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Research on the Impact of Shandong Province's FDI on Economic Growth under the Background of One Belt One Road

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Abstract

Purpose: After the reform and opening up, China's overall economic development has entered a new era. From mutual investment and trade transactions between domestic provinces and regions to investment and trade with foreign companies, the continuous supplement of investment funds makes the follow-up development of all aspects of economic development smoother and has played a strong impetus. effect. Foreign direct investment has many influences on the economic development of a country or region. **Research design, data and methodology:** This article uses the sample data of Shandong Province from 2011 to 2019 to analyze the foreign direct investment in Shandong Province by industry, region, method and other aspects, and study the relationship and influence between foreign direct investment and economic growth. **Results:** The results show that there is a relatively close relationship between foreign direct investment and economic growth, and it has played a role in promoting economic development in many aspects such as industrial structure, foreign trade, and employment. **Conclusions:** At the same time, corresponding suggestions are put forward based on the analysis and conclusions drawn.

Keywords: Douglas Production Function, Foreign Direct Investment, Economic Growth, Foreign Trade; Industrial Structure

JEL Classification Code: E44, F31, F37, G15

1. Introduction

After the reform and opening up, China's economy has developed rapidly, not only the mutual investment and trade between domestic regions, but also the attention of many foreign enterprises and businessmen. The investment has achieved remarkable results. From 2012 to 2016, our country's total amount of foreign direct investment has continued to grow steadily, ranking among the top three in the world for five consecutive years.

In recent years, the economic and trade ties between Shandong Province and the countries along the Belt and Road have been continuously strengthened, and many local enterprises have stepped out of the country. The "Belt and Road" initiative is the first successful international regional cooperation platform initiated by China, and a new "strategic measure" for international regional cooperation and growth. Shandong will play an important role in the construction of the "Belt and Road" both on the sea and on land. Shandong Province has a strong foundation for economic development and a high degree of economic opening to the outside world. Shandong Province ranks in the forefront of international trade and international investment in China, and has a certain degree of international and domestic social influence. In 2010, Shandong's agreed investment in countries along the Belt and Road was 9.75 billion yuan, an overall increase in the proportion. Among them, the target of Shandong's foreign investment is still China's surrounding areas. The fields are represented by traditional industries. The foreign investment fields include power engineering and energy cooperation.

As one of the major economic provinces in our country, Shandong Province has attracted a large amount of foreign investment by virtue of its natural environment and

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resource advantages. After the reform and opening up, more than 100 countries and regions such as South Korea and Hong Kong have invested in Shandong; in the past ten years, the scale of foreign direct investment in Shandong Province has grown relatively rapidly. In 2010, the amount of foreign direct investment in Shandong has increased to 20,515,636 US dollars. Shandong Province's ability to attract foreign direct investment is constantly improving. At this stage, Shandong Province is at a critical juncture of transformation and upgrading. For the economic growth of Shandong Province, investment is a more critical way to promote economic growth, and foreign direct investment as a part of investment, its role in promoting economic growth is also obvious.

Foreign direct investment is a way to attract foreign capital. When foreign capital flows into the domestic market to supplement capital, it will inevitably play a certain role in promoting economic development and is a good booster. Foreign direct investment will affect many aspects of Shandong's economic development. For example, the entry of foreign capital has increased the number of Sino-foreign joint ventures and Sino-foreign cooperative enterprises, providing more high-quality jobs, and has played a positive role in solving the employment problem in Shandong Province. effect. At the same time, foreign direct investment also has varying degrees of impact on Shandong's foreign trade and industrial structure optimization. Therefore, research and analysis on the relationship between foreign direct investment and Shandong's economic growth can better bring out the positive effects of foreign direct investment., thereby driving the development of the province's economy and boosting economic growth.

2. Literature review

2.1. Domestic literature review

Xin Dejun (2014) used panel data analysis methods to research and analyze the impact of foreign direct investment on the upgrading of China's industrial structure, and concluded that the impact of foreign direct investment on China's industrial structure is more significant, and the effect is relatively strong. Regular changes. After the industrial structure is optimized, it will naturally play a positive role in promoting my country's economic development.

Liu Hong and Li Shusheng (2013) used time data from 1985 to 2010 and established a VAR model on the basis of econometrics to conduct a quantitative analysis of FDI, economic growth and employment, and finally show that foreign direct investment contributes to economic growth and employment. The situation has played a role in promoting, and at the same time, the good economic growth has attracted more foreign investment from other countries to China, which has played a role in mutual influence.

Wang Shanshan (2020) studied the trade effect of two-way FDI in Shandong Province. Using data from Shandong Province in the past 28 years, it was found that in the long term, the trade effect of IFDI is manifested in export creation and import substitution, and OFDI is manifested in export creation and import creation effects.

Zhang Yunhui and Zhang Kai (2007) collected China's import and export trade data for a total of 24 years up to 2014, and econometric analysis found that the trade substitution effect of investment is widespread.

Zhao Jianing (2020) found that FDI in the long-term is manifested as a trade creation effect, and the GDP of the countries along the route and China's direct investment flow and stock are all positively correlated with the total bilateral trade, indicating that the market scale and the expansion of their investment scale in the countries along the route are positive. Feedback in trade to achieve "bundled" growth. Among them, GDP has the greatest impact, indicating that its increase is the foundation of the deepening of national trade; the effect of FDI stock in trade development creates economy is obviously greater than that of flow, which means that FDI has a stronger long-term cumulative impact on trade, which is further objectively confirmed the importance of the areas along the route to the development of my country's foreign trade.

It can be seen that many Chinese scholars have used Chinese data to conduct empirical analysis and research on the relationship between foreign direct investment and economic growth. The main research directions are the relationship between foreign direct investment and economic growth, the influencing factors of foreign direct investment, etc., commonly used research The methods are linear regression analysis, Granger causality test, VAR model, etc. The final conclusions are basically the same. Through studying the various aspects of the impact of foreign direct investment, such as the promotion of employment by foreign direct investment, the optimization and reform of industrial structure, the promotion of foreign trade, etc., they ultimately played a positive role in promoting economic growth.

2.2. Review of foreign literature

Romer (1986) and Lucas (1988) obtained the conclusion verification that foreign direct investment promotes the economic growth of a country or a region through the application of the "new economic growth theory". The post-Keynesian theory is based on Keynes' "effective

demand" and examines the impact of a country or region's long-term stable and sustained income growth on economic growth.

Harrod's (1939) economic growth model pointed out that increased investment will lead to economic growth. This investment can come from one country or another. Therefore, foreign direct investment is an effective way to achieve economic growth.

Mundell (1957) proposed a theoretical model of trade and investment based on the Samuelsen H-O-S model. He believes that in the context of national economic and trade barriers, in order to complete the complete replacement of commodity export trade, the realization condition is that FDI is based on the lowest factor conversion cost, and trade barriers will be negative trade to stimulate investment and promote capital flows.

Kojima (1987) combined comparative advantage on the basis of Mundell and pointed out that when a country exports products with comparative advantages, it can import products invested by the country that are losing its comparative advantage, thereby promoting the development of two-way trade. Moreover, in direct investment, there is not only the movement of capital, but also the transfer of production factors such as technology and labor, thus accelerating the growth of one country's trade, and also enabling another country to use advantageous industries to increase the sales of the industry, which has a complementary effect.

Through research, it can be seen that most foreign scholars and economists believe that foreign direct investment can positively promote the economic growth and industrial structure optimization of the host country.

3. The Status Quo of Foreign Direct Investment in Shandong Province

Shandong Province is a large coastal open economic province located in the eastern economically developed zone. Since the reform and opening up, the impact of foreign direct investment on the economic development of Shandong Province has been deepening. Shandong Province has also made remarkable achievements in the process of opening up to the outside world.

During the period 2006-2019, Shandong Province has accumulated 448,435 foreign direct investment contract projects; the accumulated amount of foreign direct investment actually used in the projects is US$1.55031 billion; the accumulated amount of foreign investment actually used is US$1.569915 billion. As can be seen from the above figure (data from Shandong Provincial Bureau of Statistics), the amount of FDI in Shandong Province has basically shown an increasing trend year by year. With the continuous expansion of foreign direct investment, foreign-funded enterprises have always been the main form of its development. The main areas where Shandong Province utilizes foreign direct investment are concentrated in the eastern coastal areas, and the industrial structure is dominated by the secondary and tertiary industries.

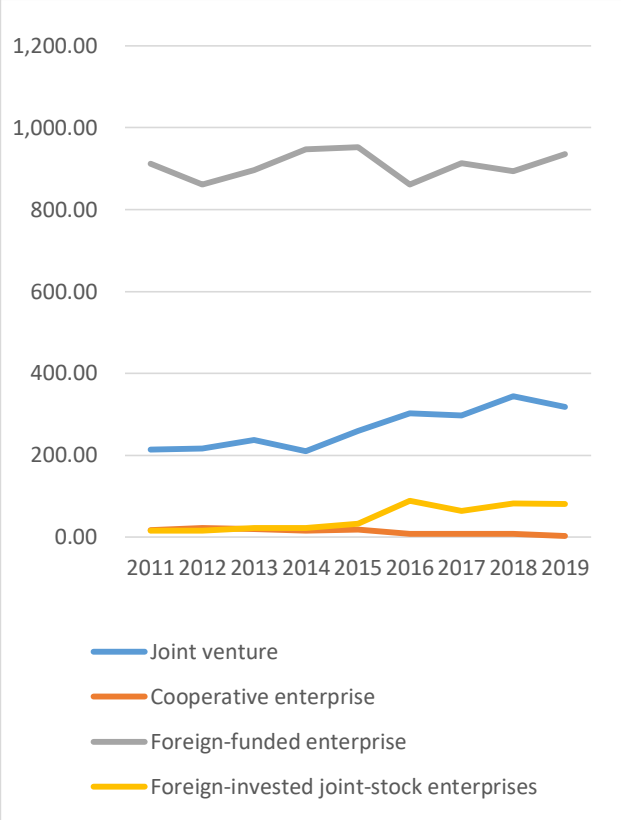
Table 1: 2006-2019 Foreign Direct Investment in Shandong Province

Year	Foreign Direct Investment Contract Projects (a)	Actual Use of Foreign Direct Investment Amount (100 million US dollars)	Actual Amount of Foreign Capital Used (100 million US dollars))
2006	41473	658.21	698.76
2007	37871	747.68	783.39
2008	27514	923.95	952.53
2009	23435	900.33	918.04
2010	27406	1057.35	1088.21
2011	27712	1160.11	1176.98
2012	24925	1117.16	1132.94
2013	22773	1175.86	1187.21
2014	23778	1195.62	1197.05
2015	26575	1262.67	1262.67
2016	27900	1260.01	1260.01
2017	35652	1310.35	1310.35
2018	60533	1349.66	1349.66
2019	40888	1381.35	1381.35

Data source: Statistical Yearbook of Shandong Province

3.1. The method of foreign direct investment in Shandong Province

The method of foreign direct investment in Shandong Province is mainly composed of joint ventures, cooperative enterprises, foreign-funded enterprises and foreign-invested joint-stock enterprises. In terms of the amount of foreign investment, foreign-funded enterprises have always been in a dominant position, and joint ventures have also shown a gradually increasing trend.

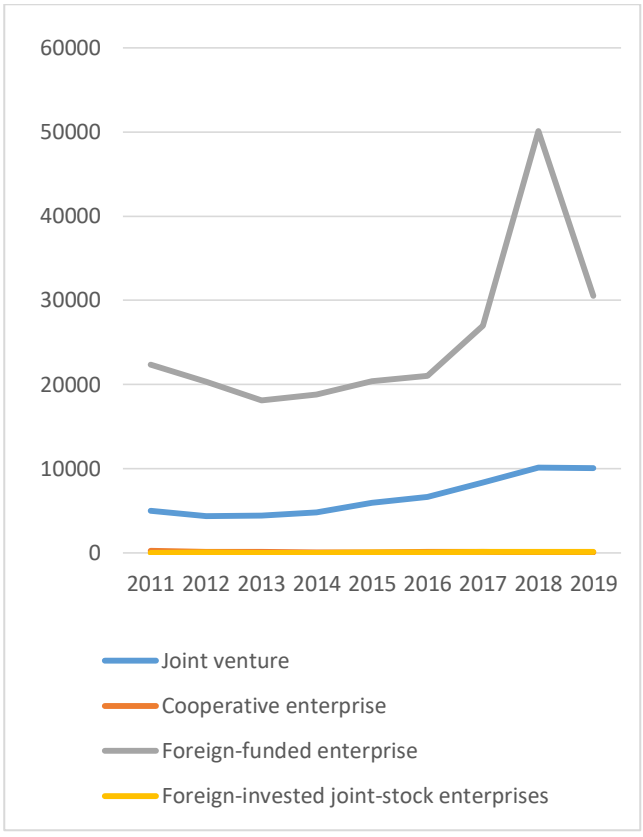


Data source: Statistical Yearbook of Shandong Province

Figure 1: The actual use amount of foreign direct investment by method from 2011 to 2019

In 2011, the actual use of foreign capital by foreign-funded enterprises was US$91.205 billion, accounting for 78% of the total foreign direct investment; in 2015, foreign-funded enterprises used US$95.285 billion and the total foreign direct investment in 2019 reached US$138.135 billion.

In terms of the number of foreign direct investment contract projects, joint ventures and foreign-funded enterprises occupy a dominant position, and they have basically shown an upward trend year by year. In 2011, the number of joint venture contracts accounted for 18% of the total, and foreign-funded enterprises accounted for 80% of the total; in 2019, the number of joint venture contracts accounted for 24.7% of the total, and foreign-funded enterprises accounted for 75% of the total.



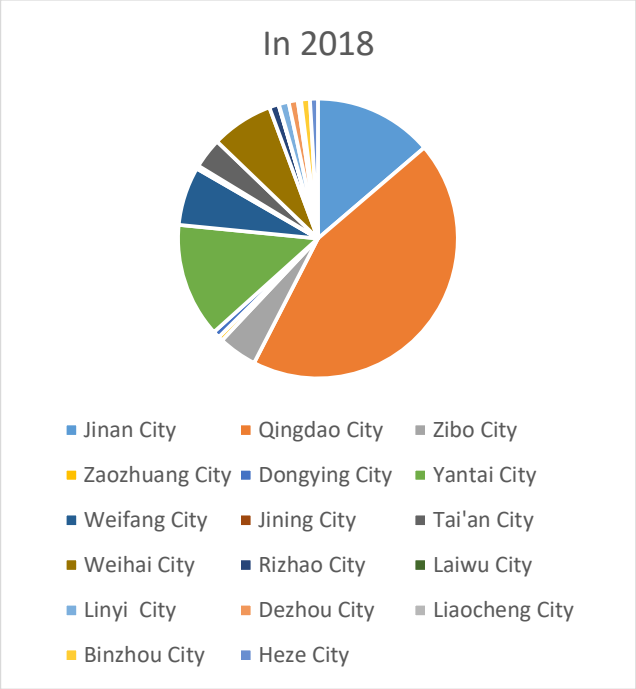
Data source: Statistical Yearbook of Shandong Province

Figure 2: The situation of foreign direct investment contract projects in 2011-2019

3.2. The use of foreign direct investment in each city in Shandong Province

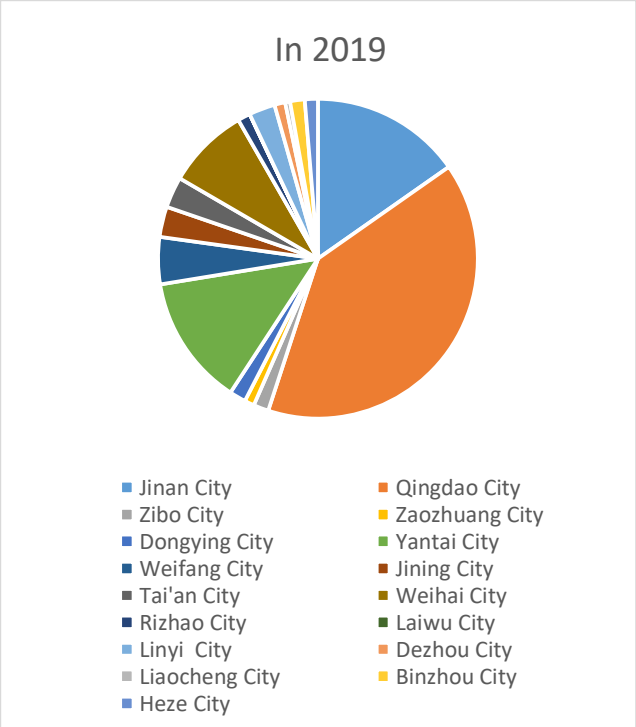
There are very obvious differences in the use of foreign direct investment in Shandong Province, most of which are concentrated in the eastern coastal areas.

As can be seen from the data in the above figure, most of the use of foreign direct investment occurred in Qingdao, Jinan and Yantai. In the 2018 foreign direct investment data, Qingdao's use of FDI accounted for 42.37% of the province's total, and the combined amount of Qingdao, Jinan, and Yantai accounted for about 69% of the province's total; in 2019, the combined amount of Qingdao, Jinan, and Yantai It accounts for 68% of the province's total. The sum of the three cities basically remained at more than half of the total.



Data source: Statistical Yearbook of Shandong Province

Figure 3: Utilization of foreign direct investment by cities in Shandong Province in 2018

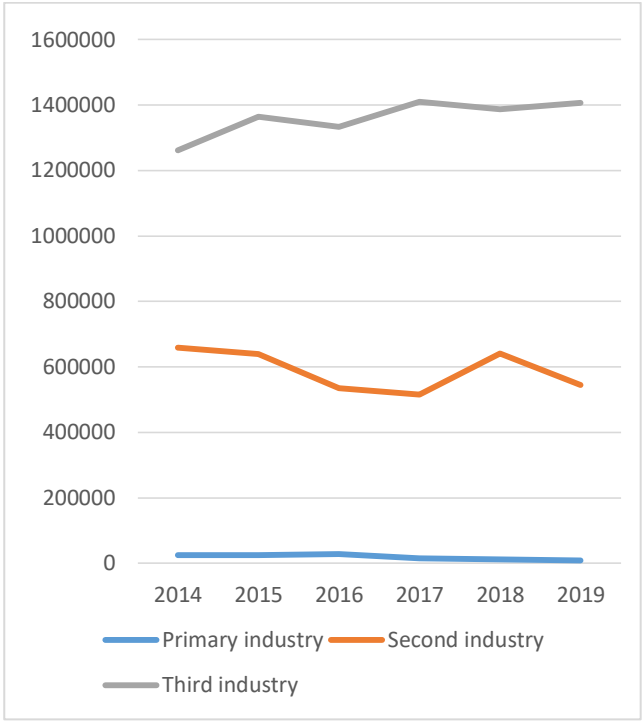


Data source: Statistical Yearbook of Shandong Province

Figure 4: Utilization of foreign direct investment by cities in Shandong Province in 2019

3.3. Foreign Direct Investment in Various Industries in Shandong Province

Foreign direct investment in Shandong Province has a very obvious industry agglomeration effect. The tertiary industry is basically the industry that uses the most foreign capital in Shandong Province, followed by the secondary industry.



Data source: Statistical Yearbook of Shandong Province

Figure 5: The use of foreign direct investment by industry in Shandong Province from 2014 to 2019

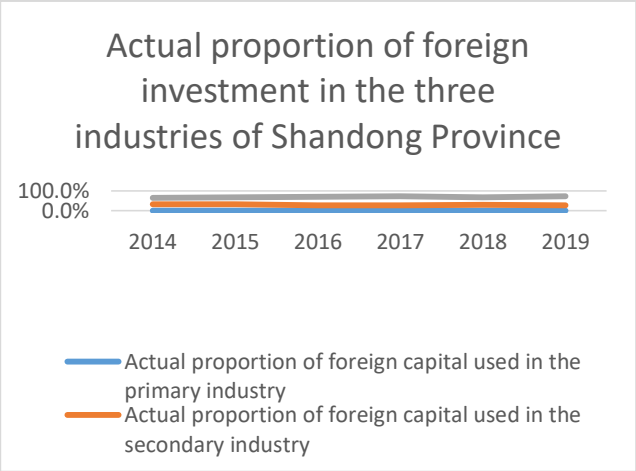
Table 2: The use amount of foreign direct investment by industry in Shandong Province from 2014 to 2019

	Primary Industry	Second Industry	Third Industry
2014	24781.3	659323.8	1262264
2015	24626.9	638780.7	1363864.3
2016	28569.9	535787.9	1332596.9
2017	15920.5	515539.1	1409284.1
2018	12109.1	640774.6	1386677
2019	8144.2	544475.8	1406278.6

Data source: Statistical Yearbook of Shandong Province

In 2014, the proportion of the primary industry, the secondary industry, and the tertiary industry accounted for 1.3%, 33.9%, and 64.9% of the actual foreign capital actually used; in 2019, the proportion of the secondary

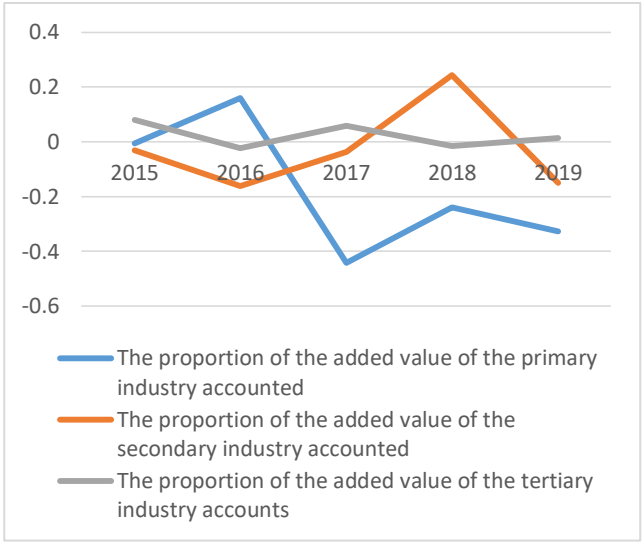
industry was slightly higher than that of previous years Decline, the amount and proportion of foreign capital utilized by the tertiary industry have maintained a relatively stable growth trend.



Data source: Statistical Yearbook of Shandong Province

Figure 6: The proportion of foreign capital actually used in Shandong's tertiary industry from 2014 to 2019

The above figure is obtained by collating the actual use of foreign capital in the primary, secondary, and tertiary industries. Compared with the secondary and tertiary industries, the use of foreign capital in the primary industry is almost negligible. In the secondary and tertiary industries, the tertiary industry's use of foreign capital is basically more than half of the total amount of foreign capital, and most foreign businessmen invest in the tertiary industry. This makes the tertiary industry the main development trend of the industrial structure of Shandong Province.



Data source: Statistical Yearbook of Shandong Province

Figure 7: The proportion of the added value of the tertiary industry in Shandong Province from 2015 to 2019

From 2011 to 2019, the foreign direct investment in Shandong Province basically showed a trend of increasing year by year. From the above figure, we can see that the value-added of the primary industry has shown a negative increase for most of the past ten years. The secondary industry and the tertiary industry During the same period, it basically showed a state of positive increase, and the industrial structure gradually transitioned from the primary industry to the development structure with the secondary and tertiary industries as the dominant development trend.

Table 3: The proportion of foreign capital used in the tertiary industry in 2014 and 2019

Industry	Industry	Utilization Ratio of Foreign Investment (2014))	Utilization Ratio of Foreign Investment (2019)
Primary Industry	The Whole Industry	0.013	0.004
Second Industry	The Whole Industry	0.339	0.272
	Manufacturing Industry	0.334	0.256
Third Industry	The Whole Industry	0.649	0.724
	Transportation, Warehousing, and Postal Industry	0.037	0.033
	Wholesale and Retail Industry	0.079	0.066
	Financial Industry	0.034	0.039
	Real Estate Industry	0.290	0.170
	Leasing and Business Services	0.104	0.160
	Scientific Research and Technology Services	0.027	0.081

Data source: Statistical Yearbook of Shandong Province

From the perspective of sub-industries, almost all of the foreign capital in the secondary industry flows to the manufacturing industry. The main reason for the decline in the proportion of foreign capital actually used by the secondary industry is that the proportion of The 33.4% in 2014 dropped to 25.6% in 2019, a drop of nearly 10 percentage points. The manufacturing industry is divided into light and textile industries (food, textile, printing, etc.), resource processing industries (petrochemical, pharmaceutical manufacturing, etc.), and machinery and electronics manufacturing (machine tools, mechanical equipment, etc.). The high-tech industries use foreign capital each year. The rise shows that the structure of the manufacturing industry's utilization of foreign capital is continuously optimizing. Within the tertiary industry, the proportion of foreign investment used in leasing and business services, scientific research and technical services has increased significantly, indicating that the structure of the tertiary industry's use of foreign capital is also continuously optimized, and it is more biased towards service and technology industries.

4. An Analysis of the Effect of Foreign Direct Investment on Shandong's Economic Growth

4.1. The positive effects of foreign direct investment

The amount of foreign direct investment in Shandong Province has been increasing in the past 15 years, from 63.021 billion U.S. dollars in 2006 to 138.13 billion U.S. dollars in 2019; the number of newly established foreign-funded enterprise projects increased from the least 23,435 in 2009 to the most in 2018 Of 60533. The continuous increase of newly established enterprise projects has provided more jobs. At the same time, due to the particularity of foreign-funded enterprises, the ability and academic qualifications of employees are relatively high, which indirectly improves the ability and quality of employees. The employment and economic development of the province play a certain potential role in promoting.

After the reform and opening up, the scale of foreign direct investment in Shandong Province has continued to expand, and the amount of foreign direct investment has shown an increasing trend year by year. Foreign direct investment has a relatively obvious pulling effect on the volume of import and export trade. Shandong Province has an advantageous geographical location, rich natural resources and labor resources, and gradually expands the volume of import and export trade through the combination with high-tech industries and effective marketing methods. At the same time, the import and export trade of Shandong Province is closely related to South Korea and Japan, contributing a relatively high volume of trade. The continuous establishment of foreign-funded enterprises has also expanded the overall scale of Shandong's foreign trade; from 2006 to 2019, Shandong's imports and exports have basically shown a trend of year-on-year growth.

Table 4: 2006-2019 FDI and import and export trade volume in Shandong Province

Year	FDI (US $100 million))	Import Amount (US $100 million)	Exports Amount (US $100 million)
2006	630.21	7914.6	9689.8
2007	747.68	9561.2	12204.6
2008	923.95	11325.7	14306.9
2009	900.33	10059.2	12016.1
2010	1057.35	13962.4	15777.5
2011	1160.11	17434.8	18983.8
2012	1117.16	18184.1	20487.1
2013	1175.86	19499.9	22090
2014	1195.62	19592.3	23422.9
2015	1262.7	16795.5	22734.7
2016	1260	15879.3	20972.3
2017	1310.4	18437.9	22633.5
2018	1349.7	21357.3	24866.8
2019	1381.3	20784.1	24994.8

Data source: Statistical Yearbook of Shandong Province

4.2. Negative effects of foreign direct investment

In the past decade or so, the number of newly established foreign-funded enterprises in Shandong Province has gradually increased, which will inevitably provide more excellent jobs, but the number of employed foreign-funded enterprises has been declining year by year. Most foreign-funded enterprises will have more foreign business and foreign trade business, which puts forward better requirements on the ability and academic qualifications of employees. The number of employees is reduced, but the quality is improved. At the same time, in order to have a better development, the company will inject fresh blood into the interior, recruit and introduce excellent talents, so it will lay off or implement the elimination system internally. Although the replacement of employees has played a positive role in the development of enterprises, it has caused the unemployment rate to fall.

There are obvious spatial differences in the actual utilization of foreign capital in Shandong Province, most of which are concentrated in the eastern coastal areas. More than the general foreign direct investment use occurred in Qingdao, Jinan and Yantai. Jinan is the capital city of the province, while Qingdao and Yantai are coastal cities, both of which are ranked high in the province's economic development; the actual use of foreign capital in the three cities in 2019 reached 68% of the province's foreign capital, resulting in the division of the remaining ten cities 32% of the amount of foreign investment. This phenomenon can easily lead to uneven economic development in the province. The eastern coastal areas are relatively developed, and the economic development of other inland cities is relatively slow. The economic gap between various regions in Shandong Province has widened, which will ultimately affect the overall economic development of the province.

The situation of foreign direct investment in Shandong Province has played a certain role in hindering the upgrading and optimization of the industrial structure. The use of foreign capital in the three major industries in Shandong Province is very unbalanced, with the secondary industry and the tertiary industry as the leading industry, and the primary industry's added value showing a negative increase. The world economy is developing at a rapid level and the high-tech industries are constantly advancing. It is correct to vigorously develop emerging technology industries, but the development of the primary industry cannot be abandoned. Shandong Province has an advantageous geographical location and abundant natural resources. The neglect of the development of the primary industry will lead to the waste of good natural resources. The secondary industry intensively develops the manufacturing industry, the real estate industry and the service industry in the tertiary industry account for a relatively large proportion, and the development of the primary industry is at the end. The unbalanced development of the three major industries will make industrial optimization and upgrading more difficult.

5. An Empirical Analysis of the Relationship between Foreign Direct Investment and Economic Growth in Shandong Province

5.1. Variable selection and model establishment

This article uses Douglas production function as the base for empirical analysis. Solow's Douglas production function is often used to analyze the effect of foreign direct investment on the economic growth of the host country. Economic growth depends on three key elements, namely capital increase, technological progress and labor input, while foreign direct investment can be regarded as an effective capital inflow and has a positive impact on economic growth.

The model based on Douglas production function is:

Among them, Y stands for GDP, which represents the economic development level of Shandong Province.

K represents capital increase and is expressed by the scale of foreign direct investment in Shandong Province.

L stands for labor input, expressed by the number of employed population in Shandong Province.

A stands for technological progress, and it is a fixed constant, which is referred to as the random interference term in this article.

In order to eliminate heteroscedasticity and make the data series more stationary, the model obtained by taking the logarithm of both sides is:

5.2. Model data and description

The data used in this article are from the Shandong Provincial Statistical Yearbook and the China Statistical Yearbook. The exchange rate of RMB against the US dollar is used to convert the gross national product, and the FDI and GDP units are unified. Regression analysis adopts Eviews 3.0 version.

Table 5: Statistics of FDI and Economic Growth in Shandong Province from 2005 to 2019

Year	GDP（100 million yuan）	FDI（100 million yuan）	Employment Population（ten thousand person）	The RMB Exchange Rate
2005	15947.51	733.78	5840.7	8.1797
2006	18967.8	797.24	5960	7.9718
2007	22718.06	837.32	6081.4	7.604
2008	27106.22	569.67	6187.6	6.9451
2009	29540.8	547.17	6294.2	6.831
2010	33922.49	620.65	6401.9	6.7695
2011	39064.93	720.82	6485.6	6.4588
2012	42957.31	779.76	6554.3	6.3125
2013	47344.33	870.34	6580.4	6.1932
2014	50774.84	933.41	6606.5	6.1428
2015	55288.79	1015.29	6632.5	6.2284
2016	58762.46	1124.25	6649.7	6.6423
2017	63012.1	1205.69	6560.6	6.7518
2018	66648.87	1357.65	6180.6	6.6174
2019	71067.53	1013.08	5987.9	6.8967

Data source: Shandong Statistical Yearbook, China Statistical Yearbook
Take the logarithm of the data to get:

Table 6: Statistics on FDI and Economic Growth of Shandong Province from 2005 to 2019 (after taking the logarithm)

Year	Ln(GDP)	Ln(FDI)	Ln(LABOR)
2005	9.677058	6.598209	8.672606
2006	9.850498	6.681156	8.692826
2007	10.03092	6.730206	8.71299
2008	10.20752	6.345057	8.730303
2009	10.29353	6.30476	8.747384
2010	10.43183	6.430767	8.76435
2011	10.57298	6.580389	8.77734
2012	10.66796	6.658986	8.787877
2013	10.7652	6.768884	8.791851
2014	10.83516	6.838845	8.795809
2015	10.92033	6.92293	8.799737
2016	10.98126	7.024871	8.802327
2017	11.05108	7.094807	8.788837
2018	11.10719	7.213511	8.729171
2019	11.17139	6.92075	8.697496

Data source: Eviews 3.0

5.3. Regression analysis

Based on the model: OLS analysis of the relationship between foreign direct investment and economic growth in Shandong Province based on the data in Table 6. The various values after the model regression can clearly analyze the positive and negative effects of foreign direct investment on the economic development of Shandong Province.

The linear regression analysis with Eviews 3.0 is as follows:

R^2=0.687969 $R^{2\,ADJ}$ =0.635964 F =13.22885

The model R-square value is 0.688, which means that LN (FDI) and LN (LABOR) can explain 68.80% of the change in LN (GDP). When the F test was performed on the model, it was found that the model passed the F test (F=13.229, p=0.001<0.05), which means that at least one of FDI and

labor input will have an impact on GDP. The final specific analysis shows that:

The regression coefficient value of LN(FDI) is 1.031, and it is significant at the 0.01 level (t=3.539, p=0.004<0.01), which means that FDI will have a significant positive impact on GDP. The regression coefficient of Ln (LABOR) is 5.100, and it shows significance at the 0.05 level (t=2.873, p=0.014<0.05), which means that labor input will have a significant positive impact on GDP.

The model formula is:
LN(GDP)=
-41.02151+1.031007*LN(FDI)+5.100407*LN(LABOR)

Table 7: Regression analysis results of the relationship between FDI and economic growth in Shandong Province

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-41.02151	15.23139	-2.693222	0.0196
LN(FDI)	1.031007	0.291328	3.538994	0.0041
LN(LABOR)	5.100407	1.775154	2.873220	0.0140
R-squared	0.687969	Mean dependent var		10.57093
Adjusted R-squared	0.635964	S.D. dependent var		0.472388
S.E. of regression	0.285017	Akaike info criterion		0.504323
Sum squared resid	0.974819	Schwarz criterion		0.645933
Log likelihood	-0.782425	F-statistic		13.22885
Durbin-Watson stat	0.612635	Prob(F-statistic)		0.000923

Data source: Eviews 3.0

5.4. Regression result test

5.4.1. Correlation verification

It can be seen from the below table that the correlation coefficient between LN (GDP) and LN (LABOR) is 0.602, and it shows a significant level of 0.05, which shows that there is a significant positive correlation between GDP and labor input. The correlation coefficient between LN (GDP) and LN (FDI) is 0.688, and it shows a significant level of 0.01, which shows that there is a significant positive correlation between GDP and FDI.

Table 8: Correlation verification results

	Ln(GDP)
Ln(FDI)	0.688
Ln(LABOR)	0.602

5.4.2. Heteroscedasticity test

Two methods of White test and BP test are used for testing. Test the null hypothesis that the model has no different parties

The below table shows that both tests accept the null hypothesis (p>0.05), indicating that the model does not have the problem of heteroscedasticity.

Table 9: Heteroscedasticity test results

White Heteroscedasticity Test		BP Test	
X^2	P	X^2	P
8.313	0.140	6.714	0.035

5.5. Analysis result

The regression analysis results show that: Shandong's foreign direct investment has a direct stimulating effect on economic development. Through modeling, it can be known that after taking the logarithm of the data, the regression coefficients of LN (GDP) and LN (FDI) are positive, indicating that there is a positive correlation. The continuous expansion of the amount and scale of foreign direct investment has played a positive role in promoting the economic development of Shandong Province.

6. Conclusions and policy recommendations

6.1. Conclusions

The number of newly established foreign-funded enterprises in Shandong Province is constantly increasing. Joint ventures and foreign-funded enterprises attract foreign capital and actually use foreign capital that dominate and basically show an increasing trend. This phenomenon has provided Shandong Province with more high-quality jobs, and the requirements for employees are increasing. Although the number of employees has not increased significantly, the quality has been improved. The positive development of Shandong Province has potential and long-term positive impetus.

Shandong's foreign direct investment has a relatively direct impact on Shandong's foreign trade. Through linear regression analysis, the increase in FDI has a significant

positive impact on Shandong's imports and exports, and has a significant impact on Shandong's imports and exports. Stable balance and promote relationships.

The amount of foreign capital actually used in the secondary and tertiary industries in Shandong Province has far exceeded that of the primary industry, and the amount used in the tertiary industry is also significantly higher than that of the secondary industry. This shows that the tertiary industry in Shandong Province is developing rapidly, with more foreign investment in the tertiary industry, especially high-tech industries and service industries. In recent years, the tertiary industry, dominated by technology industry and service trade, has continued to develop, and the proportion of foreign capital used has been increasing, attracting more and more foreign capital.

6.2. Policy recommendations

Based on the above analysis, it can be seen that foreign direct investment directly or indirectly promotes the economic growth of Shandong Province, but there are also some unavoidable problems. Therefore, the following suggestions are put forward.

Foreign direct investment in Shandong Province has shown a steady growth trend in the past ten years, but the employment rate has not shown a synchronized growth trend. The increase in the number of newly established foreign-funded enterprises will inevitably provide more jobs. However, due to the particularity of the business, not everyone is competent for the job positions of the enterprises, and even higher requirements for abilities and academics are put forward for the required employees. In terms of the overall economic development trend of the enterprise itself, it is reasonable and reasonable to increase the rigid requirements for employees or enterprise employees, and it can even be said to be inevitable, because the development of enterprises and even the economy needs talents. At the same time, this has also led to the emergence of enterprise personnel selection and even elimination. However, the decline in the employment rate and the rise in the unemployment rate will not have a positive effect on economic development. Therefore, companies can provide early entry training for jobs that require technical content, thereby increasing the entry rate and employment rate of the job. At the same time, companies can also train their employees on a regular basis to improve their abilities and knowledge, instead of choosing to eliminate employees with insufficient capabilities. This will reduce the unemployment rate and cultivate more professional talents. The increase in employment rate will bring about an increase in per capita income, and then achieve the ultimate goal of economic growth.

Foreign direct investment has played a positive role in promoting Shandong's import and export trade. The advantage lies in exporting Shandong's abundant resources and importing Shandong's scarce resources. In order to further promote the import and export trade of Shandong Province, it is necessary to increase the intensity of attracting foreign investment. At present, there is a certain degree of immobilization in the flow of foreign capital, and the imported or exported products are almost unchanged. Second, increasing the intensity of attracting foreign capital can introduce foreign capital into industries or products where trade is not very frequent, which can expand foreign trade. Product Range. At the same time, it strengthens ties with large-scale countries such as Japan and South Korea that account for a large proportion of foreign investment in Shandong Province. With the excellent cooperation of countries that guarantee large-scale foreign investment, we will develop new investment countries and increase the inflow of foreign capital to the source countries, so as to promote the effective development of Shandong Province's economy.

The tendency of foreign direct investment in Shandong Province is relatively significant. Therefore, when introducing and using foreign capital, it is necessary to consider the current industrial structure and the trend of future industrial structure adjustment. At present, the proportion of foreign capital actually used in the primary industry is very low, and the secondary and tertiary industries have overwhelming advantages. Although high-tech industries and service industries are currently hot industries for development, the primary industry cannot be completely abandoned. Shandong Province is relatively rich in natural resources, and the output of agricultural products is not low. Enterprises in the primary industry can introduce technologies from the secondary and tertiary industries into agriculture, which improves farming efficiency and increases the output of agricultural products. Excessive processing and promotion can also make it sell to other countries and promote the import and export trade of Shandong Province. This is also in line with the factor endowment theory; it can also solve the employment problem of township people and promote the development of township enterprises. Poverty alleviation is now also our country's overall development goal. The introduction and integration of the advantages of different industries can achieve the goal of multiple problems at the same time. Using the technology of the secondary and tertiary industries to drive the development of the primary industry means that the entire industrial structure will no longer have two extreme phenomena. It will optimize the industrial structure and make it develop in an overall coordinated and orderly manner. Only in this way can we better contribute to the economic growth of Shandong Province.

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