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IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH OF CHINA AFTER ECONOMIC REFORM

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Abstract
After the reformation and open-door policy, the economic and financial expansion of China has been faster than before. This study examines the impact of FDI on economic growth in China empirically. The paper uses time-series data over a period spanning from 1982 – 2019. From the results, FDI and trade have a positive impact on the GDP growth rate. The effects of each of the endogenous variables are examined via the Vector Error Correction Model (VECM). The study shows that there exist long-run associations between the FDI and the growth of GDP in China and short-run causality is found between them

Research paper

Keywords: FDI; Economic Growth; VECM Model; Economic Reform

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Introduction

China accomplished an inspiring economic growth of over 7 percent on an average from 1979 to 2019, which is achieved a significant growth rate in the world and plays a crucial role to attract foreign direct investment. According to Ho (2004), FDI in China grew gradually in the early 1980s but amplified speedily in the delayed of 1980s. The foreign exchange receipts, international trade, balance of payment, and technology transfer have been accelerated by FDI enhancement (Batrancea et al., 2019). China has become the 2nd highest FDI recipient and the emerging economy at the early stage of the 1990s. At this time, Hong Kong, Taiwan, Singapore, and Korea were the key investor countries towards China.

In 2019, the FDI in China receipt $110.6 billion US. Indeed, the total volume of production not only expanded by FDI but also increase by the reason for spillover effects and technological transfer (Zhang, 2002; Rahman and Majumder, 2020; Kuo and Yang, 2008). The economic diversification from an agriculture-based economy to an industrial economy, technological enhancement, and FDI plays a profitable role in developing nations (Singh & Ashraf, 2020; Kumar Mishra & Mishra, 2016). The technological change increases productivity and ensures efficiency in production with minimal production cost, at a time FDI has cabalistic effects on employment generation with the creation of a new production sector. Research and development also have a role in the development process (Keil et al., 2008).

Whatever, in many countries, FDI has significant contributions to economic and social enhancement. Developing nations have a considerable

lack of capital and technological advancement where FDI inflows support to mitigate this gap between economic growth and capital formations. Capital formation has captured the ability of production in a large volume, and technological sufficiency increases the quality of the business environment (Cao and Dowlatshahi, 2005; Majumder, 2016). Moreover, the study covers the following objectives:

i. To highlight the incentives and facilities provided by the Government institutions for encouraging FDI in China
ii. To study the drift and mould of inflows of FDI in China
iii. And to estimate the impact of FDI on the growth of the economy

The contribution of this study is to analyze the condition of China's economy with several aspects where FDI is the key term to influence the GDP growth in China. The considerable variables involved in the analysis are FDI, GDP growth rate, trade, money supply, electric power consumption, inflation, and infrastructure. The policy implication based on FDI inflows and other macroeconomic variables is the key aim of this study. The study will be prepared in the following manner; a theoretical overview will be presented. Then present the literature review that is interconnected to the matters of economic development and the position of FDI in the GDP growth progression. After completing the literature review, we developed a conceptual framework. This study also developed the methodology and analyzed the econometric results. Finally, in the last section of the paper, we present concluding comments.

Theoretical Overview

Trends of GDP Growth and FDI Inflow to China

In the case of sustainable economic growth, China is a great example in the world (Radović-Marković et al., 2019). The growth pattern was started to grow since opening the economy in 1979, and this amazingly reliable rate of GDP growth has existed throughout 1995-2003 (Zhang, 2005; Deshpande et al., 2014). According to Huang et al. (2016), China has attained more than 9 percent GDP growth after the economic reform in 1979, which is a supreme accomplishment for any nation in history. The income per capita was increase five times in 2004 than in 1979.

According to Hurley et al., (2019) and Yu et al., (2019), China officially disclosed its access to FDI with the channel of the "Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment" in 1979. After this year, China's government was established four special economic zones for contributing superior dealing to joint ventures. The subsequent treatment was operating for increasing in the business environment. Besides that, there were 14 cities selected for investment terms. Those cities were situated in the coastal zone with potential transport facilities.

In 1979 China has opened up to overseas trade and investment and executing free-market reorganizations, then it has been amongst the world's largest-budding economies, with GDP growth of practically 7% during 2019. In recent years, China has come out as the main global economic and operating power. It is currently the second greatest economy in the world,

major trading economics, greatest technologies, satisfactory exchange rate, largest business and largest holder of foreign exchange reserve (Morrison, 2019).

Table 1. Major Sources of FDI Flows to China: 1979-2017

($ billions and percentage of total)

Estimated Cumulative Utilize FDI: 1979-2017

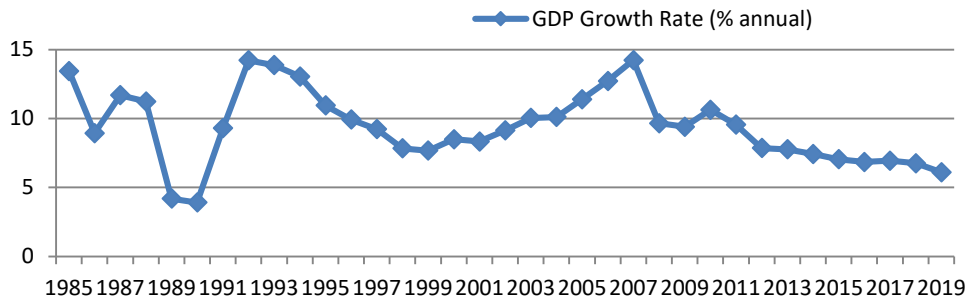
Country	**Amount**	**% of Total**
TOTAL	2688	100
HONGKONG	1241	46.2
B.VIRGIN ISLAND	286	10.6
JAPAN	165	6.1
SINGAPORE	108	4
GERMANY	87	3.2
S. KORIA	73	2.7
The U.S.	*72*	*2.7*

Source: IMF Coordinated Direct Investment Survey (2018).

Table 1 presents the main supply of FDI in China since 1979. At the end of the year 2017, a total of $2688 billion US in FDI is assurance, more than 1241 billion (46.2%) of which is reported for by Hong Kong followed by the British Virgin Islands whose total investment, $286 billion US (7.7%). Japan, Singapore, Germany, South Korea, and the USA are China's third, fourth, fifth, sixth, and seventh major foundations of FDI, correspondingly. After appreciative of the open entry rules in 1978, China practised an incredible growth of GDP which go up from 149.5 (billion $) in 1978 to 13.61(trillion $) in 2018 (Morrison, 2019; Salamzadeh, 2018; Salamzadeh et al., 2017). Figure 1 shows that the GDP growth rate fluctuated during 1985 -

2019. Its annual average growth rate was 9.79 percent from 1982 to 1991. After that, the average growth rate slightly increases to 10.36 percent from 1992 to 2001. During 2002 - 2011 it was 10.64 percent and about 7 percent during 2012 - 2019.

Figure 1. Trends of GDP Growth Rate (Annual %) in China 1985 - 2019

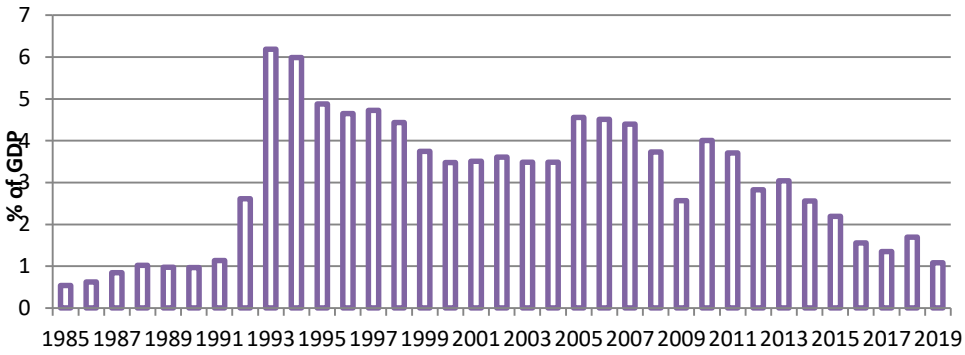


Source: WDI, World Bank, 2020

The provincial allocation of China's FDI inflows has been very jagged. Most of China's FDI has flowed into the coastal regions, and just a small amount of FDI has been invested in the inland regions. The coastal regions include China's three metro cities and nine coastal provinces. The inland regions include central, northeast, northwest, and southwest regions and provinces which cover about eighteen provinces and regions (Doshmanli et al., 2018; Radovic Markovic & Salamzadeh, 2018). The coastal regions are much developed than the inland regions. Amongst the coastal provinces, Shanghai, Jiangsu, Fujian, and Guangdong have hosted significant amounts of FDI inflows in the period 1978 to 2005. Guangdong has consistently been

the leading FDI recipient province from 1978 until the early 2000s, but in the most recent years, Jiangsu has become the largest FDI recipient province surpassing Guangdong (Tang, 2007).

Figure 2. FDI Inflows in China as (% of GDP) 1985 - 2019



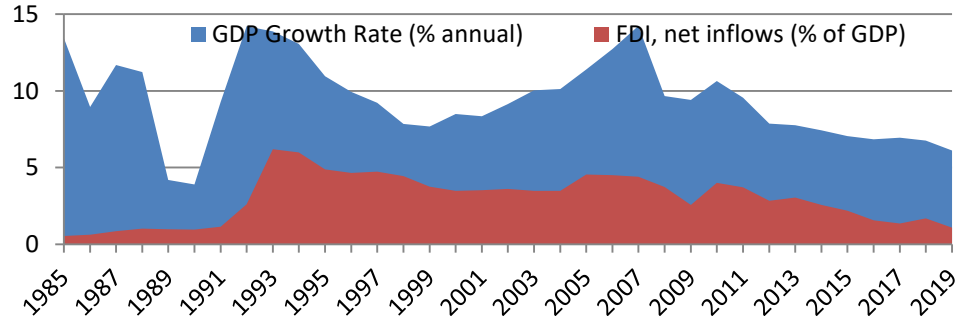
Source: World Development Indicators (WDI) (2020)

Figure 2 demonstrates the historical pattern of FDI over time in China. It is revealed that the quantity of FDI was only upgraded by a diminutive sum of FDI in the 1980s. In 1980, it was only $57 million US wherein 1990; it increased to $3487 million US. Many aspects ground the sluggish raises in FDI through this epoch, like policy setback, the stern prerequisite for overseas investors, indeterminate property rights, and inadequate investment situation.

Progressively improving the business climate, organization development, and other influential factors, the sum of FDI in China has sharply raised which endure till the global fiscal catastrophes in 2008. Figure 3 pro-

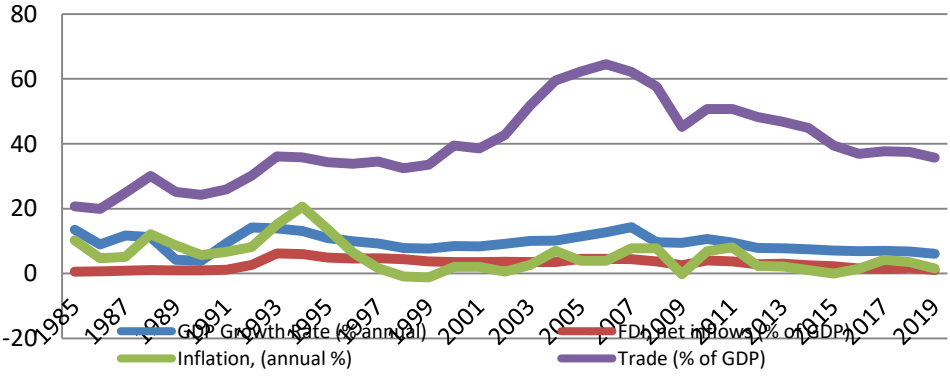
vides the situation of the economic growth rate of GDP and FDI inflows as a percentage of GDP. In 1982 FDI inflows were 0.2 percent of GDP and the GDP growth rate was 9.1 percent whereas in 2013 FDI increases to 3.9 percent of GDP but the GDP growth rate decreases to 7.7 percent. In 2019 FDI decreased to 1.09 percent of GDP and the GDP growth rate also decreases to 6.11 percent. Figure 4 shows the growth rate of GDP, trade, inflation, and FDI in China from 1985 to 2019.

Figure 3. GDP Growth Rate and FDI Inflows in China



Source: WDI (2020)

Figure 4. GDP Growth Rate, Trade, Inflation Rate& FDI Inflows in China



Source: World Bank, WDI (2020)

By 2005 China's economy taken position as the second leading in the world after the United States of America. It is a budding economy that proffers many market occasions for foreign investment. Infrastructure plays a significant role to attract FDI inflows to a host country. Table 2 presents the business climate scenario and competitiveness in some Asian countries in 2019-20 based upon the global competitiveness report.

Table 2. Business Climate and Competitiveness in Selected Asian Countries 2019-20 (Out of 141 Countries)

	BD	China	India	Indo.	Paki.	Phili	Singapore	Thai
Cost of starting a business % of GNI per capita	21.2	0.4	14.4	6.1	6.8	20.3	0.4	3.1
Time to start a business days	19.5	8.6	16.5	19.6	16.5	31	1.5	4.5
Property Rights (Rank out of 141)	126	58	65	53	94	53	3	73
Internal Labour Market Mob. 1–7 (best)	4.2	4.4	4.7	4.4	4.5	5.4	Not applicable	4.5
Soundness of banks 1–7 (best)	3.3	4.5	4.6	4.8	4.5	5.3	6.5	5.8
R&D expenditures % GDP	n/a	2.1	0.6	0.1	0.2	0.1	2.2	0.8
Global Competit. Index (rank)	105	28	68	50	110	64	1	40

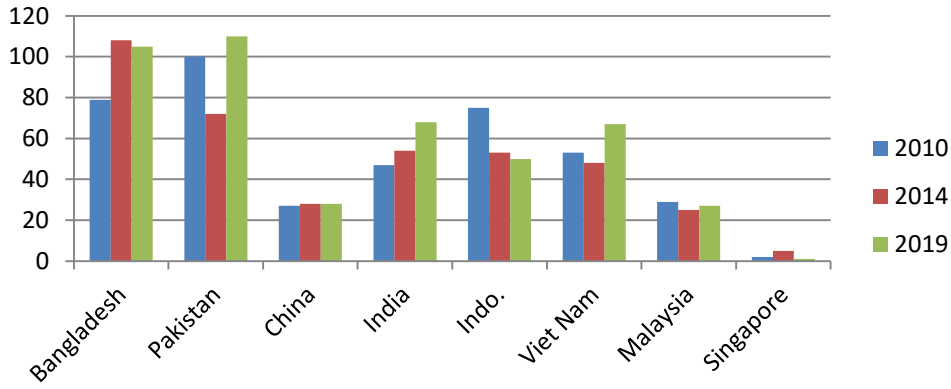
Source: Global Competitiveness Report 2019-2020.

Note: BD = Bangladesh, Indo = Indonesia, Paki = Pakistan, Phili = Philippines, Malay = Malaysia, Singa = Singapore, Thai = Thailand.

In China, it needs 8.6 days to start a business. But in Thailand and Singapore, it needs 4.5 and 1.5 days, respectively. It is also observed in Table 2 that most of the indicators of business climate are worse in China than in Thailand and Singapore in 2019-20.

According to the World Bank's Logistic Performance Index 2019, China's rank is 28 (whereas in 2012, the rank was 26) compared with 105 for Bangladesh; 68 for India; 50 for Indonesia; 27 for Malaysia; 110 for Pakistan; 1 for Singapore and 67 for Vietnam out of 141 countries. From Figure 5, it is observed that the position of China is better than some south Asian countries such as Pakistan, India, and Bangladesh, but worse than Singapore and Malaysia.

Figure 5. The World Logistics Performance Index 2019



Source: World Bank, LPI (2019)

Table 3. Quality of Infrastructure in Selected Asian Countries, 2019-20

(Rank Out of 141countries)

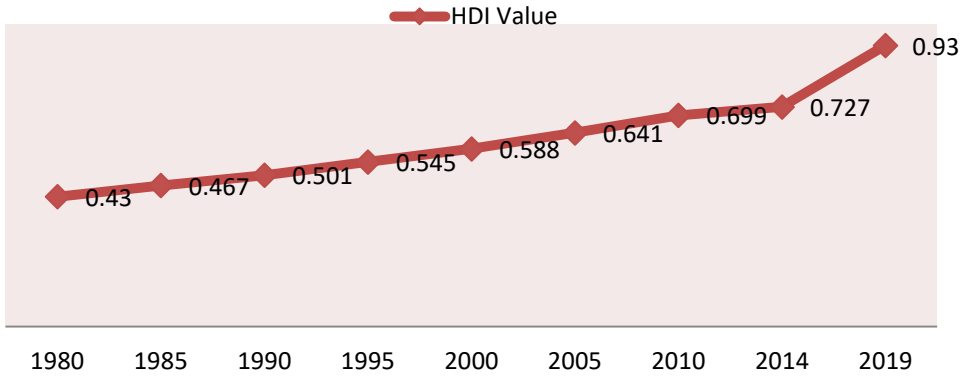
Country/ Economy	Overall	Qua. Road	Railroad	Liner shi. con	Airport conn.	Electricity Supply	Mobile Telephone Subscription
Bangladesh	114	117	40	78	63	68	106
China	36	45	61	1	2	18	78
India	74	48	39	25	4\	108	120
Indonesia	72	60	85	36	5	54	64
Malaysia	35	19	63	5	20	38	31
Pakistan	105	67	54	49	41	99	126
Philippines	96	88	88	59	26	83	54
Sri Lanka	61	76	35	16	59	39	77
Vietnam	77	103	58	22	19	62	14

Source: World Economic Forum (2019), the Global Competitiveness Report 2019–2020.

Table 3 shows the quality of infrastructure in selected Asian countries in the 2019-20 periods based on the yearly report of the world economic forum (WEF). It is observed in Table 3 that in terms of overall infrastructure quality of China ranks 36 out of 141 countries. China has a higher rank than some Asian countries such as Bangladesh (114); India (74); Indonesia (72); Pakistan (105); Philippines (96); Vietnam (77) and Sri Lanka (61) but lower than Malaysia (35). It is also observed that railroad infrastructure quality is better than the road, port, and air transport infrastructure in China. The electricity supply position of China in the world was 18 out of 141 in 2019-20.

According to the Human Development Report 2019, China's HDI value for 2019 is 0.93, which is set the nation in the elevated HDI category, positioning it at 85 out of 189 countries. Between 1980 and 2019, China's HDI value was augmented from 0.430 to 0.93.

Figure 6. Human Development Index 1980-2019 in China



Source: UNDP, (2019)

Literature Review

One of the most significant duties of FDI is asset inspiration that can speed up GDP in the host state. After economic transformation in 1978, China disclosed her window to overseas investors. It is happening to take up consideration about its rapid budding economy through the late 1980s and near the beginning of the 1990s. De Gregorio (1992), by investigating the occurrences of 12 Latin American states over the time 1950-1985, initiated that FDI heightened three times economic growth increased when the aggregate investment started.

The economic growth moderated by FDI towards the developing nations than the higher-income nation (Nasir et al., 2019; Majumder, 2019; Sarkodie and Strezov, 2019). Educations were more effective in lower-income developing nations concerning the importance of FDI. Chen et al. (1995) asserted that FDI needed in the case of domestic manufacturing, ex-

pansions of trade and FDI has an optimistic effect on GDP in China. The FDI has also mandatory on a growing number of conjugal manufacturers to participate internationally. In contrast, an open economy has an effective direction on China's GDP growth rate. The FDI has been influenced by GDP expansion in China's economy and has causality between them (Islam et al., 2018). According to Hao et al. (2018), energy utilization and financial development also increase GDP in China, these findings also supported by (Ouyang and Li, 2018; Isik et al., 2018; Udemba, 2019)

Wei (1995) in his paper " The Open Door Policy and China's Rapid Growth: Evidence from City-Level Data" argues that FDI has an affirmative effect on growth and expansion of international trade. This study also steed up that FDI is enhanced by the improvement of coastal cities. Ports and easy transport largely contribute to economic enhancement. Shah (2017) scrutinized the upshot of FDI on GDP in developing nations where the state the technological development, domestic investment, and capital formations have been largely dominated by FDI. However, the higher efficiency of FDI carries only while the host nations have the smallest amount of human capital (Wang and Luo, 2020).

The interrelationship between FDI and GDP examined by simultaneous equation procedures states that FDI increases GDP with the acceleration of human capital in developing nations but negative relation in case of technological deficiency (Li and Liu, 2005). These findings have similar to (Li et al., 2020; Yu and Xu, 2019). According to Lin et al. (2011); Feng et al. (2018), in their schoolwork, demonstrate that in general of production

purpose FDI is extensively encouraging, while this consequence relied much on the host state attract ability. The technological gap harms economic growth.

Hong (2013) has working GMM proposed to re-appraise the consequence of FDI on the economic growth in China and the applicable reason for FDI throughout the stage of 1994-2010. This research discovers that FDI exercises constructive contact on economic expansion, which is similar to (Kamal et al., 2019; Wang and Luo., 2020; Sung et al., 2018). Besides the infrastructure level, economies of scale, wage rate, human capital, and provincial differences cooperate enthusiastically with FDI and encourage economic growth in China. This study implies an analysis of FDI impact on the economy in China in case of major economic reform which is the prime analysis in this subject and literature.

Conceptual Framework

Figure 7. Considerable Influencing Factor of GDP

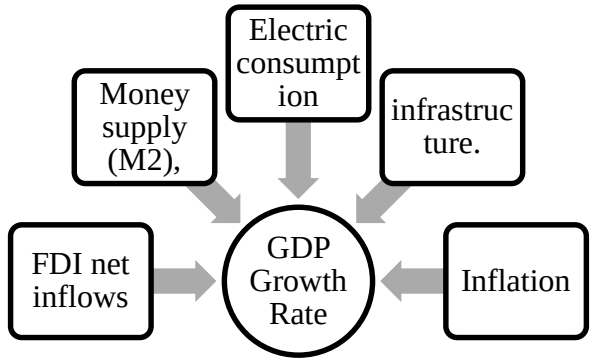
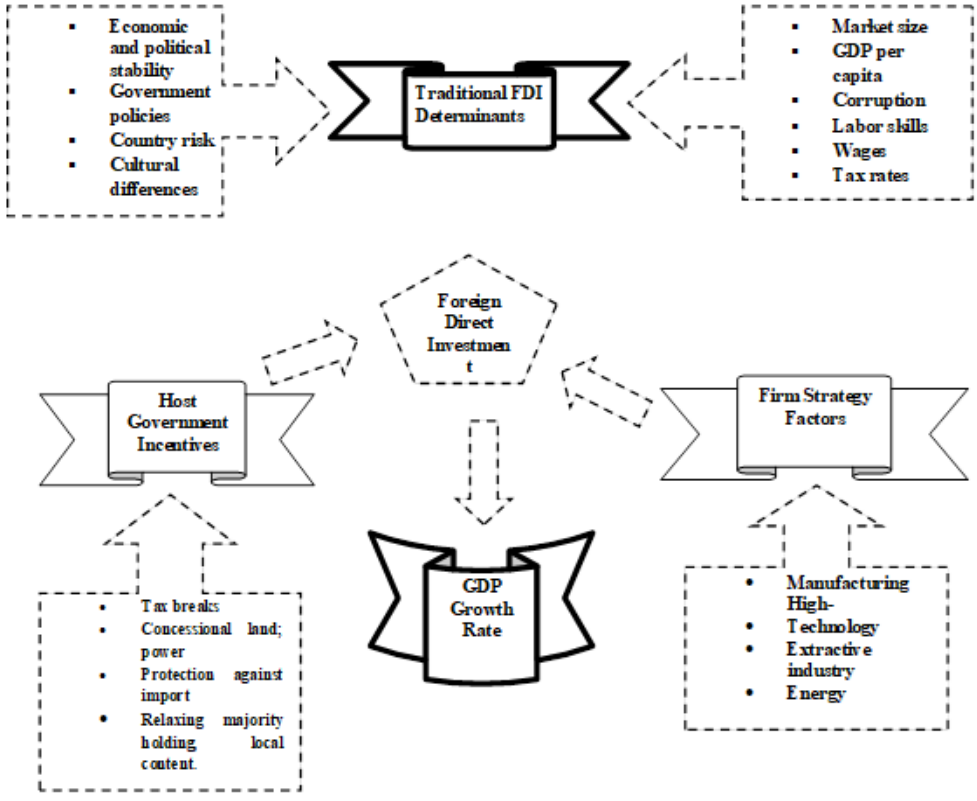


Figure 8. FDI Determinants and GDP growth Framework



The main purpose of this paper is to measure the impact of FDI inflows on China's GDP after economic reform. The FDI determinants are generally developed by several dimensions. The traditional determinants include economic stability, political situation, good governance, country risk, and cultural variations. Those factors are work as non-economic determinants of FDI. On the other hand wage rate, tax rate, market size, and per capita income. FDI also determinate by the tax breaks, concessional land; power, and protection against imports both are works as an incentive

of the host government. Manufacturing, technology, heavy industry, and energy also identical factors of FDI inflows of a nation, and those are known as firms' strategy. The final concentration is how FDI influences GDP growth which is measured by the empirical analysis section of this study

Methodology

Sources of Data and the Variables

The examination of the association between FDI, trade, and economic growth is executed in the case of China throughout 1982 – 2019. World development indicators (WDI) is the key data source of this study. The variables included in the model are: trade as a percentage of GDP, FDI net inflows as a percentage of GDP, GDP growth rate, money supply (M2), electric power consumption (KWh per capita), inflation (Annual %), mobile cellular subscription (per 100 people) is used as infrastructure. The first step of this study implies the Augmented Dickey-Fuller test for knowing the nature of the stationarity of selected variables. The ADF test suggests the need for the Johansen co-integration test. The VECM facilitates us to establish the equations of the replication, which will be derived by the least square method.

The technique of the study

The experimental scheme of this study takes up a restricted Vector Autoregressive model (VAR), which is frequently called Vector Error Cor-

rection Model-VECM. The variables involved in the analysis are FDI, GDP growth rate, trade, money supply, electric power consumption, inflation, and infrastructure. However, the detailed functional form of this model is written in equation (1) below:

$$GDPG = f(FDI, Trade, M2, EleC, Infl, \ Infra) \quad (1)$$

$$GDPG_t = \alpha_0 + \beta_1 FDI_t + \beta_2 Trade_t + \beta_3 M2_t + \beta_4 EleC_t + \beta_5 Infl_t + \beta_6 Infra_t + \mu_t \quad (2)$$

Now, take log transformations in both side

$$LnGDPG_t = \alpha_0 + \beta_1 LnFDI_t + \beta_2 LnTrade_t + \beta_3 LnM2_t + \beta_4 LnEleC_t + \beta_5 LnInfl_t + \beta_6 LnInfra_t + \mu_t \quad (3)$$

Where GDPG= Growth rate of Gross Domestic Product (Annual % Rate), FDI = Foreign Direct Investment (% of GDP), Trade = Trade is measured (export + import)/GDP (% of GDP), M2 = Money Supply (% of GDP), EleC= Electricity Power Consumption (KWh per capita), Infl = Inflation (Annual %), Infra = Infrastructure is used as a proxy of cellular mobile subscription (per 100 people), α_0 , $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$= represent parameters to be estimated, μ_t = Error Term, t = 1, 2, 3, . . . , 32 = Time period (1982-2019 period), time subscripts in the equation.

Results and Discussions

Table 4 represents the outcome of the descriptive statistics of the variables from 1979 to 2019. It finds that electric power consumption per capita (ELEC), GDP growth rate (GDPG), money supply (M_2), and inflation (INFL) are non-normal distributions, but foreign direct investment (FDI) and infrastructure (INFRA) are normally distributed because J-B ratio is significant. The J-B test is unsuccessful in eliminating the nominal hypothesis of the normal distribution of nearly all of the variables, which substantiates that the series are normally scattered.

Besides, the kurtosis for four variables is originated beneath 3, which points out the normality of distribution. The outline for the skewness of every variable is set up to be mild and skewed for FDI and GDPG, M_2, INFL, INFRA, and ELEC, which are negatively skewed. The low standard deviation has been found with comparing mean value which designates a petite coefficient of difference, excluding for FDI and INFRA. The variable FDI and INFRA, which represent the normality of distribution. The consecutive results indicate there is no inconsistency for each variable.

Table 4. Descriptive Statistics of the Variables

	GDPG	FDI	TRADE	M2	INFL	INFRA	ELEC
Mean	2.184	5.669	3.728	4.902	1.273	0.587	7.205
Median	2.221	1.457	3.675	5.019	1.366	2.613	7.230
Std. Dev.	0.310	9.764	0.313	0.358	0.949	4.067	0.692
Skewness	-0.786	1.638	-0.138	-0.679	-0.085	-1.169	-0.139
Kurtosis	3.853	3.706	2.361	2.315	1.889	3.113	1.586
Jarque-Bera	4.402	15.447	0.667	3.177	1.736	7.538	2.856
Probab.	0.111	0.000	0.716	0.204	0.420	0.023	0.240

Source: EViews (9) Output

Table 5. ADF test for unit root

Variables	**Constant and No Trend**		**Constant and Trend**	
	At Level	At 1st Differenced	At Level	At 1st Differenced
GDPG	-2.75	-7.30***	-3.16*	-7.29***
FDI	-0.45	-6.03***	-1.52	-6.14***
TRADE	-1.72	-4.66***	-0.65	-5.05***
M2	-1.33	-6.09***	-2.19	-6.34***
ELEC	-0.89	5.90***	-1.84	-5.87***
INFL	-2.94*	-6.59***	-3.14	-6.51***
INFRA	-1.63	-5,76***	-1.80	-5.72***
Note: *, **, and * denotes 10%, 5% and 1% level**				

Source: EViews (9) output.

The augmented Dickey-Fuller test emphasizes the degree of stationarity for the chosen variables. The findings may confirm whether we can pertain Johansen Co-Integration test or not to test the long-run correlation amongst the variables in the case of China. The outcomes exist in Table 5. All the variables have a unit root at level except ELEC, but when they are converted into first differences, they become stationary. Whatever the study concludes that all the determinants are integrated into first order I (1).

Table 6. Ordinary Least Squares Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPG (dependent variable)				
C	14.957***	2.779	5.381	0.00
FDI	1.392**	0.594	2.343	0.02
TRADE	0.125**	0.056	2.213	0.03
M2	-0.063*	0.038	-1.669	0.10
ELEC	-0.011*	0.006	-1.661	0.10
INFL	0.0061	0.119	0.051	0.95
INFRA	0.429*	0.232	1.842	0.07
R^2	0.412	Mean depe. var		10.072
Adj. R^2	0.271	S.D. dep.var		2.6596
F-stat.	2.922**	D-W stat		1.5802
Prob(F-stat.)	0.026			
Breusch-Godfrey Serial Correl. LM Test:				
F-stat.	1.182	Prob. F(1,24)		0.287
Obs*R-sq.	1.503	Prob. Chi-Square(1)		0.220
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-stat.	1.574	Prob. F (6,25)		0.196
Obs*R-sq.	8.776	Prob. Chi-Sq. (6)		0.186
Scaled expl. SS	8.900	Prob. Chi-Sq. (6)		0.179
Note: *, **, and *** denotes 10%, 5% and 1% level				

Source: EViews (9) Output

As seen in Table 6, the first point to notice is that half of the regression coefficients are separately had a momentous effect, for their *p* values are low at 10 percent and 5 percent level. The table shows that the coefficient of the variables FDI, trade, and infrastructure are statistically positively significant while those of money supply, electricity energy per capita, and inflation are negatively insignificant. Secondly, based on the *F* statistics one may conclude that collectively all the explanatory variables are highly statistically significant because its *p*-value is less than 5 percent that means all of the explanatory variables influence the dependent variable jointly. The R^2

value of the model is 0.41 which means the regression line is moderate fits in the data. The stability of the regression model is checked by various diagnostic tests. The outputs are accounted for in the lesser part of Table 6, which corroborates that the estimation of econometric possessions: it has a right well-designed form and the model's normally distributed (the Jarque-Bera probability is 0.236 which is not mentioned in the paper) serially uncorrelated and homoskedastic. Hence, the outcomes are suitable for a consistent explanation. Finally, the Cumulative Sum of Recursive Residual (CUSUM) has been assigned to measuring the stability of this model.

Table 7. Lag Order Selection Criteria of VAR Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-703.769		4.58e+12	49.018	49.348	49.121
1	-462.331	349.668	8750068.0	35.747	38.387	36.573
2	-369.576	89.5565	838047.7	32.729	37.679	34.279
3	-158.040	102.121*	139.1536*	21.520*	28.780*	23.793*

Source: EViews (9) Output

Besides, we select the lag length by using the VAR lag selection criteria. Five important criteria have been considered for selecting the ideal lag order. These criteria suggest the optimum lag order is 3, which is presents in Table 7.

Table 8. Johansen Test Result for Cointegration

Unrestricted Coint. Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Stat.	0.05 Cri. Value	Prob.**
None *	0.914	200.50	125.6	0.00
At most 1 *	0.774	126.77	95.75	0.00
At most 2 *	0.736	82.10	69.81	0.00
At most 3	0.456	42.11	47.85	0.15
Unrestricted Coin. Rank Test (Maximum Eigen value)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Stat.	0.05 Cri. Value	Prob.**
None *	0.914	73.73	46.23	0.00
At most 1 *	0.774	44.67	40.07	0.01
At most 2 *	0.736	39.99	33.87	0.00
At most 3	0.456	18.30	27.58	0.46

Source: EViews (9) Output

In Table 7, estimated lag 3 symbolized the perfect assortment because the outcome illustrates the criteria accepted via Eviews software.

Moreover, the trace test implies measuring neither long-run association nor no long-run association amid the variables in this model. Whatever, the Eigenvalue result indicates the null hyp. none is rejected and at most two assumptions are also rejected with a 0.05 percent level. The estimated upshot of the cointegration test has existed in Table 8. Since the Trace Statistic of 200.50, 126.77, and 82.10 are large than the critical value of 125.61, 95.75, and 69.81 the study concludes that there is a presence of long-run affiliation linking FDI and economic growth in China. This is also sustained by the fact that Max-Eigen Statistic of 73.73, 44.67, and 39.99 are larger than their respective critical values of 46.23, 40.07, and 33.87.

However, Table 8 explains the attendance of co-integration for the variables established in this cram, where it is numerically suitable and direc-

tion of long-run association amongst variables. Hence, we can discriminate between a long-run liaison among FDI inflows, GDP, money supply, inflation, infrastructure, and trade as a percentage of GDP. Thus, the effect gained will be analyzed as long-run relationships of the variables approved, which is the major objective of this study.

Table 9. The Long-run Relationship Model

Cointegrating Equation(s):		Log likelihood	-483.97
Normalized cointegr. coeff. (sta. error in parentheses)			
GDPGRT	TRADE	ELEC	INFRA
FDI	M2	INFL	
1.000	-0.381	-0.047	-2.051
0.034	0.058	0.109	
	(0.044)	(0.007)	(0.247)
(0.433)	(0.048)	(0.077)	

Source: EViews (9) Output

The standardized integration equation is represented in table 9 which discloses that trade and infrastructure have a negative long-run relationship with the growth of GDP in China. Other sides, FDI money supply, electricity consumption and inflation have a positive direction with economic growth.

Table 10. Vector Error Correction Estimates

Error Correction:	D(GDPG)	D(FDI)	D(TRADE)	D(M2)	D(ELEC)	D(INFL)	D(INFRA)
CointEq1	-0.725	0.283	-0.555	0.7009	-0.886	-0.303	0.011
	(0.26)	(0.091)	(0.466)	(0.61)	(4.864)	(0.38)	(0.072)
	[-2.781]	[3.08]	[-1.190]	[1.13]	[-0.18]	[-0.79]	[0.160]
CointEq2	2.492	-0.973	1.9109	-2.408	2.935	1.043	-0.039
	(0.895)	(0.314)	(1.601)	(2.11)	(16.70)	(1.31)	(0.249)
	[2.781]	[-3.091]	[1.19]	[-1.13]	[0.17]	[0.792]	[-0.15]

Source: EViews (9) Output

The VECM results of Table 10 reveal that about 72 percent of the disequilibrium is corrected each year by the change in economic growth in China. C (1) (see Table 11) is one period lag of the cointegration vector between FDI and economic growth. The ECT has a negative sign with a 5% significance level. The p-value of ECT is 0.01 percent which is lower than 5 percent. So, ECT has been significant. In this case, ECT determined that the long-run association flanked by GDP growth rate and FDI inflows. This means the FDI has the cause of GDP growth in the long-run. This result is represented in Table 11.

Table 11. Ordinary Least Squares Model, Dependent Variables: D(GDPG)

D(GDPG) = C(1)*(GDPG(-1) - 86.338*TRADE(-1) -22.288*M2(-1) + 7.104*ELEC(-1) - 62.928 *INFL(-1) - 379.324*INFRA(-1) + 4175.27) + C(2)*(FDI(-1) - 25.100*TRADE(-1) - 6.525*M2(-1) + 2.060*ELEC(-1) - 18.407*INFL(-1) - 110.166 *INFRA(-1) + 1223.677) + C(3)*D(GDPG(-1)) + C(4)*D(FDI(-1)) + C(5)*D(TRADE(-1)) + C(6)*D(M2(-1)) + C(7)*D(ELEC(-1)) + C(8) *D(INFL(-1)) + C(9)*D(INFRA(-1)) + C(10)

	Coefficient	Std. Error	t-Statistic	Prob.
C (1)	-0.725**	0.260	-2.781	0.01
C (2)	2.492**	0.895	2.781	0.01
C (3)	0.577**	0.209	2.753	0.01
C (4)	-0.387	0.657	-0.588	0.56
C (5)	0.089	0.116	0.773	0.44
C (6)	0.105	0.084	1.249	0.22
C (7)	0.001	0.011	0.094	0.92
C (8)	-0.155	0.154	-1.007	0.32
C (9)	0.584	0.536	1.090	0.28
C (10)	-2.334	1.771	-1.317	0.20
R-squ.	0.567	Mean dep. var		-0.10
F-stat.	2.911	D-W stat.		1.77
Prob(F-stat.)	0.022			

Note: *, **, and *** denotes 10%, 5% and 1% level

Source: EViews (9) Output

Table 12. Short- Run Causality relation between FDI and GDPG

Wald Test:			
Test Stat.	Value	df	Prob.
t-stat.	-0.588	20	0.56
F-stat.	0.346	(1, 20)	0.56
Chi-squ.	0.346	1	0.55
Null Hypothesis: C(4)=0			

Source: Eviews (9) Output

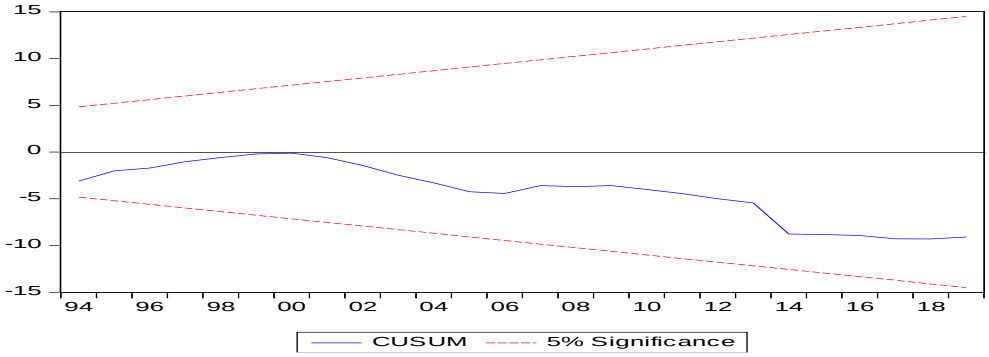
To check the short-run causality, the study used the Wald test from FDI to GDP. At this juncture, the coefficient C (4) is FDI. If the coefficient of FDI, C (4) influences the GDP growth rate, then we can articulate short-run cause from FDI to GDP growth rate. The equivalent Chi –squ is 55.60% which is large than 5 percent. So nominal hypothesis does not dis-card somewhat can agree to the null hypothesis. It means that the coefficient of FDI is zero. So the FDI having one lag does not cause economic growth rate in the short-run that is shown in Table 12.

Table 13. VECM Model Diagnostic tests

Test Statistics	**LM (χ2)**
Serial Correl. Test	0.39
Normality	0.52
Heteroskedasticity	0.68

Source: Eviews (9) Output

Figure 9. Stability Test of the Model: CUSUM Test



The necessary conditions for the suitability of a model are defined in three categories. Those are; no ARCH/ Heteroskedasticity effects in estimations, no serial correlation, or avoid spurious regression and finally, the estimation should be normally distributed. The current study fulfils those necessities to measuring the contact of FDI inflows on the economic growth rate in China which result decorated in Table 13 and the model also stable applying by CUSUM test because it exists within the range which is shown in figure 9

Concluding Comments

The paper has used the annual data from 1982 to 2019 to evaluate or reexamine the impact of FDI on economic growth in the Peoples Republic of China **which** is the second leading economy in the world after The USA. The target of the paper was to find out the associations between GDP growth, FDI, and trade the research adopts the time series framework, in-

cluding- the long-run association between FDI and GDP growth in Co-integration technique, causality test linking FDI and economic growth rate, and finally estimation in the long-run and short-run causality of the Chinese economic growth. The findings are similar to (Hu and Jefferson, 2002; Sun and Parikh; Ahmad et al., 2019; Xu et al., 2019).

The study investigated the effects of FDI as well as some other selected economic growth variables. The ADF test is used to test out the unit-roots of the variables. All the variables have a unit root at level except electricity power consumption per capita, but when they are converted at 1st differenced, they become stationary variables. It also investigated the causal associations amongst measured series. The research uses the Johansen and Juselius (1990) test, known as Johansen's. It shows that there is a presence of long-run relations flanked by FDI and GDP in China with considering a 5% significance level. The evidence of cointegration presents that there are long-run associations flanked by GDP and FDI and the coefficient values take a positive form while money supply, per capita electric power consumption, and inflation also affected economic growth positively. The VECM results reveal that about 72 percent of the disequilibrium is corrected each year by the change in economic growth in China. The result of the study also shows that there is short-run causality between FDI and the growth of GDP. The same results regarding the long-run affiliation between FDI and the growth of GDP have been found by Bayar (2014) in Turkey, Chowdhary and Kushwaha (2013) in India, Saqib et al. (2013) in Pakistan, Layla et al., (2020) in South Asia and Lo (2007), and Azam et al., (2019) in

China. But for China, this result is not reliable with the universal inclination in the literature such as Dess (1998), Zhang (2002), Zarea and Salamzadeh (2012), Caesar et al., (2018), and Yu-Chi and Lin (2018).

China's sizeable local market, cheap labour wage, and enhanced infrastructure harmonized with open FDI policies, particularly the concern of SEZs, seem to have critical causes in magnetizing FDI. Nevertheless, China might be perhaps concentrating even more on FDI if it improves the business environment, the global competitiveness, and governance indicators such as government effectiveness, the rule of law, control of corruption, and voice and accountability. Concerning policy suggestions, the government must focus on creating budgetary business sectors especially and acquaint new plans to withdraw in unfamiliar direct speculation. This will not just expand the volume of FDI in China yet additionally make the nation ready to accomplish productive advantages from internal FDI. Research and Development (R&D) in the domestic market should be better connected to technological progress and knowledge spillovers concerning the labour market. Moreover, If the Chinese government takes initiatives and gives some incentives to attract the world's largest sources of FDI, it could achieve much more FDI to develop its economy.

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