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Research Article

Analysis Model Design on the Impact of Foreign Investment on China's Economic Growth

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This research mainly analyzes the influence of foreign investment in the era of big data on China's economic growth, in the process of analyzing the impact of foreign investment on the national economy, based on the analysis of the current situation of foreign investment and error-correction model, etc., through the correlation coefficient matrix to determine the variables data needed to fit the model; after fitting the model, the residual model is extracted, and the stationarity of the residual sequence is tested . On the basis of the above, this paper analyzes the difference of foreign direct investment in different regions, combined with the coastal areas and central region model and actual situation analysis, analyzes the two foreign direct investment (FDI) development speeds, base development speed, and average development speed, at the same time for the two regions in 2017; the specific direction of FDI do a detailed analysis. Finally, a series of conclusions are obtained.

1. Introduction

For China, since the reform and opening up in 1978, the economy of the eastern coastal areas has shown a trend of rapid development, while the economic development of the central and western regions is relatively slow compared with the coastal areas [1–5]. The impact of foreign direct investment on China is very far-reaching, but due to China's large and vast territory, the impact of foreign direct investment on different regions is different [6, 7]. For example, Jiangsu is located in the eastern coastal areas of China, and it has the advantage of the eastern coastal areas. From 1978 to 2017, Jiangsu's foreign direct investment quota was from $639915 million to $2513541 million; located in the central of Henan; foreign direct investment increased from $495.27 million to $1722428 million. Only from the surface data observation, we can find the foreign direct investment quota in t'e two regions [8–11]. This research is devoted to t7-he analysis model design of the impact of foreign investment on China's economic growth, so as to provide decision support for the formulation of macroeconomic policies and the management and control of microeconomic operation.

2. Analysis of the Impact of Foreign Investment on the National Economy

2.1. Current Utilization of Foreign Investment in China. Since the reform and opening up, the level of China's export-oriented economy has been continuously improved, the scale of introducing and utilizing foreign capital has been continuously expanding, the level has been continuously improved, and the number of domestic foreign-invested enterprises has also been continuously increasing [9–12]. Next, the statistical analysis of foreign direct investment will be conducted from the change of foreign investment quota, capital source, and industrial investment.

2.1.1. Current Situation of Foreign Direct Investment in Recent Years. Data on the actual utilization of foreign direct

investment and foreign investment from 2009 to 2018 and 1999 to 2018 are processed in Figures 1 and 2.

From Figure 1, we can see that in the decade from 2009 to 2018, both actual utilized foreign direct investment and actual utilized foreign capital showed an upward trend, but the growth trend of actual utilized foreign investment and actual utilized foreign investment between 2012 and 2018 is slower than before. The actual use of foreign investment includes two parts, one is large foreign direct investment and the other is another foreign investment. From Figure 2, we can see the actual use of foreign direct investment and the actual use of foreign investment during the 20 years from 1999–2018 [13]. This shows that in the actual use of foreign investment, the actual use of foreign investment proportion gradually decreased, reduced to 0 in recent years. For example, in 2015, the actual utilization of foreign investment and the actual utilized foreign direct investment were the US $1,26,267 million, in 2016, both were US $12,6001 million, in 2017, both were US $13,1035 million, and in 2018, both were US $13,49,666 million, indicating that the actual utilization of other foreign investment in recent years was 0.

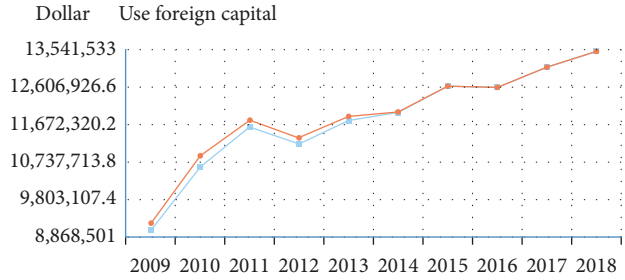

Figure 1: Actual use of foreign direct investment.

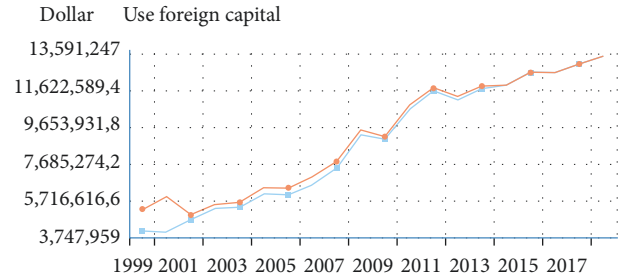

Figure 2: Data on the actual utilization of foreign capital.

2.1.2. Analysis of the Source Structure of Foreign Direct Investment. Under the background of the era of economic globalization, WTO was established on January 1, 1995, a total of 162 members, including a large part of the countries and regions in the world, can say the world economy roughly forms a whole, and the arrival of the electronic information age and transportation more and more convenient, our country and superior geographical location, rich resources attract all over the world to invest in our country [14–16]. China's foreign direct investment sources more areas, spread across five continents. Table 1 is the general situation of the sources of foreign direct investment in China from 2016 to 2018.

As can be seen from Table 1, China's foreign direct investment mainly comes from Asia, accounting for about 80%, while Hong Kong is the main source of foreign direct investment in China [17]. From the data, it can be concluded that more than half of China's foreign direct investment in China comes from Hong Kong, accounting for more than 60%. Among the five continents in the world, China's foreign direct investment from Africa is the least, which is less than 1%, which is directly related to the economic situation of Africa. Compared with Asia, the proportion of foreign direct investment from Europe, Oceania, and Latin America is also relatively small. From the above results, we can find that the source of a foreign direct investment structure is not reasonable, mainly foreign direct investment from Hong Kong. This phenomenon is related to the relationship between the mainland and Hong Kong; the transportation between China and Hong Kong region is very convenient, and for Hong Kong, the mainland also has various preferential policies. In addition, foreign direct investment is also directly related to the distance.

2.1.3. The General Situation of Foreign Direct Investment by Industry in China. This summary adopts the data of foreign direct investment in China in 2018 collected by the National Bureau of Statistics. Table 2 shows China's foreign direct investment in 2018 is roughly divided by industry (ten thousand dollars).

Taking out the largest amount of several industries from Table 2 into the pie chart, it is more convenient to see the specific direction of FDI in China (Figure 3).

It can be seen that China's foreign direct investment is mainly concentrated in the manufacturing, real estate, leasing, and business service industries, which account for about 62%. However, the FDI used for education, public management, and social organizations is particularly small, which shows that the introduction of FDI in China is extremely unbalanced in China, and the proportion of FDI varies greatly among various industries, which is also related to the main development of manufacturing and real estate industry in China.

2.2. Model Construction

2.2.1. Determination and Cointegration Test of the Sample Data. First of all, after inquiring about the database of the National Bureau of Statistics, the variables related to foreign direct investment ($X1$) include the number of contractual utilization of foreign investment projects ($X2$), the total import and export of foreign-invested enterprises (million US dollars) ($X3$) net foreign direct investment ($X4$), and the actual use of foreign direct investment ($X5$) [18–20]. Collect and collate data from 2009 to 2018 (incomplete data, so only 11 years). The correlation coefficient matrices were calculated between all the variables, such as in Table 3.

Table 1: Source structure of FDI in China (ten thousand dollars).

National	2016		2017		2018	
	Actual investment	Proportion	Actual investment	Proportion	Actual investment	Proportion
Summation	12600100	100%	13103500	100%	13496600	100%
Asia	9883103	78.44%	10919387	83.33%	10701310	79.29%
Hongkong	8146508	64.65%	9450901	72.13%	8991724	66.62%
Taiwan	196280	1.56%	177247	1.35%	139136	1.03%
Japan	309585	2.46%	326100	2.49%	379780	2.81%
Singapore	604668	4.80%	476318	3.64%	521021	3.86%
Korea	475112	3.77%	367253	2.80%	466688	3.46%
Africa	112720	0.89%	65746	0.50%	61042	0.45%
Europe	943439	7.49%	883619	6.74%	1119350	8.29%
Latin America	1221618	9.70%	636273	4.86%	902646	6.69%
North America	310421	2.46%	428552	3.27%	514789	3.81%
Oceania	126794	1.01%	160950	1.29%	190904	1.41%

Table 2: China's foreign direct investment in 2018 is roughly divided by industry (ten thousand dollars).

Index	Sum
Actual utilized amount of foreign direct investment	13496589
The amount of foreign direct investment actually utilized in agriculture, forestry, animal husbandry, and fishery	80131
The actual amount of foreign direct investment utilized in the mining industry	122841
The actual amount of foreign direct investment in the manufacturing industry	4117421
Actual utilization amount of foreign direct investment in the production and supply of electricity, gas, and water	442390
The amount of foreign direct investment actually utilized in the construction industry	148809
The actual amount of foreign direct investment in transportation, storage, and postal services	472737
Actual utilization amount of foreign direct investment in information transmission, computer services, and software industry	1166127
Actual utilization amount of foreign direct investment in the wholesale and retail industry	976689
The amount of foreign direct investment is actually utilized in the accommodation and catering industry	90107
The actual amount of foreign direct investment is utilized in the financial industry	870366
The actual amount of foreign direct investment is utilized in the real estate industry	2246740
The actual amount of foreign direct investment in leasing and business services	1887459
The amount of foreign direct investment actually utilized in scientific research, technical services, and the geological exploration industry	681298
The amount of foreign direct investment actually utilized by the water conservancy, environment, and public facilities management industry	47408
The amount of foreign direct investment actually utilized in residential services and other service industries	56166
The actual amount of foreign direct investment utilized in education	7420
The amount of foreign direct investment actually used in the health, social security, and social welfare industry	30178
The actual amount of foreign direct investment is utilized in the cultural, sports, and entertainment industries	52290
The amount of foreign direct investment actually utilized by public administration and social organizations	12

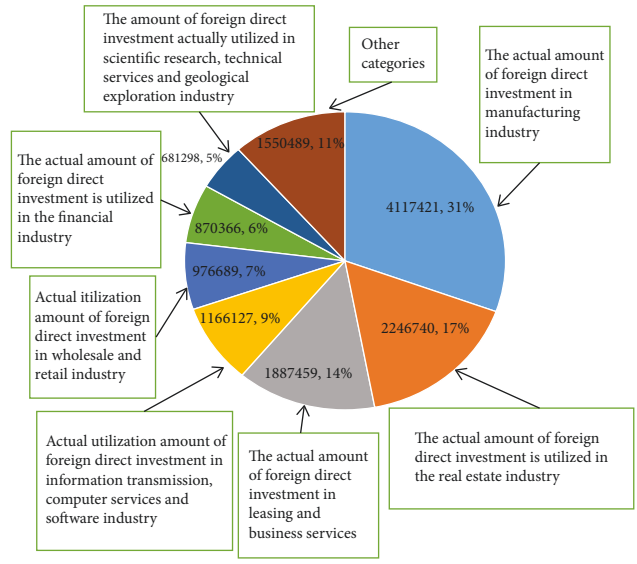

Figure 3: The proportion of FDI in various industries in China.

Table 3: Correlation coefficient matrix between the individual variables.

Covariance correlation	$X1$	$X2$	$X3$	$X4$	$X5$	Y
$X1$	$1.57E+12$ 1.000000					
$X2$	$7.92E+09$ 0.588991	$1.15E+08$ 1.000000				
$X3$	$2.10E+11$ 0.765397	$7.21E+08$ 0.306813	$4.79E+10$ 1.000000			
$X4$	$4.41E+12$ 0.825655	$1.56E+10$ 0.340532	$3.75E+11$ 0.401326	$1.82E+13$ 1.000000		
$X5$	$1.47E+12$ 0.998509	$7.51E+09$ 0.595392	$1.99E+11$ 0.775343	$4.04E+12$ 0.805613	$1.38E+12$ 1.000000	
Y	$2.03E+11$ 0.941857	$129E+09$ 0.696803	$2.31E+10$ 0.612225	$6.32E+11$ 0.860660	$1.88E+11$ 0.929698	$2.97E+10$ 1.000000

Table 3 shows that from 2009 to 2018, the correlation coefficient between FDI and actual FDI was 0.998509, indicating that the correlation between FDI and FDI is very high, and in the statistical Yearbook, some provinces have no data for FDI, so we can use foreign investment to measure FDI , and the correlation coefficient matrix can provide a theoretical basis for this. For the five variables with FDI, the correlation coefficient between foreign direct investment (X1) and the explained variables is the largest, indicating the strongest correlation between the two sets of data can be used as analyzed sample data.

Secondly, use Eviews to make a scatter map of China's GDP and foreign direct investment, as shown in Figure 4.

It can be seen from the figure that almost all points are evenly distributed on both sides of the line. GDP (Y) and F D of foreign direct investment I (X1) present a positive trend; combined with the correlation coefficient matrix, we can determine the two sets of time series as the analysis of the required data: economic growth is measured by GDP, recorded as Y: foreign direct investment with the actual use of foreign investment measured as an explanatory variable, recorded as FDI [21].

Next, the GDP (Y) and actual FDI from 2000 to 2019 will be taken as the sample data to analyze the problems. Table 4 shows China's GDP and FDI and its development speed.

Since both sets of GDP and actual FDI are time series, and the time-series data are often nonstable, the stability of GDPs and actual FDI is tested before analyzing the relationship between the two so as to prevent the phenomenon of false regression. After the first-order difference operation between GDP and actual foreign direct investment can pass the stability test of 95% confidence, so Y and FDI are the first-order single integral sequence, which belongs to the same order single integral variable, and may have a long-term stability relationship [22, 23]. Table 5 shows the unit root test results.

2.2.2. Sample Data Were Fitted. We take the GDP as the explanatory variable and the actual foreign direct investment as the explanatory variable. The model is set as follows:

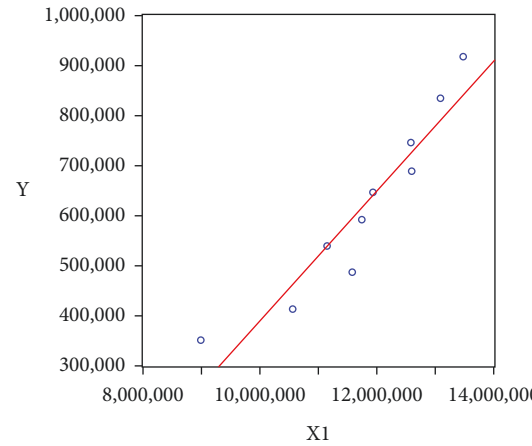

Figure 4: Scatter chart of China's GDP and foreign direct investment.

$$Y_t = C + \beta FDI_t + \mu_t. \tag{1}$$

The model is established by the least-squares method, and the results of the estimated parameters are shown in Table 6.

$$\begin{aligned} Y_t &= -331994 + 0.082954 FDI_t + \mu_t, \\ R^2 &= 0.916579\, F = 197.7735. \end{aligned} \tag{2}$$

Extract residuals:

$$\mu_t = Y_t + 331994 - 0.082954 FDI_t. \tag{3}$$

The residual stability (ADF) test is shown in Table 7.

The results show that the residual sequence is a nonsmooth sequence, which shows that there is no long-term stable relationship between Y and FDI, contradictory to the previous conclusion. Considering that the GDP unit is billions, and the actual foreign direct investment is dollars, the unit difference is particularly large, so the result may be the difference of units. So, the two groups of sample data measurement to eliminate the effect of the dimension take the logarithm of Y and FDI in Eviews 8.0. For the newly obtained data, Table 8 shows the stationarity test after taking the logarithm.

Table 4: China's GDP and FDI and its development speed.

Year	GDP/*a* hundred million	Month-on-month development speed	Foreign direct investment/ten thousand dollars	Month-on-month development speed
2000	100280.1	—	4071500	—
2001	110863.1	1.105534398	4687800	1.151369274
2002	121717.4	1.097907239	5274300	1.125111993
2003	137422.0	1.129025102	5350500	1.014447415
2004	161840.2	1.177687706	6063000	1.133165125
2005	187318.9	1.157431219	6032500	0.994969487
2006	219438.5	1.171470151	6582100	1.091106506
2007	270092.3	1.230833696	7476800	1.135929263
2008	319244.6	1.181983344	9239500	1.235755938
2009	348517.7	1.091694895	9003300	0.974435846
2010	412119.3	1.182491736	10573500	1.174402719
2011	487940.2	1.183978037	11601100	1.097186362
2012	538580.0	1.103782800	11171600	0.962977649
2013	592963.2	1.100975157	11758600	1.052543951
2014	643563.1	1.085333963	11956200	1.016804722
2015	688858.2	1.070381754	12626700	1.056079691
2016	746395.1	1.083525027	12600100	0.997893353
2017	832035.9	1.114739231	13103500	1.039952064
2018	919281.1	1.104857495	13496589	1.029998779
2019	990865.0	1.077869435	13810000	1.023221497

Table 5: Unit root test results.

Variable quantity	ADF	Type of inspection (c, t, n)	Critical value			Whether smooth
			1%	5%	10%	
Y	1.712258	(c, 0, 1)	−3.857386	−3.040391	−2.660551	No
DY	−5.478450	(c, 0, 1)	−3.920350	−3.065585	−2.673459	Yes
FDI	−0.801904	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DFDI	−3.692204	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes

Table 6: Regression results of Y versus FDI.

Variable	Coefficient	Std. Error	*t*-Statistic	Prob.
C	−3319941	58229.45	−5701480	0.0000
FDI	0.082954	0.005899	14.06319	0.0000
		Mean dependent var		
R- Squared	0.916579	S.D. dependent var		441466.8
Adjusted R-squared	0.911945	Akaike info criterion		2882374
S. E.of regression	85531.89			25.64581
Sum squared resid	1.32E+11	Schwarz criterion		25.74538
Log-likelihood	−254.4581	Hannan–Quinn criteria		25.66524
f-statistic	197.7735			0.315429
prob (F-statistic)	0.000000	Durbin–Watson stat		

Note. Data are obtained from the Eviews 8.0 regression results.

Set the model after eliminating the dimension to the following:

$$\ln Y_t = C + \alpha \ln FDI_t + \mu_t. \quad (4)$$

Then, Table 9 shows the results of the regression of lnY versus lnFDI.

Table 7: An ADF test for the extracted residuals.

		t-Statistic	Prob.*
Augmented dickey-fuller test statistic		−0.321640	0.9035
Test critical values:	1% level	−3.857386	
	5% level	−3.040391	
	10% level	−2.660551	

The results of the Granger causality test [9] show that the F value of $Y = 0.53843 < 0.80041$, which shows that gross domestic product (Y) is not the reason for FDI, and similarly, FDI is the reason for gross domestic product (Y).

2.3. Establishment of the Error-Correction Model. According to Granger's theorem, the error-correction model can be established with the cointegration relationship between the nonstationary variables, so we can establish the error-correction model between the above two variables. Table 10 shows the cointegration regression results of GDP and FDI.

The resulting error-correction model is as follows:

Table 8: The stationarity test after taking the logarithm.

Variable quantity	ADF	Type of inspection (c, t,n)	Critical value			Whether smooth
			1%	5%	10%	
lnY	−1.917836	(c, 0,1)	−3.857386	−3.040391	−2.660551	No
DlnY	−5.503037	(c, 0,1)	−3.920350	−3.065585	−2.673459	Yes
lnFDI	−2.114963	(c, 0,1)	−3.857386	−3.040391	−2.660551	No
DlnFDI	−5.704385	(c, 0,1)	−3.920350	−3.065585	−2.673459	Yes

Table 9: Results of the regression of lnY versus lnFDI.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	−17.16385	1.095876	−15.66222	0.0000
LNFDI	1.872453	0.068567	27.30825	0.0000
R-squared	0.976432	Mean dependent var		12.75370
Adjusted R-squared	0.975122	S.D. dependent var		0.758087
S.E.of regression	0.119570	Akaike info criterion		−1315187
Sum squared resid	0.257347	Schwarz criterion		−1215613
Log-likelihood	15.15187	Hannan–Quinn criteria		–1.295749
F- Statistic	745.7405	Durbin–Watson stat		0.834389
Prob (F-statistic)	0.000000			

Note. Data are obtained from the Eviews 8.0 regression results.

Table 10: Cointegration regression results of GDP and FDI.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.095734	0.011135	8.597814	0.0000
D (LNFDI)	0.457138	0.130286	3.508719	0.0043
ET (–1)	0.034950	0.124309	0.281156	0.7834
R-squared	0.513749	Mean dependent var		
Adjusted R-squared	0.432707	S.D. dependent var		
S.E.of regression	0.033125	Akaike info criterion		0.120798
Sum squared resid	0.013167	Schwarz criterion		0.043980–3.800180 -3.658570–3.801689
Log-likelihood	31.50135	Hannan–Quinn criteria		1.077134
G- Statistic	6.339296	Durbin–Watson stat		
Prob (F-statistic)	0.013218			

$$\Delta \ln \hat{Y}_t = 0.095734 + 0.457138\Delta \ln FDI_t + 0.034950 e_{t-1},$$
$$R^2 = 0.513749 DW = 1.077134. \tag{5}$$

The error-correction model $R^2 = 0.513749$is relatively bad, but P is far less than 0.05, so the model can be adopted.

2.4. Empirical Results Analysis. The empirical results show two aspects: (1) In the short term, FDI has a significant influence on GDP (i. *e*., economic growth). (2) In the long run, significant impact of FDI on GDP (i. e., economic growth). One percentage point change of FDI will cause a 0.46 percentage point change, and the large introduction of FDI will cause rapid growth of GDP.

2.5. Chapter Conclusion. In this section, the variable data needed to fit the model was first determined by the correlation coefficient matrix. After fitting the model, the residue is extracted, and the stationarity of the residue sequence is tested. Granger causality tests the model to find that FDI is the cause of Y. Finally, the model is corrected for error-correction and empirical analysis.

3. The Impact of Foreign Direct Investment on the Economy of Different Regions

3.1. Model Construction. When analyzing the impact of foreign direct investment on the economy of different regions, the factors with great impact on economic growth, such as consumption level, net export and labor force level (L), and domestic direct investment, should be combined [24, 25]. The sample data required for the analysis of the economic growth (Y) by FDI, consumption level (CPI), net export (NE), labor (L), (L), domestic investment (K), after the elimination of magnitude, the model can be set as follows:

$$\ln Y_t = \alpha_1 \ln FDI_t + \alpha_2 \ln NE_t + \alpha_3 \ln K_t + \alpha_4 \ln L_t + \alpha_5 \ln CPI_t + \mu_t. \tag{6}$$

3.1.1. Economic Growth Model of Coastal Areas (Jiangsu Province as an Example). Consumption level is measured by per capita consumption (CPI), labor (L) is employed, NE is expressed by the difference between exports and imports, and domestic investment (K) is measured by social fixed asset investment. Data of each variable in Jiangsu Province are collected as shown in Table 11.

Due to the inconsistent dimensions of each index, the influence of log-eliminating the dimensions and the sample data are all time-series data, so the stability needs to be tested. According to the results in Table 11, the first-order difference sequence is stationary [26–35], indicating a long-term relationship between these variables. Table 12 shows the test of the stationarity of the sample data.

The model can therefore be set to the following:

$$\ln Y_t = \alpha_1 \ln FDI_t + \alpha_2 \ln NE_t + \alpha_3 \ln K_t + \alpha_4 \ln L_t + \alpha_5 \ln CPI_t + \mu_t. \quad (7)$$

The results of fitting these variables at Eviews 8.0 are shown in Table 13.

The resulting fitted model is as follows:

$$\ln Y_t = 0.063049 \ln FDI_t + 0.045071 \ln NE_t + 0.490681 \ln K_t + 0.223155 \ln L_t + 0.268569 \ln CPI_t + \mu_t, \quad R^2 = 0.999152. \quad (8)$$

Table 14 shows the Stationarity test of the residuals. It can be seen that the fitting effect is good, and then the residuals of the model are proposed as follows:

$$\mu_t = \ln Y_t - 0.063049 \ln FDI_t - 0.04507 \ln NE_t - 0.490681 \ln K_t - 0.223155 \ln L_t - 0.268569 \ln CPI_t. \quad (9)$$

The results in Table 13 show that at the 5% significance level, the value of the t-test statistic is-3.629831, less than the cut-off of-3.052169, rejecting the null hypothesis that the residual root from the model and the residual sequence are a stationary sequence, and the long-term relationship between the explanatory variables and the explained variables can be learned.

3.1.2. Economic Growth Model of the Central Region (Henan Province as an Example). Data was collected first according to the coastal area operation method. The results obtained are as shown in Table 15.

All the data in Table 15 are done as in the previous section, and Table 16 shows the test of the stationarity of the sample data.

The model-fitting results are as follows:

$$\ln Y_t = 0.044262 \ln FDI_t + 0.042003 \ln NE_t + 0.526400 \ln K_t + 0.523185 \ln L_t - 0.040786 \ln CPI_t + \mu_t, \quad R^2 = 0.998457. \quad (10)$$

Extract residuals:

$$\mu_t = \ln Y_t - 0.044262 \ln FDI_t - 0.042003 \ln NE_t - 0.0526400 \ln K_t - 0.523185 \ln L_t + 0.040786 \ln CPI_t. \quad (11)$$

Table 17 is the Residual stationarity test. The results in Table 17 show that at the 5% significance level, the value of the t-test statistic is −3.748439, less than the cut-off of −3.052169. Thus, it rejects the null hypothesis that the residual roots from the model and the residual sequence are stationary sequences, and the long-term relationship between the explanatory variables and the explained variables can be learned.

3.2. The Differences Were Analyzed by Combining the Two Regional Models and the Actual Situation

3.2.1. Analysis of the Speed of FDI in the Two Regions. Taking the quota of foreign direct investment from 1999 to 2017 as the research object, the sequential development rate, fixed base development rate, and average development rate are calculated as shown in Table 18.

It can be seen from the calculation results in Table 18 that the month-on-month development rate of foreign direct investment in Jiangsu Province is basically stable between 0.84 and 1.15, while the floating range of the month-on-month development rate in Henan Province is between 0.66 and 1.67, which is slightly larger than that of Jiangsu Province.

The average development speed of FDI in Henan province and Jiangsu Province is calculated as follows:

$$\overline{x}_G = \sqrt[n]{x_1 x_2 \cdots x_n} = \sqrt[n]{R}. \quad (12)$$

According to the formula, the average development rate of FDI in Henan province is 1.20537, while the average development rate of FDI in Jiangsu Province is 1.07466. It can be seen that the average development rate of FDI in Henan province is higher than that of Jiangsu Province, but because its base is far smaller than that of Jiangsu Province, although it has grown too fast in the past 20 years, it is much different from Jiangsu Province.

3.2.2. Analysis of the Industrial Structure of Foreign Direct Investment in the Two Regions. The general situation of FDI by industry is as follows: the total foreign direct investment in 2017 was $2513541 million, of which FDI of manufacturing was $1118072 million, real estate $346007 million, leasing and business services $223912 million, electricity, heat, gas, and water production and supply $578.78 million, construction $2276.35 million, and other industries accumulated $540.34 million, as shown in Figure 5.

In 2017, FDI in Henan province showed a total FDI of $1722428 million, including manufacturing utilization FDI of $1034835 million, electricity, heat, gas, and water $2311.5 million, leasing and business services $8788.44 million, real estate $187056 million, construction $27.56 million, and $178,7.87 million in other industries. Figure 6 shows the portion of FDI industries in Henan Province.

Table 11: Data of each variable in Jiangsu Province.

Year	GDP(Y)/*a* hundred million	FDI/ten thousand dollars	Consumption per person (CPI)/ Yuan	Quantity of employment (L)/thousands of people	Social fixed assets investment(K)/*a* hundred million	Net export amount (NE)/ten thousand dollars
1999	7697.82	639915	3594	4390.71	2742.65	53.57
2000	8553.69	642358	3873	4418.14	2995.43	59.02
2001	9456.84	712201	4123	4436.45	3302.96	64.01
2002	10606.85	1036615	4708	4472.84	3849.24	66.55
2003	12442.87	1580214	5261	4499.97	5335.80	46.10
2004	15003.60	1213783	5913	4537.07	6827.59	41.37
2005	18598.69	1318339	7066	4578.75	8739.71	180.23
2006	21742.05	1743140	8182	4628.95	10071.24	368.42
2007	26018.48	2189206	9530	4677.88	12268.07	577.95
2008	30981.98	2512001	10882	4700.96	15060.45	838.04
2009	34457.30	2532289	11993	4726.54	18949.88	596.54
2010	41425.48	2849777	14035	4754.68	23184.28	753.08
2011	49110.27	3213173	17167	4758.23	26314.66	854.87
2012	54058.22	3575956	19452	4759.53	31706.58	1089.83
2013	59753.37	3325922	23585	4759.89	35982.52	1068.69
2014	65088.32	2817416	28316	4760.83	41552.75	1199.76
2015	70116.38	2427469	31682	4758.50	45905.17	1317.23
2016	77388.28	2454296	35875	4756.22	49370.85	1290.76
2017	85869.76	2513541	39796	4757.80	53000.21	1354.58

Table 12: Test of the stationarity of the sample data.

Variable quantity	ADF	Type of inspection (c, t, n)	Critical value			Whether smooth
			1%	5%	10%	
lnY	−1.650678	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnY	−3.675515	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnFDI	−2.432745	(c, 0, 1)	−3.920350	−3.065585	−2.673459	No
DlnFDI	−5.173851	(c, 0, 1)	−3.920350	−3.065585	−2.673459	Yes
lnNE	−1.153147	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnNE	−3.732355	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnK	−2.191837	(c, 0, 1)	−3.920350	−3.065585	−2.673459	No
DlnK	−6.132102	(c, 0, 1)	−3.920350	−3.065585	−2.673459	Yes
lnL	−2.104357	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnL	−3.100355	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnCPI	0.304070	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnCPI	−4.820446	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes

Table 13: Fitting results of Jiangsu Province Economic Growth Model.

Variable	Coefficient	Std. Error	*t*-Statistic	Prob.
LNFDI	0.063049	0.043332	1.455021	0.1677
LNNE	0.045071	0.014036	3.211034	0.0063
LNK	0.490681	0.079267	6.190201	0.0000
LNL	0.223155	0.069220	3.223851	0.0061
LNCPI	0.268569	0.079660	3.371430	0.0046
	0.999152	Mean dependent var		1023329
	0.998910	S.D. dependent var		0.811391-
				4.180496-
R-squared adjusted R-squared S.E. of regression sum squared resid log-likelihood Durbin–Watson stat	0.026792	Akaike info criterion		3.931960- 4.138434
	0.010049	Schwarz criterion		
	44.71471	Hannan–Quinn criteria		
	1.600222			

Table 14: Stationarity test of the residuals.

		t-Statistic	Prob.*
Augmented Dickey–Fuller test statistic		−3.629831	−0.0166
Test critical values:	1% level	−3.886751	
	5% level	−3.052169	
	10% level	−2.666593	

Table 15: Data of each variable in Henan Province.

Year	GDP(Y)/*a* hundred million	FDI/ten thousand dollars	Consumption per person (CPI)/Yuan	Quantity of employment (L)/thousands of people	Social fixed assets investment(K)/*a* hundred million	Net export amount (NE)/ten thousand dollars
1999	4517.94	49527	1905	5205	1206.83	5.0734
2000	5052.99	53999	2215	5572	1377.74	7.1190
2001	5533.01	35861	2381	5517	1544.06	6.3840
2002	6035.48	45165	2553	5522	1725.93	10.3401
2003	6867.70	56149	3083	5536	2262.97	12.4442
2004	8553.79	87367	3625	5587	3099.38	17.3874
2005	10587.42	122960	4092	5662	4311.63	24.6582
2006	12362.79	184526	4530	5719	5904.71	34.7399
2007	15012.46	306162	5141	5773	8010.11	39.7798
2008	18018.53	403266	5877	5835	10490.64	39.5846
2009	19480.46	479858	6607	5949	13704.50	12.5457
2010	23092.36	624670	7837	6042	16585.86	32.7737
2011	26931.03	1008209	9171	6198	17768.95	58.3868
2012	29599.31	1211777	10380	6288	21450.00	76.0549
2013	32191.30	1345659	11820	6387	26087.46	120.1733
2014	34938.24	1492688	13078	6520	30782.17	137.3452
2015	37002.16	1608637	14507	6636	35660.35	123.4221
2016	40471.79	1699312	16043	6726	40415.09	144.4215
2017	44552.83	1722428	17842	6767	44496.93	164.4519

Table 16: Test of the stationarity of the sample data.

Variable quantity	ADF	Type of inspection (c, t, n)	Critical value			Whether smooth
			1%	5%	10%	
lnY	−1.385376	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnY	−4.270420	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnFDI	−0.842845	(c, 0, 1)	−3.920350	−3.065585	−2.673459	No
DlnFDI	−3.119600	(c, 0, 1)	−3.920350	−3.065585	−2.673459	Yes
lnNE	−0.819215	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnNE	−4.411203	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnK	−1.851008	(c, 0, 1)	−3.920350	−3.065585	−2.673459	No
DlnK	−2.754575	(c, 0, 1)	−3.920350	−3.065585	−2.673459	Yes
lnL	2.360425	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnL	−3.633860	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes
lnCPI	−0.236929	(c, 0, 1)	−3.886751	−3.052169	−2.666593	No
DlnCPI	−5.661558	(c, 0, 1)	−3.959148	−3.081002	−2.681330	Yes

Note. The data are obtained from Eviews 8.0.

Table 17: Residual stationarity test.

		t-Statistic	Prob.*
Augmented Dickey–Fuller test statistic		−3.748439	0.0131
Test critical values:	1%level	−3.886751	
	5%level	−3.052169	
	10%level	−2.666593	

3.2.3. Analysis of the Causes of the Difference. The economic growth model of Henan Province is as follows:

$$\begin{aligned}\ln Y_t = {} & 0.044262 \ln FDI_t + 0.042003 \ln NE_t \\ & + 0.526400 \ln K_t + 0.523185 \ln L_t \\ & - 0.040786 \ln CPI_t + \mu_t.\end{aligned} \tag{13}$$

Table 18: Speed of FDI development in both regions.

Year	Henan Province			Jiangsu Province		
	FDI	Month-on-month development speed	Determine the development speed of the foundation	FDI	Month-on-month development speed	Determine the development speed of the foundation
1999	49527	—	—	639915	—	—
2000	53999	1.09029	1.09029	642358	1.00382	1.00382
2001	35861	0.66410	0.72407	712201	1.10873	1.11296
2002	45165	1.25945	0.91193	1036615	1.45551	1.61993
2003	56149	1.24320	1.13370	1580214	1.52440	2.46941
2004	87367	1.55598	1.76403	1213783	0.76811	1.89679
2005	122960	1.40740	2.48269	1318339	1.08614	2.06018
2006	184526	1.50070	3.72577	1743140	1.32222	2.72402
2007	306162	1.65918	6.18172	2189206	1.25590	3.42109
2008	403266	1.31717	8.14235	2512001	1.14745	3.92552
2009	479858	1.18993	9.68882	2532289	1.00808	3.95723
2010	624670	1.30178	12.61272	2849777	1.12538	4.45337
2011	1008209	1.61399	20.35675	3213173	1.12752	5.02125
2012	1211777	1.20191	24.46700	3575956	1.11290	5.58817
2013	1345659	1.11048	27.17021	3325922	0.93008	5.19744
2014	1492688	1.10926	30.13887	2817416	0.84711	4.40280
2015	1608637	1.07768	32.48000	2427469	0.86159	3.79342
2016	1699312	1.05637	34.31082	2454296	1.01105	3.83535
2017	1722428	1.01360	34.77756	2513541	1.02414	3.92793

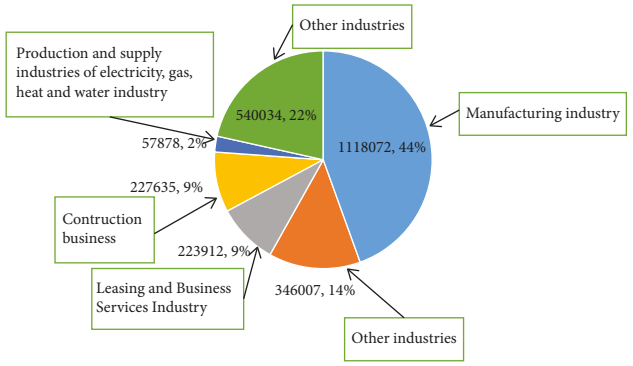

Figure 5: The portion of FDI industries in Jiangsu Province.

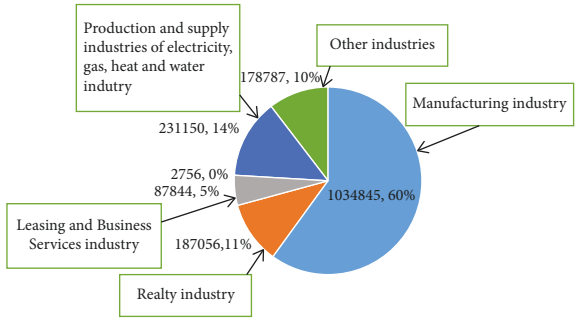

Figure 6: The portion of FDI industries in Henan Province.

The economic growth model of Jiangsu Province is as follows:

$$\ln Y_t = 0.063049 \ln FDI_t + 0.045071 \ln NE_t + 0.490681 \ln K_t + 0.223155 \ln L_t + 0.268569 \ln CPI_t + \mu_t. \quad (14)$$

It can be seen that when other variables remain unchanged, for every 1 percentage point of FDI growth, the GDP of Henan Province increased by 0.044262 percentage points, while Jiangsu Province increased by 0.063049 percentage points, and the difference between the two regions was 0.018787 percentage points. There are many reasons for this difference. From the analysis of this chapter, we can find some reasons: First of all, the distribution of FDI in Henan province is relatively uneven. FDI has been invested too much in the manufacturing industry, as high as 60%, while the manufacturing industry in Jiangsu Province is 44%, which is also due to the inconsistency between the leading industries in the two regions. Secondly, the construction industry is an important industry in promoting economic development. However, in terms of the construction industry, the FDI utilization in Jiangsu Province accounts for 9%, while the FDI introduced in the construction industry is only 0.0016%. Finally, although the growth rate of FDI introduced in Henan Province is very fast, its amount is far less than that of Jiangsu Province. Jiangsu Province has formed a relatively mature foreign joint venture, while the foreign investment in Henan Province is in the growth period, and the number of foreign direct investment cooperative enterprises is small.

4. Conclusion

Through the analysis of this paper, the study can obtain the following conclusions: First, China's FDI is mainly derived from the Hong Kong region. Second, foreign direct investment has a positive role in promoting China's economic growth but also increases China's domestic employment opportunities. Third, the distribution of foreign direct investment in various industries is very uneven, showing a situation dominated by manufacturing, leasing, and business services, and the real estate industry also accounts for a large proportion but relatively little foreign investment in education, public management, health, and social security. Fourth, in different regions, due to the regional economic law, development level is inconsistent, the introduction of FDI value is very different, and the introduction of the FDI economic benefits (i.e., GDP) because of different leading industries, so each industry introduced FDI also has different, but in each region are manufacturing most FDI. Manufacturing, leasing and business services and real estate are a large part of the FDI. These three major industries have contributed to economic growth after the introduction of FDI.

Data Availability

The dataset can be accessed upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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