

Research on the Impact of Foreign Direct Investment on the Service Industry in Hubei Province in the Context of the Rise of Central China Strategy

Fengyuan Liu

*Wuhan Britain-China School, Wuhan, China
shuangy06@outlook.com*

Abstract. With the full implementation of the Rise of Central China strategy, foreign investment in the region has shifted beyond traditional manufacturing and expanded into services, emerging as a notable driver of provincial economic growth. Even so, how far foreign capital can lift the service industry depends on local conditions, above all infrastructure and service industry employment levels. Whether these conditions translate into tangible effects in Hubei Province, however, remains an open empirical question. This paper selects statistical data of Hubei Province from 2007 to 2021, and constructs an Ordinary Least-Squares (OLS) model to study the impact of Foreign Direct Investment on the development of service industry in Hubei Province. The results show that foreign direct investment has a significantly positive effect on the growth of service industry in Hubei Province when the infrastructure variable is not controlled. The positive effect of foreign capital remains statistically stable when controlling for the service industry employment scale. In the full specification model, after the infrastructure variable is incorporated, the independent contribution of foreign direct investment becomes insignificant, and infrastructure turns out to be the core driver of service industry development. Therefore, Hubei Province should further expand opening-up, rationally introduce foreign direct investment, increase investment in transportation infrastructure, optimize the employment structure of service industry, and promote the high-quality development of service industry.

Keywords: Foreign Direct Investment, service industry added value, infrastructure, employment

1. Introduction

With the deepening of China's opening-up, the service industry has become an important pillar of national economic growth. Foreign Direct Investment (FDI) acts as a key link between China and global economic development. The Rise of Central China initiative creates critical opportunities for inland provinces to open their service industry further to external capital. While FDI can drive local industrial progress, it also imposes new demands on regional service industry construction and generates tangible impacts on the evolution of regional service industry.

In 2024, Hubei Province attracted \$1,921.96 million in actually-utilized foreign investment, of which the service industry accounted for 60.7% of the total. The service industry has expanded rapidly, and the share of actually utilized foreign investment in the tertiary industry has continued to rise. This trend shows that foreign investment has gradually shifted away from traditional manufacturing to modern service industries, including scientific and technological services and information transmission. However, it cannot be ignored that some problems have been exposed in the process of service industry development. Compared with economically-developed eastern coastal regions, Hubei still exhibits certain gaps in opening-up depth, industrial agglomeration, and human capital within the service industry.

Existing literature has explored the multiple economic effects brought by FDI. Some studies hold that expanding the scale of two-way FDI and improving its coordinated development level can promote China's high-quality economic development. It mainly acts on high-quality economic development through three channels: the technology spillover effect, the market competition effect, and the industrial upgrading effect [1, 2]. Some studies divide service industry FDI into quantity-oriented and quality-oriented categories to examine its heterogeneous impacts on industrial development. Empirical results indicate that quantity-oriented service industry FDI exerts an inhibiting effect on the improvement of total factor productivity in the service industry. Quality-oriented service industry FDI shows a positive U-shaped relationship with service industry total factor productivity, and it can promote the high-quality development of the service economy only after crossing the inflection point [3]. Some studies suggest that the level of host-country formal institutions can change the economic-growth effect of FDI, based on sample of developing countries, institutional improvement may weaken the contribution of FDI to regional economic growth [4]. Some scholars conduct research based on foreign investment access policies to explore the employment-driving effect of foreign capital entry. Studies indicate that foreign capital entry can raise the industry-level job-creation rate and expand employment scale. It generates employment not only by increasing labor demand of incumbent enterprises, but also by fostering new market entities to create new jobs [5]. Some scholars find through empirical research that FDI can boost the employment of low-skilled labor in China's manufacturing industry, while it has no significant impact on the employment of high-skilled labor [6]. Foreign capital inflow not only expands employment scale, and employment growth further becomes an important driving force for regional economic growth [7]. Existing studies point out that infrastructure moderates the economic effects of FDI. Only after the stock of infrastructure crosses the corresponding threshold can the moderating mechanism be effectively released [8]. Relevant research shows that favorable institutional quality and sound infrastructure can exert positive attraction for foreign capital inflows [9]. Some empirical findings also suggest that the attracting effect of improved infrastructure quality on foreign capital inflows is heterogeneous, and its promotion effect tends to be more significant in regions with weak infrastructure [10].

Existing studies mainly focus on the national-level samples or samples from eastern coastal regions. They discuss FDI's effects on economic growth, employment and infrastructure-related topics and have produced fruitful results. However, there is still few targeted empirical investigations that center on service industry FDI within Hubei Province of central China. The real impacts and transmission channels generated by FDI for the service industry development in inland central provinces remain insufficiently explored. Against this identified research gap, this paper adopts time-series data for Hubei's service industry to empirically examine how FDI affects its development, so as to offer empirical references for proper utilization of FDI across central China's service industries.

2. Methodology

2.1. Data source and sample selection

This study selects annual time-series data from 2007 to 2021, including Hubei's service industry added value, service industry employment, actual utilized FDI in the service industry and infrastructure. The sample period is chosen to capture the post-reform development features of Hubei's service industry. All data are collected from *the Hubei Provincial Statistical Yearbook* of various years. All quantitative analyses in this paper are performed using Excel and EViews 14 software. Table 1 provides the variable definition.

Table 1. Variable definition

Variable Symbol	Variable Definition
SVA	Service industry added value of Hubei Province
FDI	Actual utilized foreign direct investment of Hubei Province
EMP3	Employment size of the service industry in Hubei Province
INFRA	Infrastructure level represented by highway mileage of Hubei Province

2.2. OLS

This study adopts the Ordinary Least-Squares (OLS) regression method for empirical estimation. As one of the widely-used classical estimation approaches for time-series data, OLS seeks to derive optimal parameter estimates through minimizing the aggregate squared deviations separating observed data and fitted values. For linear regression models, under core econometric premises, the OLS estimator has attractive desirable statistical traits such as unbiasedness and efficiency, which receives broad acceptance within applied econometric scholarship.

To investigate how service-industry FDI influences service-industry development in Hubei Province, this paper constructs the baseline OLS regression model as follows:

$$SVA_t = \beta_0 + \beta_1 FDI_t + \beta_2 EMP3_t + \beta_3 INFRA_t + \varepsilon_t \quad (1)$$

Where SVA_t refers to the service industry added value of Hubei Province in year t ; FDI_t denotes the actual utilized FDI in the service industry; $EMP3_t$ represents the employment size of the tertiary industry; $INFRA_t$ stand for the regional infrastructure level proxied by highway mileage; β_0 is the constant term; β_1 , β_2 and β_3 are the coefficients to be estimated; ε_t is the random disturbance term. All variables are transformed into natural logarithms to mitigate potential heteroscedasticity.

3. Empirical results and analysis

This section presents and interprets the empirical results. Section 3.1 reports the descriptive statistics of all variables; Section 3.2 discusses the baseline OLS regression results.

3.1. Descriptive statistics

Table 2. Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
LNSVA	15	9.361	0.605	8.329	10.174
LNFDI	15	5.151	0.723	3.928	6.052
LNEMP3	15	7.159	0.119	7.012	7.328
LNINFRA	15	12.377	0.163	12.121	12.601

Table 2 reports the descriptive statistics for all logtransformed variables based on 15 annual observations from 2007 to 2021. As reflected by descriptive statistics, LNEMP3 and LNINFRA yield low standard deviations, pointing to modest time-series variations in service-sector employment and infrastructure within the research window. By contrast, LNFDI records a relatively high standard deviation value of 0.723, revealing noticeable annual swings in foreign capital inflows targeting Hubei's service sector. Furthermore, Jarque-Bera test produces $p > 0.05$ for all variables, which indicates that each series approximately obeys a normal distribution and meets the basic prerequisites for subsequent regression estimation.

3.2. Regression analysis

This paper conducts empirical analysis (Table 3) by constructing regression models to investigate the economic impact of actually-utilized foreign capital on Hubei's service industry.

Table 3. Regression analysis(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. t-statistics in parentheses)

Variable	(1)LNSVA	(2)LNSVA	(3) LNSVA
LNFDI	0.8227 *** (19.427)	0.7673 *** (6.4116)	0.1509 (1.3043)
LNEMP3		0.3842 - 0.8194* (0.4968) (-1.9140)	
LNINFRA		3.5591 *** (6.1924)	
LNFDI	5.1235 *** (23.2754)	2.6581 (0.5350)	-29.6021 (-5.1420)
Observations	15	15	15
R-squared	0.9667	0.9674	0.9927

Model (1) merely incorporates the core explanatory variable LNFDI. The coefficient of FDI reaches 0.8227 and is significantly positive at the 1 % level. It suggests that foreign capital expansion can boost service industry output in Hubei without constraints from infrastructure and other factors.

Model (2) introduces the service industry employment variable (LNEMP3) on the basis of the baseline model. The coefficient of LNFDI drops to 0.7673 and remains significantly positive at the

1% level, while employment scale carries no statistical significance. It indicates that output variations in service industries cannot be explained by employment scale alone.

After incorporating the infrastructure indicator LNINFRA into Model (3), notable shifts can be observed within the regression outputs. LNFDI's coefficient falls to 0.1509 and is no longer statistically significant. Infrastructure, though, gets a coefficient of 3.5591 and is significantly positive at the 1 % level — it turns out to be the main force driving service-sector growth. LNEMP3, meanwhile, comes out negative and significant at the 10 % level in this full specification. The model as a whole fits the data well, and no serious serial-correlation problem shows up. So the regression results can be trusted.

FDI loses statistical significance once infrastructure enters estimation. It proves the growth effect of foreign capital observed in simple regressions is not independent. For Hubei, FDI can hardly generate real service-sector output gains without local transport, communication and other public supports.

Special attention should be paid to the negative significant coefficient of service industry employment in the full model. Traditional theory expects larger employment to lift service-sector output, yet the sample delivers opposite results. One major explanation is that Hubei's service-sector absorbs plenty of low-product-labour transferred from agriculture and traditional industries. More jobs do not bring corresponding improvement in production efficiency. Besides, only 15 annual observations are available in this time-series research, and the limited sample may amplify such results inconsistent with theoretical expectations.

Some of the findings are consistent with existing regional studies on FDI and service industry growth, which recognize the conditional role of infrastructure. Divergences from other papers stem from the provincial sample and the 2007-2021 research period.

4. Conclusion

Major findings are summarized as follows. Firstly, FDI has a significant positive correlation with service-sector output when infrastructure is not controlled. Secondly, FDI becomes insignificant after infrastructure is included, and infrastructure acts as the core driving force for service industry growth within the sample period. Thirdly, service industry employment obtains a negative significant coefficient in the full model. Due to sample limits and industrial features, this counter-intuitive result should be interpreted cautiously. From the policy perspective, Hubei should keep strengthening infrastructure construction to lay solid foundations for service-sector development. Local authorities may continue to attract foreign capital, yet they ought not to over-estimate its independent contribution. Efforts should also be made to optimize business environments and raise labour productivity in service industries. This research has certain limitations. The dataset consists of merely 15 annual time-series observations, which restricts robustness tests and causal identification. Future studies may extend time coverage, adopt city-level panel data and introduce variables such as human capital and technological innovation to obtain more solid empirical evidence.

References

- [1] Yang, B., & Ren, F. (2023). Spatial spillover effects of two-way FDI on China's high-quality economic development. *Soft Science*, 37(11), 1-8.
- [2] Qiu, Y., & Hu, H. (2023). Does the coordinated development of two-way FDI promote China's high-quality economic development? *Journal of Social Science of Hunan Normal University*, 52(3), 78-87.

- [3] Zhang, N. L., & Zhao, Y. T. (2024). Research on the impact of service-sector foreign direct investment on industrial quality improvement and efficiency enhancement. *Shandong Social Sciences*, 12, 112-120.
- [4] Shi, B. H., & Yang, Y. S. (2025). FDI, formal institutions and economic growth: Empirical analysis based on South and Southeast Asian countries. *Journal of Customs and Trade*, 1, 84-102.
- [5] Chen, Y. B., Hu, J. W., Du, Y. R., & Zhan, C. Q. (2024). Foreign capital entry and employment growth: Evidence from the relaxation of foreign-investment access restrictions in China. *China Economic Quarterly*, 3, 145-168.
- [6] Li, Z. L. (2018). Research on the driving effects of FDI on China's economic growth and employment: A retest based on LMDI mode. *Soft Science*, 32(5), 45-50.
- [7] Yue, L. L. (2021). Research on the impact of FDI on China's economic growth and employment: Based on VEC error-correction model. *Northern Economy and Trade*, 3, 78-81.
- [8] Hu, C. G., Li, Y. Z., Zhang, D., & Bo, W. G. (2023). Infrastructure preference of FDI and urban economic growth: Evidence from three metropolitan belts in eastern coastal China. *China Soft Science*, 7, 89-101.
- [9] Zhang, H. W., & Sun, G. J. (2022). Institutional quality, infrastructure of countries along the Belt and Road and the location choice of China's outward foreign direct investment. *Economic Forum*, 3, 56-63.
- [10] Cui, Y., & Yu, J. P. (2017). Infrastructure quality of countries along the Belt and Road and China's outward foreign direct investment: A research based on panel threshold model. *Forum of World Economics & Politics*, 5, 135-152.