

Research on the impact of financial expansion on FDI

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Abstract. As China is currently in a new stage of opening up to the outside world, there is widespread concern about how to attract foreign direct investment. Given the relative paucity of literature examining the effect of financial expansion on FDI, this paper examines the effect of the value added of the financial sector as a share of GDP on FDI per capita for each province in China from 2003 to 2018 to verify relevant mechanisms. The results find that financial expansion inhibits domestic FDI inflows and the effect has regional heterogeneity, which may be caused by inadequate financial system reform and misallocation of financial resources. It is therefore important to promote the high-quality development of the financial sector and improve the rational allocation of factors while China's economy continues to grow.

Keywords: Financial expansion; FDI inflows; Resource mismatch; Regional heterogeneity.

1. Introduction

1.1 Background of the study

Since the reform and opening up, investment, as one of the "troika" driving economic growth, has not only boosted domestic employment and increased government tax revenue, but also brought spillover effects such as technology and management experience to local enterprises. Meanwhile, a series of "investment attraction" policies have been implemented in China, relying on the domestic market's resource advantages to bring in foreign investment, which in turn improves the capital structure of the domestic market and enhances China's position in the global value chain. As a result, there has been widespread interest in how foreign investment can be further introduced and influenced. In the context of the current macroeconomic policy environment, external factors such as government systems, urbanization, infrastructure, environmental regulations and spatial proximity, as well as internal factors such as corporate fixed asset investment and R&D investment, may all influence a country's foreign investment inflows to some extent.

Since China's successful accession to the World Trade Organisation (WTO), the development of the financial sector has stepped into the process of globalisation and the financial market system has been continuously improved. Nevertheless, some scholars have found that unreasonable expansion will lead to deficiencies such as unsound financial system reform and regional differences in the level of financial development. This will likely have a negative effect on the spillover effects generated by FDI, which in turn will have a direct or indirect impact on the inflow of foreign capital.

A number of scholars have already revealed the influencing factors of FDI inflow based on different perspectives. Zhang et al. (2014) mentioned that institutional factors may have a negative effect on the heterogeneity of local enterprises and limit the conditions of enterprises' ability to absorb FDI spillover effects, thus reducing their attractiveness to foreign capital [6]. What's more, as environmental pollution becomes increasingly serious in China and environmental protection is deeply rooted in people's hearts, local governments have stepped up environmental control efforts, which may have a negative effect on attracting foreign investment. Many scholars support the "pollution paradise doctrine", which suggests that countries with weaker environmental controls may have lower pollutant treatment costs and are more likely to attract foreign investment (Zhang et al., 2016) [5]. Moreover, the introduction of foreign banks will also have a positive effect on FDI inflows through mechanisms such as driving related customers and industries, reducing information asymmetry between the host country and abroad, and using internal financing with external capital to

reduce costs (Wei et al., 2022) [2]. In addition to the above-mentioned factors, it has been pointed out in the literature that the real effective exchange rate of the RMB, market size, labour costs, infrastructure development and taxation in the host country all have an impact on FDI inflows. Specifically, the real effective exchange rate of RMB, labour cost and taxation of the host country have a dampening effect on FDI absorption, while market size and infrastructure development have a facilitating effect on FDI inflows.

With the deepening reform of the financial system and the gradual improvement of the capital market, China's financial sector is growing at an unprecedented pace. However, the expansion of the financial sector is also accompanied by problems such as the "de-realisation" of capital, which will crowd out loans from real enterprises to the virtual economy, thereby inhibiting innovation (Zhang et al., 2021) [4]. Nevertheless, based on a threshold regression model, Dong and Wang (2022) argue that financial development has a phased effect on FDI inflows, and that the current level of domestic financial development is in the favourable range for FDI and has a positive effect on it [1].

Compared with the existing research, the contribution of this paper is mainly in the following two aspects. Firstly, throughout the literature on the factors influencing FDI inflows, there is relatively little literature examining the effect of financial expansion on FDI, and scholars have yet to reach a consensus on this. Given that the domestic financial sector does have the problem of unreasonable expansion, this paper constructs a two-way fixed-effects model based on panel data on the value added of the financial sector and actual utilization of FDI in 30 provinces from 2003-2018, as a way to analyze the effects of financial expansion on domestic FDI. Secondly, the paper concludes through empirical analysis that the expansion of the financial sector may have a significant inhibiting effect on FDI inflows, which is regionally heterogeneous. This finding can be attributed to imperfections in the reform of the domestic financial system, differences in the degree of economic development across regions and mismatch of financial resources. The series of empirical findings provides a valuable reference for reconciling the rate of financial expansion with the strategic objective of promoting FDI inflows and further financial system reform in China.

The paper is structured as follows: based on the two-way fixed-effects model, the following paper will explain the relationship between financial expansion and FDI from two aspects of full-sample test and sub-sample test. At the same time, relevant control variables are selected based on existing literature to improve the accuracy of empirical results. And the final concluding section will provide reference suggestions for the follow-up development of domestic financial industry.

2. Empirical design

2.1 Econometric model

The following two-way fixed effects model is designed to test the possible impact of financial expansion on FDI inflows in each of the provinces.

$$fdi_{it} = \alpha_0 + \alpha_1 finance_gdp_t + \eta Control + \lambda_i + \nu_t + \varepsilon_{it} \quad (1)$$

In formula (1), the explained variable *fdi* represents the actual per capita utilization of FDI by Chinese province *i* in year *T*, the core explanatory variable *finance_gdp* represents the value added of the financial sector as a share of GDP in Chinese province *i* in year *T*, *Control* represents the control variables, λ_i represents province fixed effects, ν_t represents time fixed effects, and ε_{it} denotes the random error term.

According to the sample data, as an important component of GDP, the added value of the national financial sector has gradually increased along with the development of the financial sector, so the share of added value of the financial sector in GDP is selected as the core explanatory variable of the model in this paper. In terms of the selection of the control variable, this paper mainly takes two aspects into consideration to ensure that the core explanatory variables obtain more robust estimation results. On the one hand, the control variables are selected correlated with the explanatory variables as far as possible, and on the other hand, the problem of multicollinearity among the explanatory

variables should be avoided. Taking the above factors into consideration, this paper selects five factors as control variables: government intervention (gov), urbanisation (urb), infrastructure (tra), environmental regulation (reg) and R&D investment (rd). The government intervention (gov) is defined as regional fiscal expenditure as a share of GDP in each province. As the maker and executor of relevant policies, the government's intervention on FDI will greatly affect a country's attractiveness to foreign investment. Urbanisation (urb), defined as the level of urbanisation in each province and region. Since the reform and opening up, the urbanisation process has gradually accelerated in each region, which in turn has broken through the barriers of production factors and capital to achieve industrial agglomeration and to attract FDI with the advantages of labour, technology and innovation. For this reason urbanisation needs to be controlled for in formula (1). The infrastructure (tra) is defined as the transport density of each provincial area, expressed as the sum of rail, water and road miles as a proportion of each region's land area. In terms of national policies, the inflow of foreign investment is facilitated by the development of infrastructure, such as ports and railways, which may become new hotspots for foreign investment. The environmental regulation is expressed as the share of total industrial pollution control investment in the value added of industry in each province, and according to the "pollution paradise doctrine" hypothesis mentioned above, countries with more lax environmental regulations are more attractive to foreign investors. The R&D investment (rd) is defined as internal expenditure on R&D as a share of GDP, and increased R&D by firms will stimulate internal dynamism, which may have a positive effect on FDI inflows. In addition, this paper also controls for individual fixed effects λ_i and year fixed effects ν_t across provinces in formula (1), in order to eliminate the problem of omitted variables due to individual heterogeneity across provinces.

This paper selects panel data from 30 provinces in China from 2003-2018 as the research sample (Hong Kong, Macao, Taiwan and Tibet were not included due to data unavailability), and the data were obtained from the China Statistical Yearbook, China Financial Yearbook, EPS database and the collection and collation of the statistical yearbooks of each province. In order to objectively reflect the level of foreign capital inflow in each region of China, FDI per capita was selected as the explanatory variable to study the impact of financial expansion on FDI, and the descriptive statistics of the selected variables are shown in Table 1. In order to reduce the influence of possible heteroskedasticity in the data, all variables are logarithmised in this paper.

Table 1. Descriptive statistics of variables

Variable	Observations	Average	Max	Min	Standard deviation
finance_gdp	480	0.052	0.196	0.006	0.030
fdi	480	1085.71	9147.59	5.028	1272.15
gov	480	21.13	62.69	7.92	9.48
urb	480	52.38	89.6	25.66	14.41
tra	480	0.8408	2.5290	0.0358	0.5326
rd	480	1.3909	6.1701	0.1749	1.0576
reg	480	0.4103	2.8546	0.0359	0.3421

3. Empirical analysis

3.1 Full sample test results

Table 2 presents the results of the benchmark regressions obtained using a two-way fixed effects model based on formula (1). Firstly, we observe the effect of the value added of the financial sector as a share of GDP on FDI per capita in each province from 2003-2018 without adding any control variables. The regression results of model (1) in Table 2 show that the regression coefficient of the core variable *finance_gdp* is significantly negative at the 5% statistical level, implying that FDI inflows are more likely to be curbed in regions with relatively higher shares of financial sector value added to GDP. And this regression coefficient suggests that a one percentage point increase in the value added of the financial sector as a share of GDP is associated with a significant 0.294 percentage point decrease in FDI per capita. Table 2 model (2) (3) (4) (5) (6), incorporating each control variable

separately in a stepwise regression, the regression coefficient for *finance_gdp* remains significantly negative at the 10% level. In economic terms, this regression coefficient indicates that a one percentage point increase in the value added of the financial sector as a share of GDP is associated with a significant decrease in FDI per capita of 0.266, 0.250, 0.254, 0.242 and 0.248 percentage points respectively. These results all preliminary suggest that the expansion of the financial sector has a significant dampening effect on FDI in China.

Table 2. Empirical results of the effect of financial expansion on FDI by province

	(1)	(2)	(3)	(4)	(5)	(6)
<i>finance_gdp</i>	-0.294 ** (-2.00)	-0.266 * (-1.78)	-0.250 * (-1.73)	-0.254 * (-1.75)	-0.242 * (-1.67)	-0.248 * (-1.71)
<i>gov</i>		-0.369 (-0.98)	-0.563 (-1.54)	-0.559 (-1.52)	-0.412 (-1.10)	-0.434 (-1.15)
<i>urb</i>			2.650 *** (5.70)	2.723 *** (5.27)	2.600 *** (5.00)	2.521 *** (4.75)
<i>tra</i>				-0.080 (-0.32)	-0.066 (-0.27)	-0.041 (-0.17)
<i>reg</i>					-0.100 * (-1.79)	-0.105 * (-1.87)
<i>rd</i>						0.131 (0.76)
Cons	4.498 *** (8.72)	5.573 *** (4.58)	-3.725 * (-1.85)	-4.109 * (-1.76)	-4.083 * (-1.75)	-3.696 (-1.55)
Provincial fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observation	480	480	480	480	480	480
R-squared	0.3457	0.3471	0.3929	0.3930	0.3975	0.3983

Note: "**", "***" and "****" indicate that the estimated coefficients pass the 10%, 5% and 1% significance level tests respectively, and the values in brackets are t-values; same as in Table 3.

As for the control variables, the regression results of model (6) with the inclusion of each control variable show that the regression coefficients of government regulation and infrastructure are negative, the regression coefficient of R&D investment is positive but insignificant; the regression coefficient of urbanisation rate is statistically significant positive at the 1% level; the regression coefficient of environmental regulation is significantly negative at the 10% statistical level, indicating that increased investment in R&D and higher urbanisation rate may help attract FDI inflows, while infrastructure, stringent government regulations and environmental regulations will discourage FDI inflows.

There are a number of reasons for this empirical result. Firstly, despite the deepening reform of China's financial system, it remains unsound due to irrational expansion. This is reflected in the preference of domestic state-owned banks to lend money to state-owned enterprises or promising real estate sectors as an important short-term driver of GDP growth, while failing to provide appropriate support and external financing to the majority of private real enterprises. This in turn squeezes out the innovative effect of enterprises and their attractiveness to foreign investors. Secondly, the irrational distribution of the domestic industrial structure has led to a massive waste of production factors and overcapacity in the real economy, which has increased the systemic risk of finance and further contributed to the irrational expansion of the financial sector. Moreover, China's cumbersome financial credit vetting process has also inhibited foreign capital inflows to a certain degree.

3.2 Sub-sample test results

Table 3. Empirical results of the impact of regional financial expansion on FDI

	East	Central	Western
finance_gdp	-0.389 ** (-2.45)	-0.241 (-1.56)	-0.875 ** (-2.32)
gov	1.690 *** (4.21)	-0.455 (-0.86)	-3.202 *** (-3.97)
urb	0.262 (0.49)	3.150 *** (3.96)	5.583 * (2.81)
tra	-0.141 (-0.59)	0.323 (0.73)	0.162 (0.35)
reg	0.095 * (1.87)	-0.020 (-0.28)	-0.565 (-4.33)
rd	-0.531 ** (-2.27)	-0.731 * (-2.80)	1.695453 (4.34)
Cons	0.2784 (0.12)	-6.181 ** (-2.13)	-7.879 (-0.98)
Provincial fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observation	192	144	144
R-squared	0.3788	0.8672	0.6122

The regression results for the Eastern, Central and Western regions are presented in groups in Table 3. The regression results for the eastern region show that the regression coefficient for the core variable *finance_gdp* is significantly negative at the 5% statistical level. In economic terms, this regression coefficient indicates that a one percentage point increase in the value added of the financial sector as a share of GDP is associated with a significant 0.389 percentage point decrease in FDI per capita. As for the control variables, the regression coefficients of urbanisation rate are positive and infrastructure is negative but insignificant; the regression coefficients of government regulation and environmental regulation are significantly positive at the 1% and 10% statistical levels respectively; the regression coefficient of R&D investment is significantly negative at the 5% statistical level, which indicates that stringent government and environmental regulations and higher urbanisation rate help attract FDI, while infrastructure and corporate investment in R&D discourage FDI inflows.

The regression results for the Central Region show that the regression coefficient of the core variable *finance_gdp* is negative but not significant. For the control variables, only urbanisation rate and R&D investment are significantly related to FDI per capita, with urbanisation rate being significantly positive at the 1% statistical level and R&D investment being significantly negative at the 10% statistical level.

The regression results for the Western region show that the regression coefficient of the core variable *finance_gdp* is significantly negative at the 1% statistical level. In economic terms, this regression coefficient indicates that a one percentage point increase in the value added of the financial sector as a share of GDP is associated with a significant 0.875 percentage point decrease in FDI per capita. As for the control variables, the regression coefficients of infrastructure and R&D investment are positive, while the regression coefficient of environmental regulation is negative but neither is significant; the regression coefficient of government regulation is significantly negative at the 1% statistical level; the regression coefficient of the urbanisation rate is significantly positive at the 10% statistical level, which indicates that stringent government regulation and environmental regulation are not conducive to FDI inflows, while infrastructure development, R&D investment and higher urbanisation rate will promote FDI inflows.

The above empirical results show that the impact of domestic financial expansion on FDI is regionally heterogeneous, with the ratio of financial sector value added to GDP in the eastern and western regions having a more significant inhibiting effect on FDI per capita. This may be attributed to a number of reasons, with the eastern region taking full advantage of the inherent advantages of

the coastal region and being in the leading position of domestic economic development for a long time under the implementation of the domestic "incoming" strategy. The financial sector has therefore been highly inflated for a long time, resulting in greater financing constraints for private manufacturing companies, which manifests itself in higher financing costs and thus a deterrent to foreign investment. In contrast, the western region has long lacked opportunities for foreign investment due to its significantly lower level of economic development than other two regions. The implementation of "the Western Development strategy" was accompanied by the emergence of problems such as irrational industrial structure and waste of resources, and the mismatch of resources between manufacturing and financial services is one of the factors contributing to the relationship between financial expansion and FDI.

4. Conclusion

4.1 Conclusion

China is at a stage of development where it is opening up to the outside world, so how to accelerate the introduction of foreign investment is an urgent issue to be resolved. In view of this, there is a contemporary necessity to study the important proposition of the effect of various factors on FDI and the related mechanisms. This paper selects panel data of 30 provinces in China from 2003 to 2018 as the research sample and constructs a two-way fixed-effects model to empirically explore the effect of regional financial expansion on FDI inflows. It is concluded that the relatively rapid expansion of the financial industry may inhibit FDI inflow, and there is regional heterogeneity in this finding, which is reflected in that the financial development in the eastern and western regions has a more significant inhibiting effect on FDI inflow than that in the central region. According to the empirical analysis of this paper, the relatively unreasonable expansion of the domestic financial sector is the key to explain this inhibiting effect, which is mainly reflected in the imperfection of the financial system reform and the negative effect of the resource mismatch between the real sector and the financial sector.

4.2 Recommendations

Based on the above-mentioned empirical analysis and combined with the financial development level and FDI absorption status of each region, this paper makes recommendations in the following three aspects. Firstly, the pace of financial system reform should be adjusted to promote the financial sector towards high-quality development in order to better accommodate the inflow of foreign capital. For the eastern regions where the financial sector is over-inflated or the less developed western regions, the financial structure should be actively guided towards avoiding the unbalanced development of the financial sector and the real economy sector. Secondly, optimize the allocation of financial resources to prevent resource misallocation caused by over-concentration of factors, and attract foreign investment by combining regional advantages and financial development heterogeneity. Finally, it is of great importance to pay attention to the "de-realisation" of finance and to strengthen financial supervision and improve the way it is conducted. For example, by using advanced technological tools, expertise and information for timely monitoring, so as to reduce the cost of correction.

There are still some deficiencies in this paper. Since the data selection in this paper stays at the macro level and data for provinces such as Tibet are missing due to data unavailability, the empirical analysis is not precise enough even though it is concluded that financial sector expansion inhibits FDI inflows. In the future, this paper can analyse the mechanisms of interaction between financial expansion and foreign firms by collecting and collating relevant micro-data, for example at the firm level.

References

- [1] Dong S & Wang Y. (2022). On impact of financial development on FDI inflow - based on threshold regression model . Journal of Jilin Business and Technology College (01), 77-83+125.
- [2] Wei Z & Chen Z. (2022). Research on the impact of foreign banks on FDI inflow in China. Lingnan Journal (01), 98-106.
- [3] Zhang J & Chen R. (2022). How does financial expansion affect China's exports. Finance & Trade Economics (01), 107-121.
- [4] Zhang J, Wu S & Jin Y. (2021). Financial expansion and Chinese Local enterprises Innovation:An inverted U-shaped relationship. Journal of Financial Research (04), 55-72.
- [5] Zhang P, Li, H & Hu J. (2016). The impact of China's environment regulation on FDI. World Economic Studies (03), 123-133+136.
- [6] Zhang X, Guo B & Zhang C. (2014). The impact of institutional factors on FDI spillover effects - An empirical study based on the database of Chinese industrial enterprises. Macroeconomics (08), 32-46+99.