

# Research on Employment Effect of FDI in Service Industry in Jiangsu Province

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**Abstract:** In recent years, the global foreign direct investment (FDI) has shown a “service-oriented” trend, and the labor force has gradually begun to flow to the service industry. Introducing FDI into service industry can not only absorb part of employment with its job-creation effect, but also promote the improvement of employment quality. Under the guidance of market demand and the government, the proportion of FDI in China's service sector has gradually increased, and the service sector and service trade have become a new driving force for China's economic growth. The development of service industry in Jiangsu province has always been in a leading position in China. Meanwhile, Jiangsu province is also one of the main provinces where labor force gathers. Therefore, it is of theoretical and practical significance to study the employment effect of FDI in service industry in Jiangsu Province for relieving employment pressure and promoting the efficient use of FDI. This study firstly combs the relevant literature at home and abroad, which is divided into two aspects of employment quantity and employment quality. On this basis, the paper analyzes the mechanism of service FDI's influence on employment from these two levels and constructs the theoretical basis of this study. Secondly, this study analyzes the current situation of FDI and employment in service industry in Jiangsu Province. Then, empirical analysis is made on the data of Jiangsu province from 2007 to 2020, and the conclusion is drawn that FDI in service industry in Jiangsu Province can not only promote the increase of employment quantity in service industry, but also promote the improvement of employment quality in service industry. Based on the above analysis, this study puts forward relevant suggestions on how to make more efficient use of FDI to drive employment effect in Jiangsu province.

**Keywords:** Service industry, Foreign direct investment, Employment, Jiangsu province.

## 1. Introduction

The development strength of China's service industry has been increasing, playing the role of "stabilizer" in economic growth and employment, and the service industry has become the industry that absorbs the most employment in China, and the level of development of the service industry can well measure the level of development of a country's economy as a whole and the degree of prosperity of the regional economy. Since the 18th National Congress, China's service industry has been developing rapidly in an all-round way, and its scale has been increasing continuously, occupying half of the national economy. At the same time, foreign enterprises have also seen the prospect of China's service trade development and the real service demand brought by China's accelerated urbanization, and they have promptly adjusted their investment strategies and started to shift their investment focus to the tertiary industry, which has contributed to the rapid development of China's service industry and service trade.

As one of China's major economic provinces, Jiangsu Province has unique advantages in terms of economy, geographic location and resources, and is one of the most important provinces in attracting FDI inflows. 1985 FDI in Jiangsu Province amounted to 11.91 million U.S. dollars, and in 2022 FDI in Jiangsu Province will be as high as 28.38 billion U.S. dollars, which shows that Jiangsu Province has made significant achievements in the introduction of foreign capital. In addition, the distribution composition of FDI in the three industries has also changed greatly, and the three-industry composition ratio of FDI in Jiangsu Province has developed from 0.006:0.826:0.168 in 2006 to 0.01:0.53:0.46 in 2019, and the change in the composition ratio indicates that

the tertiary industry in Jiangsu Province has become the key investment object of FDI. At the same time, the number of employment in Jiangsu Province has also changed dramatically, with the number of employment in the tertiary industry growing from 15,275,500 in 2006 to 22,358,600 in 2019. Vigorously developing the service industry is not only the need of economic development in Jiangsu Province, but also the need to solve the employment problem. Therefore, this paper takes Jiangsu Province as an example, in-depth analysis of the impact of foreign direct investment on the employment of the service industry is of value and significance, through the analysis of the difference in the impact of foreign investment on the employment of the service industry, which will help the relevant organizations to be able to reasonably and fully utilize the foreign investment, to match the development of the current new normal of China's economy with its advantages, and to promote further development of the service industry to contribute to the stabilization of China's employment market.

## 2. Theoretical Analysis

### 2.1. Impact of foreign direct investment on the volume of employment in the service sector

#### 2.1.1. Employment creation effects

The employment creation effect refers to the fact that FDI in services can increase the number of jobs in the industry. First, foreign investment in services creates new enterprises, which directly increases the demand for employment in services. In addition, due to the internationalization of the geographical division of labor, many foreign-funded enterprises do not directly build factories in the host country,

but will cooperate with domestic enterprises through the form of service outsourcing, this way will also increase the demand for employment. Secondly, investment has a multiplier effect; foreign-funded enterprises enter the service sector to carry out a series of investment activities, and the increase in investment works through the multiplier effect to promote the economic growth of the host country, thus indirectly increasing the demand for employment in the labor market.

### **2.1.2. Employment crowding-out effect**

The employment crowding-out effect refers to the fact that the entry of foreign investment into services can have a crowding-out effect on domestic firms in the industry. If foreign direct investment and host country domestic investment duplication, that is, foreign direct investment into the host country's existing competitive industries, based on the advanced management experience and technology level of foreign direct investment enterprises, foreign direct investment will contribute to the host country's market competition is fierce, which leads to the weaker host country enterprises to reduce investment or even withdraw from the market, the foreign-funded enterprises will be crowded out of the host country's market share and thus indirectly inhibit the host country's Employment.

### **2.1.3. Employment transfer effect**

Employment transfer effect, refers to foreign enterprises and domestic service enterprises in production or facing closure state of joint venture or cooperation, so that the injection of foreign capital revitalization of these domestic enterprises, in a sense, the transfer of the previously unemployed employees. This form does not directly increase the demand for employment, but the transfer of the original employment, that is, the transfer effect<sup>[1]</sup>.

In summary, the employment creation effect and the employment transfer effect can have a positive effect on employment, and the employment crowding out effect can have a negative effect. Therefore, if the creation and transfer effects add up to more than the crowding out effect, the net effect is positive, and vice versa.

## **2.2. The impact of foreign direct investment on the quality of employment in the service sector**

Employment quality is usually measured by indicators such as "wage income", "labor productivity", "working environment", etc. FDI in services can usually affect the quality of employment in the following two ways.

### **2.2.1. Correlation effect**

Generally speaking, the technical level of industries with FDI inflows is relatively high, which puts higher requirements on producers and suppliers upstream and downstream of the industry. In order to meet the standards, workers are usually provided with technical training and sharing of management and service experience, which can greatly promote the improvement of labor productivity. For service industries, FDI inflows can bring high-quality service products, and high-quality services can also enhance the productivity of host country firms, such as accounting and consulting industries. Therefore, the linkage effect contributes to the improvement of the overall technological level of the industry and enables host country firms to actively participate in the international division of labor, thus promoting the transformation of the industry from labor-intensive to capital-intensive and thus improving the quality

of local employment.

### **2.2.2. Technology spillovers**

The generation of technology spillover effect relies on two ways: first, due to the entry of foreign enterprises, foreign enterprises and host country enterprises compete for limited market resources, market competition intensifies, stimulating host country enterprises to use the existing resources more effectively, thus promoting the improvement of the technical efficiency of host country enterprises; secondly, the host country originally has a strong industry barriers to the industry, due to transnational corporations to force their way into the market to a certain extent, eliminating market monopoly and enhancing market competition, so that resource allocation can be optimized and the level of social welfare can be improved. Secondly, the host country originally had strong industry barriers, due to the forced entry of transnational corporations, to a certain extent, the elimination of market monopoly, enhanced market competition, thus optimizing the allocation of resources, and improving the level of social welfare.

## **3. Empirical Analysis of the Quantitative Effects of FDI Employment in the Service Sector in Jiangsu Province**

### **3.1. The Impact of FDI in the Service Sector on the Number of Employed in the Service Sector in Jiangsu Province**

#### **3.1.1. Empirical method**

In order to study the relationship between FDI in the service industry and the number of employment, the data selected in this paper are time series, which are non-stationary series, firstly, the time series should be tested for smoothness, and if the time series is smooth, then the correlation analysis between the variables can be carried out, and this study adopts the Johansen cointegration test to prove the correlation of the variables, but the cointegration test only reflects the cointegration relationship between the variables, therefore, the Granger non-causality test still has to be carried out to test whether there is a causal relationship among variables. Granger non-causality test is needed to test whether there is a causal relationship between variables. In the empirical process, this study uses Eviews8 for econometric analysis.

#### **3.1.2. Variable selection and data description**

This study will use  $F$  to denote the amount of FDI actually utilized by the service industry in Jiangsu Province, which has been converted into RMB according to the annual average exchange rate of the year.  $L$  denotes the total number of employed people at the end of the year in the service industry. Among them,  $F$  is the explanatory variable,  $L$  is the explanatory variable, but in order to eliminate the effect of heteroskedasticity, the variables are logarithmically processed, and the two variables that need to be studied ultimately are  $LNF$  and  $LNL$ . The relevant data of the service industry in Jiangsu Province from 2007 to 2020 are selected based on the Jiangsu Statistical Yearbook of the past years.

#### **3.1.3. Empirical process and results**

##### **(1) Unit root test**

In this paper, the variables  $LNF$  and  $LNL$  are tested for smoothness using the ADF unit root test to avoid the pseudo-regression problem that arises when performing ordinary least

squares estimation. First, the optimal lag is determined to be 2 according to the SIC criterion, and second, Table 1 reports the results of the unit root test for the above two variables. In the left three columns, the LNF time series is not significant because its t-statistic is larger than the corresponding critical value both at the 5% significance level and at the 10% significance level. After the difference treatment, its P value

is less than 0.01, which can be smooth at 1% significance level, and after the second-order difference in the right three columns, the results show smoothness. At this point, there may still be a pseudo-regression problem if the multiple regression analysis is carried out directly, so it is also necessary to carry out the cointegration test for each variable to avoid this problem.

**Table 1.** Unit root test results

Variant	The Form of test (C,T,P)	T-statistic	Conclude	Variant	The Form of test (C,T,P)	T-statistic	Conclude
LNF	C, T, 4	-1.763140 (0.6421)	Unsteady	$\Delta$ 2LNF	N, N, 0	-7.283058 (0.0000)	Steady
LNL	C, T, 4	-4.652523 (0.0268)	Steady	$\Delta$ 2LNL	N, N, 3	-7.527727 (0.0000)	Steady

Note. (C,T,P) is the form of test, where C is the intercept term, T is the trend term, P is the lag order, and N implies no;  $\Delta$  2( ) is a second-order difference sequence.

(2) Cointegration test

In this paper, we use the residual-based EG method described above to conduct cointegration tests, starting with cointegration regressions on LNL, LNF, with the following results (t-values and p-values in parentheses):

$$LNL=0.332780LNF+5.369800 \quad (1)$$

$$\begin{matrix} (12.85938) & (5.203885) & (0.0002) & (0.0000) \\ \bar{R}^2=0.6674, & F=27.08042, & D.W.=0.60 \end{matrix}$$

It can be seen that the equation is well fitted. Let the sequence of residuals  $e^t=LNL-0.332780LNF-5.369800$ , The residual series calculated by this equation is then subjected to the ADF test, and the results of the test are shown in Table 2.

**Table 2.** The results of the unit root test for  $e^t$

Variant	The Form of test (C,T,P)	ADF value	1% threshold	5% threshold	10% threshold	P-value
$e^t$	N, N, 3	-2.238510	-2.816740	-1.982344	-1.601144	0.0308

The ADF value of  $e^t$  obtained from the above test is -2.238510, Less than the ADF test critical value at the 5% significance level. Thus the hypothesis of the existence of a unit root can be rejected at the 5% significance level, indicating that  $e^t$  is a smooth series. Accordingly, it can be judged that LNL and LNF are (2, 2) order cointegration, and there is a long-term stable equilibrium relationship between them.

It can be seen through the formula (1), in the long run, for every 1% change in LNF, LNL will change by 0.33% in the same direction, in the long run, the elasticity coefficient of the number of employment in the service industry to the amount

of foreign direct investment in the service industry is 0.33, and there is a significant positive relationship between the two.

(3) VAR modeling

In this paper, the VAR model is established by using the system composed of 2 variables: the number of employment in the service industry and the amount of foreign direct investment in the service industry, and the lag order p of the model is determined by using the method of multi-criteria joint determination, and by judging by the criteria of LR, FPE, AIC, SC, and HQ, and choosing the lag order p=1, and the results are shown in Table 3.

**Table 3.** Results of the choice of VAR lag order p

Lag	LogL	LR	FPE	AIC	SC	HQ
1	34.54846	NA	3.92e-06*	-6.788546	-6.700891*	-6.977706
2	36.94608	2.664026	6.30e-06	-6.432462	-6.257152	-6.810782

The stability of the VAR model is tested next. The VAR model with lag length of 1 and 2 endogenous variables is tested to have  $1*2=2$  characteristic roots of the characteristic root polynomial. The mode of the inverse of each

characteristic root is inside the unit circle and there is no root located outside the unit circle, so the VAR model passes the stability test and is considered to be stable. The results of the test are shown in Figure 1.

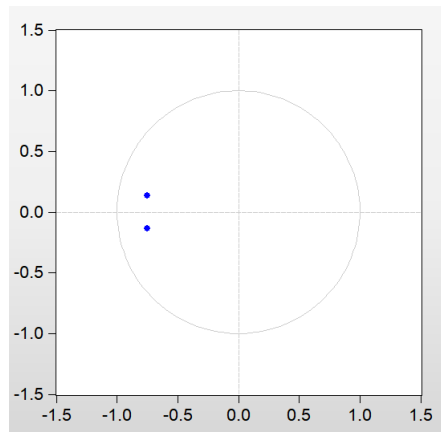


Figure 1. VAR model stability test

(4) Granger causality test

The above cointegration test can only show that there is a long-term stable equilibrium relationship between LNF and LNL, and whether there is a statistical causal relationship

needs to be further tested. This paper conducts Granger causality test based on the VAR model established above to analyze the causal relationship between the two variables. The test results are shown in Table 4.

Table 4. Results of Granger causality test

Dependent variable: LNF				Dependent variable: LNL			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LNL	0.157489	1	0.6915	LNF	0.598064	1	0.0003
All	0.157489	1	0.6915	All	0.598064	1	0.0003

In the LNL equation, LNL as an explanatory variable conducts Granger causality test on the explanatory variable LNF, and the value of the joint statistic of LNF is 0.598064 and constitutes Granger causality for LNL at the 1% level; however, the probability value of LNL in the LNF equation is 0.6915, which does not constitute Granger causality for LNF. This indicates that the lag of FDI in services can significantly explain or predict the changes in employment, and the above cointegration relationship of "for every 1% change in LNF, LNL will change by 0.33% in the same direction" is valid.

## 4. Empirical Analysis of the Employment Quality Effect of FDI in the Service Sector in Jiangsu Province

### 4.1. The Impact of FDI in the Service Sector on the Wage Level of Service Employees in Jiangsu Province

#### 4.1.1. Empirical method

The empirical method is a smoothness test of the time series, followed by a cointegration analysis of the correlation between the variables.

#### 4.1.2. Variable selection and data description

In terms of variable selection, considering the impact of FDI on the wage level of employees, the two variables of FDI as well as the wage level of employees are selected, in which the average annual wage level of employees in urban non-private units in the service industry of Jiangsu Province is taken as an explanatory variable and denoted by M, and the FDI in the service industry is taken as an explanatory variable and denoted by F. However, in order to eliminate the effect of heteroskedasticity, the variables are logarithmically processed, and the two variables that need to be studied finally are LNF and LNM. In this study, the data related to the service industry of Jiangsu Province from 2007 to 2020 are selected, M is selected as the average annual wage of urban non-private units in each year, and F is the amount of FDI actually utilized in the service industry of Jiangsu Province.

#### 4.1.3. Empirical process and results

##### (1) Unit root test

The smoothness test of the series for LNF as well as LNM yields the results of the unit root test in Table 5, which shows that the above three variables satisfy the same-order smoothness as their respective P-values are smooth at least at the 10% level of significance after performing the first-order differencing.

Table 5. Unit root test results

Variant	The Form of test (C,T,P)	T-statistic	Conclude	Variant	The Form of test (C,T,P)	T-statistic	Conclude
LNF	C, T, 4	-1.763140 (0.6421)	Unsteady	$\Delta$ LNF	C, N, 3	-2.904209 (0.0827)	Steady
LNM	C, N, 4	-4.190286 (0.0137)	Steady	$\Delta$ LNM	C, T, 3	-4.882179 (0.0204)	Steady

Note. (C,T,P) is the form of test, where C is the intercept term, T is the trend term, P is the lag order, and N implies no;  $\Delta(\cdot)$  is a first-order difference sequence.

(2) Cointegration test

After determining the smoothness of the time series, the cointegration between LNF and LNM can be tested. First, a cointegration regression is performed on both and the results are as follows (t-values and p-values in parentheses).

$$\text{LNM} = 1.249015\text{LNF} + 5.544819 \quad (2)$$

(7.120258)      (4.840687)      (0.0000)      (0.0004)

$$\bar{R}^2 = 0.792657, F = 50.69807, D.W. = 0.841833$$

It can be seen that the equation is well fitted. Let the sequence of residuals  $e^t = \text{LNM} - 1.249015\text{LNF} + 5.544819$ . The residual series calculated by this equation is then subjected to the ADF test, and the results of the test are shown in Table 6.

**Table 6.** The results of the unit root test for  $e^t$

Variant	The Form of test (C,T,P)	ADF value	1% threshold	5% threshold	10% threshold	P-value
$e^t$	N, N, 3	-2.250929	-2.816740	-1.982344	-1.601144	0.0300

The ADF value of  $e^t$  after first-order differencing obtained from the above test is -4.934993, which rejects the hypothesis of the existence of a unit root at the 5% significance level, indicating that  $e^t$  is a smooth series after first-order differencing. Accordingly, it can be judged that LNF and LNM are (1, 1) order cointegration and there is a long-term stable equilibrium relationship between the three.

Through the formula (2), it can be seen that in the long run, for every 1% change in LNF, LNM will change by 1.25% in the same direction, in the long run, the elasticity coefficient of the wage level of the service industry to the amount of

foreign direct investment in the service industry is 1.25, and there is a significant positive relationship between the two.

VAR modeling

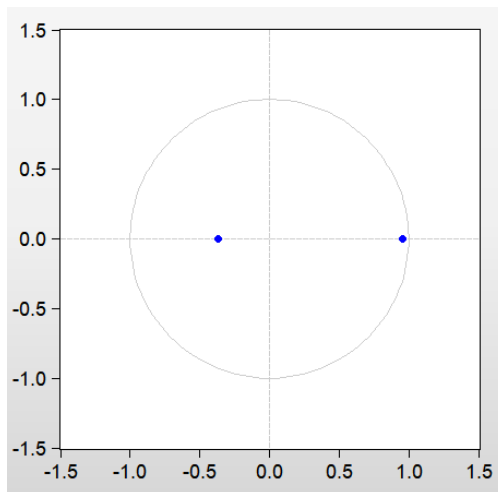
In this paper, the VAR model is established by using the system consisting of 2 variables: the average annual wage level of urban non-private workers in the service industry and the amount of foreign direct investment in the service industry, and the determination of the lag order  $p$  of the model adopts the method of joint determination of multi-criteria, which is judged by the criteria of LR, FPE, AIC, SC, and HQ and the lag order  $p=1$  is selected, and the results are shown in Table 7.

**Table 7.** Results of the choice of VAR lag order  $p$

Lag	LogL	LR	FPE	AIC	SC	HQ
1	37.07010	NA	4.65e-06*	-6.614021*	-6.492987*	-6.746795*
2	39.03235	2.354698	7.60e-06	-6.206471	-5.964403	-6.472019
3	40.91779	1.508350	1.53e-05	-5.783558	-5.420456	-6.181880

The stability of the VAR model is tested next. The VAR model passed the stability test and was considered stable. The

results of the test are shown in Figure 2.



**Figure 2.** VAR model stability test

(4) Granger causality test

The above cointegration test can only show that there is a long-term stable equilibrium relationship between LNF and LNM, and whether there is a statistical causal relationship

needs to be further tested. This paper conducts Granger causality test based on the VAR model established above to analyze the causal relationship between the two variables. The test results are shown in Table 8.

**Table 8.** Results of Granger causality test

Dependent variable: LNF				Dependent variable: LNM			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LNM	4.912798	1	0.0267	LNF	7.133047	1	0.0076
All	4.912798	1	0.0267	All	7.133047	1	0.0076

In the LNM equation, LNM as an explanatory variable conducts Granger causality test on the explanatory variable LNF, and the joint statistic value of LNF is 7.133047 and constitutes Granger causality on LNF at 1% level; however, the probability value of LNM in the LNF equation is 0.0267, which does not constitute Granger causality on LNF at 1% level. This indicates that the lag period of FDI in the service industry can significantly explain or predict the changes in the wage level of the service industry, and the above cointegration relationship of "for every 1% change in LNF, LNM will change by 1.25% in the same direction" is established.

## 5. Conclusion and recommendation

### 5.1. Conclusion

First, during the three decades since the 1990s, the service industry in Jiangsu Province has developed rapidly, with a rapid increase in the number of people employed in the service industry and a rapid increase in its share. From the cointegration relationship, there is a significant positive relationship between the absorption of foreign investment in the service industry of Jiangsu Province and both the number of employment and the wage level. Therefore, in order to maintain the stable growth of employment quantity and quality, it is necessary to maintain the healthy and steady development of the service industry. From the causality test, there is a long-term equilibrium relationship between the development of service industry and employment in Jiangsu Province, and FDI in service industry is the Granger cause of changes in the number of employment and wage level.

Secondly, from the point of view of the number of employment, the development of the service industry in Jiangsu Province has played a role in alleviating the employment pressure. From the comparison among the three industries, the capacity of the service industry in Jiangsu Province to absorb employment has come later, can go hand in hand with the secondary industry, and has great potential for absorbing employment. From the comparison of various industries within the service industry, the industry's employment absorption capacity varies, and the modern service industry absorbs most of the employed.

Thirdly, in terms of employment quality wage level, service industry FDI can promote the overall compensation level of the industry, but the effect of different industries to improve the level of compensation is different, the wage level of high-tech service industry is higher than the traditional service industry, because the high-tech service industry belongs to more technology-intensive industries, is the main aspect of FDI inflow.

### 5.2. Recommendation

At present, employment has become a major issue affecting the healthy development of our economy and society. Therefore, it is important to emphasize the creation of employment opportunities and the expansion of employment when formulating economic development goals and economic policies. Based on the conclusion of this paper on the analysis of the impact of FDI on employment in Jiangsu, I believe that the economy of Jiangsu should continue to increase the attraction of foreign investment, and at the same time, rationally organize and arrange the transfer of the traditional service industry labor force to the modern service industry, which should be strengthened for the training of the labor force. Of course, there are still some places to be studied in depth in this paper, such as the structural effect of the impact of FDI on employment in Jiangsu and the study of long-term dynamic effect is a direction for future research.

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