Schwarz criterion	1.739866
Log likelihood	-7.632896	Hannan-Quinn criter.	1.549041
F-statistic	20.60067	Durbin-Watson stat	1.631240
Prob(F-statistic)	0.000081		

Regression for Industry Specific Analysis (Using E-view 7)

Dependent Variable: LRGDP

Method: Least Squares

Date: 12/12/11 Time: 08:55

Sample: 1995 2009

Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.451179	18.44615	-0.295518	0.7731
LPRI	-0.114116	1.421813	-0.080261	0.9375
LSEC	0.427603	1.872871	0.228314	0.8236
LTER	0.832575	0.463601	1.795886	0.1000

R-squared	0.286991	Mean dependent var	11.60949
Adjusted R-squared	0.092534	S.D. dependent var	1.071802
S.E. of regression	1.021010	Akaike info criterion	3.102640
Sum squared resid	11.46707	Schwarz criterion	3.291453
Log likelihood	-19.26980	Hannan-Quinn criter.	3.100629
F-statistic	1.475859	Durbin-Watson stat	0.791296
Prob(F-statistic)	0.274814		