**Frontiers in Business, Economics and Management**
ISSN: 2766-824X | Vol. 11, No. 2, 2023

# The Impact of FDI on High-Quality Development in the Yangtze River Economic Belt

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**Abstract:** This article utilizes the panel data of 31 cities in the Yangtze River Economic Belt from 2003-2018 to construct a panel model and empirically studies the impact of FDI on the high-quality development of the Yangtze River Economic Belt. The results show that FDI has a positive role in promoting high-quality development in the Yangtze River Economic Belt in the total sample regression. In subsample regressions, the role of FDI in promoting high-quality development in the upper, middle and lower reaches of the Yangtze River Economic Belt is not the same. Based on this, local governments in different regions should propose different foreign direct investment policies according to local conditions to promote economic transformation and upgrading.

**Keywords:** FDI; High-quality development; Yangtze River Economic Belt.

## 1. Introduction

The report of the 20th National Congress of the Communist Party of China points out that high-quality development is the top priority in fully building a modern socialist country. The report further highlights the overall and long-term significance of development quality by clearly defining high-quality development as the primary task of fully building a modern socialist country. We should adhere to taking expanding domestic demand as the strategic focus and combine it organically with deepening supply-side structural reforms.

Over the past decade, China has steadily advanced high-level opening up to the outside world. China has become a major trading partner for more than 140 countries and regions and the world's largest trader in goods. Annual actual utilization of foreign capital has grown from over 700 billion RMB to 11.5 trillion RMB, and the overseas investment stock has increased from less than 0.6 trillion USD to more than 2.7 trillion USD. While foreign trade has developed rapidly, how to utilize FDI, improve the quality of FDI introduction, and give full play to the leading role of FDI in China's economic development has become a very important issue.

General Secretary Xi Jinping has convened three symposiums to make instructions on the overall plan for the Yangtze River Economic Belt. We should unswervingly implement the new development philosophy and promote high-quality development of the Yangtze River Economic Belt. This article selects Yangtze River basin cities as empirical objects to study the impact of FDI on high-quality development, for the reason that the Yangtze River Economic Belt has the unique advantages of water transportation, relatively developed coastal conditions, and was one of the first areas to benefit from reform and opening up. After the 20th National Congress, with the imperative task of high-quality development, the economic status of the Yangtze River Basin in the country will continue to rise. To scientifically plan and strategically study the Yangtze River Basin requires the comprehensive utilization and full development. Researching the impact of FDI on the high-quality development of the Yangtze River Economic Belt is significantly representative. If FDI has a significant positive impact on high-quality development, what measures should we take in the future to further improve the quality of FDI?

This research starts from the current situation of the Yangtze River Economic Belt, uses the data of the Yangtze River basin cities from 2003-2018, selects multidimensional economic development indicators to measure the high-quality development index, examines the impact of foreign direct investment on the overall high-quality development of the Yangtze River Economic Belt cities, and considers the uneven regional economic development and different regional economic characteristics of the upper, middle and lower reaches of the Yangtze River. It also uses subsample regression to examine the differences in the impact of FDI on the high-quality economic development of different regions, and based on the regression results and regional economic characteristics, it explores the impact mechanism of foreign direct investment on the economic development of different river basins, and provides references for the high-quality development of regional economies in the Yangtze River Basin and basis for government policy making.

## 2. Literature Review

### 2.1. Research Status on the Impact of FDI on High-Quality Development

There have been many studies on the impact of foreign direct investment on high-quality economic development. Wei Houkai (2002) found that the imbalanced distribution of FDI is the main reason for the differences in GDP growth between developed eastern regions and underdeveloped western regions. Wang Chengqi (2002) et al. found that FDI has a stronger impact on economically developed regions, and the role of FDI in economic growth is maximized when competition between enterprises is most intense. Wang Yuzhe and Luo Nengsheng (2019) found that outward direct investment affects income gaps in home countries. Zhang Erzhen and Dai Xiang (2018) put forward the problems and limitations of China's current use of foreign capital, and proposed countermeasures on how to use foreign capital to

improve China's industrial competitiveness. Xu Chunqi (2018) et al. found that FDI has a small promoting effect on China's technological progress, and its impact on the technological progress of the three industrial sectors is different. Philip Gunby (2017) et al. found that FDI has an impact on China's economic growth, but the impact is far less than the simple aggregation of existing estimates. Xu Jianwei and Guo Qiyong (2016) found that overall, FDI has significant effects in driving regional economic growth and alleviating employment pressure. Sui Hongguang used the system GMM method to empirically analyze the relationship between FDI and economic development at the provincial and municipal levels from the provincial level sample, and found that foreign direct investment has a significant positive role in promoting the quality of economic growth in China, and believed that government factors can promote this positive role. Zhou Zhongbao et al: The impact of foreign direct investment on China's high-quality economic development - An analysis based on Index DEA and panel quantile regression showed the positive role of FDI. Lin Li and Lu Zhiqiang also found that FDI has a positive role in promoting the quality of China's economic growth using the system GMM method, but the impact is small. Shen Guoyun (2017) based on the panel data of China's 29 provinces and cities' auto industry from 2004-2013, using the dynamic panel threshold model, found that FDI has an inhibitory effect on the quality of economic growth. Sui Hongguang (2017) et al. analyzed based on the sample of 29 provinces and cities in China and believed that FDI inhibits the quality of economic growth, but with the increase of the RMB exchange rate screening effect, it plays a buffering role in the inhibitory effect of FDI on economic growth quality. The research results of this paper are consistent with Lin Li, Lu Zhiqiang, Sui Hongguang et al., believing that FDI can promote the high-quality development of regional economies. It is also found that the informatization level and urbanization level can promote the impact of FDI on regional economic quality development. Sang Baichuan and Zhang Caiyun (2018) elaborated on the relationship between foreign direct investment and high-quality economic development, arguing that in order to enable FDI to become a driving force for the high-quality development of the national economy, we need to further optimize the business environment, expand market access, and build a policy system to ensure foreign direct investment to promote high-quality development.

Based on the research results of current scholars, research is still generally stuck at the macro level and no deeper analysis has been conducted. Against the backdrop of the 20th National Congress proposing high-quality development as the top priority in fully building a modern socialist country, whether FDI has a significant impact on the high-quality development of the Yangtze River Economic Belt is worth in-depth discussion. This can provide reasonable recommendations for China's use of foreign direct investment.

## 2.2. Impact of FDI on Economic Growth

Regarding research on the impact of foreign direct investment on economic growth, the focuses of scholars in different development stages are different. Current research on the impact of foreign direct investment on economic growth is mainly divided into two categories: the impact of foreign direct investment on the total economic growth and the impact of foreign direct investment on the quality of economic growth.

Regarding the impact of foreign direct investment on total economic growth. Some scholars believe that the reasonable introduction of foreign direct investment can bring advanced production technology, mature management experience and outstanding human capital to the host country, generating demonstration and imitation effects, competition and human capital flow effects on domestic enterprises, thereby promoting total economic growth. Some scholars believe that foreign direct investment has a significant crowding-out effect on the domestic economy, inhibiting total economic growth; some scholars believe that foreign direct investment has no significant impact on the total economic growth of the host country.

Regarding the impact of foreign direct investment on the quality of economic growth. With the rapid growth of the global economy, the extensive production model at home and abroad has caused serious damage to the society and ecological environment. People have gradually realized that focusing on economic growth quantity only without paying attention to economic growth quality is undesirable. Therefore, more and more scholars have shifted their research direction to the impact of foreign direct investment on the quality of economic growth. Due to the use of different data and research methods, the results also differ. Some scholars believe that foreign direct investment promotes the improvement of the quality of economic growth, while some scholars believe that it has an inhibitory effect on it.

### 2.2.1. The impact of foreign direct investment on total economic growth

Wu Jian (2002) believed that foreign direct investment can promote total economic growth, and is not the cause of unbalanced regional development. Sang Xiuguo (2002) combined Chinese and foreign research methods to establish a model suitable for China and verified that foreign direct investment can promote total economic growth. Yao Shujie et al. (2006) believed that foreign direct investment has a positive effect in promoting total economic growth. Liu Hong and Li Shusheng (2013) used the VAR model and time series data of China from 1985-2010 to show that there is a two-way causal relationship between total economic growth and foreign direct investment. Zou Jianhua and Han Yonghui (2013) empirically showed that foreign direct investment is also a factor in promoting total economic growth. Chen Haibo and Zhang Yue (2014) used data from 13 cities in Jiangsu and showed that foreign direct investment has direct and indirect roles in promoting total economic growth. Han Meili et al. (2018) based on the provincial panel data from 1979-2013, using the extended C-D production function, concluded that foreign direct investment can promote long-term growth of total economy, some scholars have also studied the specific impact channels of foreign direct investment on total economic growth. Shen Kunrong and Geng Qiang (2001) believed that foreign direct investment can enhance total factor productivity through channels such as improving product technology. Chen Langnan and Chen Jinghuang (2002) verified from the perspective of total supply that foreign direct investment plays a promoting role in some variables in economic growth. Wang Zhipeng and Li Zinai (2003) used industrial sector data to show that the input of foreign investment is conducive to improving enterprise productivity.

However, some scholars have empirically proven through research that foreign direct investment has an inhibitory effect on total economy or no significant impact. Herzer (2012)

empirically proved that foreign direct investment had a negative impact on developing countries. Xue Deyu and Sun Liang (2008) used data from provinces in central China from 1993-2005 to show that foreign direct investment has negative spillover effects in central regions. Ma Lin and Zhang Kaidong (2008) used panel data from 28 provinces and regions in China from 2000-2005 to show that foreign direct investment has a significant negative spillover effect on China's economy. Zhang Huan and Xu Kangning (2015) showed that the introduction of foreign direct investment can temporarily promote total economic growth, but in the long run, it will exacerbate environmental pollution.

#### 2.2.2. The impact of foreign direct investment on the quality of economic growth

Lin Li and Lu Zhiqiang (2016) used the system GMM method for empirical research on China's provincial panel data, and the results showed that foreign direct investment promotes the improvement of the quality of China's economic growth, and this role increases with the degree of opening up. Sang Baichuan and Zhang Caiyun (2018) believed that foreign direct investment promotes China's industrialization process, industrial transformation and upgrading, and technological progress through channels to promote China's high-quality development. Wang Lijuan et al. (2019) used provincial panel data from 2006-2016 for in-depth research on how two-way foreign direct investment affects high-quality development, the results show that it has significant technology spillover effects in central regions.

But some scholars have come to the opposite conclusion, believing that foreign direct investment inhibits the improvement of the quality of economic growth. Ahmed (2012) showed that the inflow and input of foreign direct investment had a negative impact on the total factor productivity of Malaysia. Liu Shunjia (2008) used the DEA method to measure the total factor productivity of 27 provinces in China, and empirically showed that foreign direct investment promotes the improvement of domestic total factor productivity in the short term, but inhibits the improvement of domestic total factor productivity in the long run. Sui Hongguang (2017) et al. used the data of 29 provinces and cities in China for 14 years and found that foreign direct investment inhibits the quality of China's economic growth, but with the increase in the screening effect of the RMB real exchange rate, it plays a buffering role in the inhibitory effect of foreign direct investment on the quality of economic growth.

# 3. Research Design

## 3.1. Model Building

The model mainly examines the impact of foreign direct investment on the high-quality development of the Yangtze River Economic Belt. fdi represents the core explanatory variable of foreign direct investment. The actual amount of foreign investment used in the prefecture-level city is used to represent this. The control variables used in this paper include: 1. The degree of government intervention (gov). Referring to Zhao Tao (2020), this paper uses the ratio of local fiscal expenditure to local fiscal revenue to represent the government fiscal expenditure. An important means of macro-control. The use of appropriate fiscal policy tools can fill market gaps and improve the flow and allocation efficiency of various factors of production and resources, and enhance the positive externalities of the economy. Therefore, this paper selects the ratio of local fiscal expenditure to government fiscal revenue as a control variable. 2. Informatization level (infor): This data is the number of Internet users divided by local GDP that year. Since the higher the level of informatization in a region, the higher the level of science and technology development will correspond, which will more likely attract foreign investment in the local area, thus promoting local economic development. This impact will have a positive effect on the high-quality development of regional economies. 3. Urbanization level (urban), indicated by urban population density. In recent years, with the acceleration of the urbanization process in the region, the infrastructure construction of science, education, medical care, culture and other in the region has become more perfect, which will attract foreign investment in the region and thus affect local economic growth. The impact on the quality of development. 4. Level of financial development (finance), indicated by the ratio of RMB deposits in financial institutions at the end of the year to GDP.

## 3.2. Construction of High-quality Development Indicators

From a macro and micro perspective. Most scholars start from a macro perspective and elaborate on various aspects contained in high-quality development. Li Jinye and Xu Zhaokai (2017) propose that high-quality development should include effectiveness, openness, sharing, stability and sustainability in five aspects. Measure the effectiveness of high-quality development in terms of production efficiency and industrial structure transformation and upgrading; measure the openness of high-quality development in terms of foreign direct investment and foreign trade dependence; measure the sharing of high-quality development in terms of improving people's social welfare; measure the stability of high-quality development in terms of the operation status of the economy and society; measure the sustainability of high-quality development in terms of the status of ecological environment protection. Shi Dan et al. (2018) believe that high-quality development is the driving force for economic growth. The transformation of economic growth momentum, development path and industrial structure, etc. requires not only improving total factor productivity, but also achieving improvement in product quality and people's quality, providing a systematic new perspective for economic development. Shi Bo and Zhang Bingyao (2019) believe that high-quality development, compared with the stage of economic growth, is not blind pursuit of economic growth rate, but a development model with era, localization and systematic characteristics, with the focus on fostering new growth momentum, optimizing economic structure, and building a new pattern of opening up that achieves green development. Some scholars start from a micro perspective to explore the connotation of enterprise high-quality development. Huang Sujian et al. (2018) take the enterprise level as the entry point to define the concept of enterprise high-quality development. He believes that enterprise high-quality development should aim at development at a higher level, higher level and higher quality, focusing on pursuing long-term sustainable development of enterprises.

High-quality development is a comprehensive concept. To explore the connotation of high-quality development, we must cover economic, social, political, cultural, ecological civilization construction and other aspects. High-quality development includes not only the improvement of economic

quality, but also the improvement of industrial structure, ecological environment quality, people's living standards and so on. Therefore, in the research process of the level of high-quality development, we should not only study its changing process, but also explore the basic conditions at the beginning of high-quality development and the results achieved at the end.

Based on the above research, this paper establishes a multi-dimensional evaluation system composed of 4 secondary indicators: industrial structure, technological innovation, resident life and ecological environment to measure the high-quality economic development of 31 prefecture-level cities in the Yangtze River Economic Belt from 2003 to 2018. The calculated high-quality development level is referred to as gzf.

(1) Industrial structure. The transformation and upgrading of industrial structure is the focus of promoting high-quality development. In the process of transformation and upgrading, it is mainly considered whether the development between industries is coordinated and whether the development between industries is coordinated, that is, the high-endization and rationalization of industrial structure. The ratio of output value of tertiary industry to secondary industry (y1) is used to measure the high-endization of industrial structure; the rationalization of industrial structure is measured by the Tails index (y2) measured by the ratio of employment and output value among the three industries, and the calculation method of Tails index refers to Gan Chunhui (2011)'s definition of Tails index.

$$\mathrm{TL} = \sum_{i=1}^{n} \left(\frac{Y_i}{Y}\right) \ln\left(\frac{Y_i}{L_i} \Big/ \frac{Y}{L}\right)$$

Where Y indicates output value, L indicates employment, I indicates industries, n represents the number of industrial sectors.

(2) Technological innovation. Innovation is a powerful engine for high-quality development. Especially for cities, innovation capability is a decisive factor in the quality of economic development. Technological innovation is the most direct type of innovation activities that affect the quality of economic development. The traditional urban innovation capability indicators mostly use only the number of various patents, which has the problem of single measurement dimension. Without strengthening the comprehensiveness and comprehensiveness of indicators, this paper selects the China Regional Innovation and Entrepreneurship Index (y3). This set of indicators objectively reflects the innovation and entrepreneurship activities at the city level in China. This set of indicators has the following three characteristics: First, it examines the actual output of innovation and entrepreneurship of enterprises within the region, rather than input, thus forming a more objective and true evaluation of innovation and entrepreneurship; Second, use the "full amount" data of large enterprise databases, including all industries and scales of enterprises in mainland China, especially covering small, medium and micro enterprises and start-up enterprises with high innovation activity; Third, organically link the originally scattered data in technology, human, investment and other fields, and unify them from the perspective of "enterprises" for classification, covering multi-dimensional comprehensive evaluation indicators that can reflect innovation and entrepreneurship in different aspects.

(3) Ecological environment. The construction of ecological civilization is both a condition and an important achievement of high-quality development. The report of the 20th National Congress points out that to comprehensively promote the great rejuvenation of the Chinese nation with Chinese-style modernization, harmonious coexistence between man and nature is one of the five features of Chinese-style modernization. Adhering to green development and reducing pollutant emissions is one of the main threads of our economic policies that we will continue to implement after the 20th National Congress. The comprehensive utilization rate of industrial solid waste (y4) and the centralized treatment rate of sewage treatment plants (y5) are selected as secondary indicators to reflect the main investment status and results of each prefecture-level city in environmental governance.

(4) Residents' living standards. Development must adhere to people-centered, and the happiness of the people is the foothold of economic development. Therefore, this paper places residents' living standards in the final position of high-quality development indicators. The quality of economic development is ultimately felt and reflected by people and people's living standards. In addition to economic indicators such as wealth consumption, the quantity and quality of public services such as education and medical care are also closely related to the happiness of the people. Therefore, this paper selects per capita GDP (y6), science and technology expenditure: education expenditure (y7), number of hospital beds (y8) as secondary indicators under the resident living standard dimension.

The following Table 1 is the evaluation system of high-quality development indicators in this paper.

**Table 1.** High-quality Development Indicators

| First-level indicators | Second-level indicators | |
|---|---|---|
| Industrial structure | Ratio of output value of tertiary industry to secondary industry | $y_1$ |
| | Tails index | $y_2$ |
| Technological innovation | China Regional Innovation and Entrepreneurship Index | $y_3$ |
| Ecological environment | Comprehensive utilization rate of industrial solid waste | $y_4$ |
| | Concentrated treatment rate of sewage treatment plants | $y_5$ |
| Residents' living standards | Per capita GDP | $y_6$ |
| | Science and technology expenditure: education expenditure | $y_7$ |
| | Number of hospital beds | $y_8$ |

### 3.3. Data Sources

This paper conducts research on the panel data of 31 prefecture-level cities in the Yangtze River Economic Belt from 2003 to 2018. Except that the data source of the China Regional Innovation Entrepreneurship Index comes from the Peking University Open Research Data Platform, and the population density data from 2016 to 2018 is missing, calculated based on the population data in the China Urban Statistical Yearbook. Other data comes from the China City Statistical Yearbook and Guotai'an database.

## 4. Empirical Research on the Impact of FDI on High-quality Development

### 4.1. Descriptive Statistics

Table 2 is a descriptive statistical result of the main variables in this paper. There are 504 observations in this paper. The average value of the high-quality development index (gzf) of the Yangtze River Economic Belt is 0.256, with a maximum value of 0.878 and a minimum value of 0.0507, indicating that the quality of economic development varies greatly among different cities in the Yangtze River Basin. The government intervention degree (gov), informatization level (infor), and financial development level (finance) all show characteristics of "small mean and large standard error". From the control variables, there are also significant differences in the degree of regional government intervention (gov), informatization level (infor), and financial development level (finance) in different prefecture-level cities along the Yangtze River, especially with significant differences in informatization levels.

**Table 2.** Descriptive statistical results of variables

| | Variable | N | mean | sd | min | max |
|---|---|---|---|---|---|---|
| Control variables | Gov | 504 | 1.831 | 0.831 | 0.649 | 4.967 |
| | Infor | 504 | 3.702 | 2.230 | 0.889 | 30.14 |
| | Unban | 504 | 598.0 | 384.2 | 52.73 | 2,295 |
| | Finance | 504 | 1.441 | 0.598 | 0.498 | 4.130 |
| Explained variable | Gzf | 504 | 0.256 | 0.153 | 0.0507 | 0.878 |
| Explanatory variable | FDI | 504 | 176,998 | 294,967 | 8 | 1.851e+06 |

**Table 3.** Correlation coefficient matrix

| | Gzf | FDI | Gov | Infor | Unban | Finance |
|---|---|---|---|---|---|---|
| Gzf | 1 | | | | | |
| FDI | 0.579 | 1 | | | | |
| Gov | -0.338 | -0.699 | 1 | | | |
| Infor | 0.231 | 0.00480 | 0.138 | 1 | | |
| Unban | 0.570 | 0.541 | -0.452 | 0.118 | 1 | |
| Finance | 0.602 | 0.500 | -0.284 | 0.348 | 0.480 | 1 |

Correlation coefficient matrix analysis In order to determine whether there is a serious multicollinearity problem between variables, it is necessary to calculate the correlation coefficients between variables. The specific results are shown in Table 3. It can be seen from the table that except for the correlation coefficient between Finance and gzf variables exceeding 0.5, the correlation coefficients between the remaining variables are below 0.5. Therefore, it can be judged that there is no multicollinearity problem. After calculating the variance expansion factor VIF of each variable, it can be found that it is far less than the empirical value 10, so it can also be determined that there is no multicollinearity problem.

### 4.2. Model Setting

Since the panel data of 31 prefecture-level cities from 2003-2018 are selected in this paper, and the economic development quality of cities with higher economic development is also prioritized, in order to avoid the endogeneity problem brought by this sample data, Hausman test is used to judge whether to use fixed effect model or random effect model. First, a joint significance test of individual effects and random effects is performed. As shown in Table 4 below, the p-value of the fixed effect test is less than 0.01, indicating that the individual effect is significant. According to the random effect test results, the p-value is less than 0.05, indicating that the random effect is significant. The results of the Hausman test show that under the original hypothesis that the fixed effect is redundant, it can be seen from Table 4 that the original hypothesis is rejected at the 1% confidence level, so the fixed effect model is appropriate in this paper. The model expression used in this paper is as follows:

$$gzf_{it} = \alpha + \beta_0 FDI_{it} + \beta_1 \mathrm{gov}_{it} + \beta_2 \mathrm{infor}_{it} + \beta_3 \mathrm{urban}_{it} + \beta_4 \mathrm{finance}_{it} + \varepsilon$$

Among them, gzf_(it) represents the high-quality development index of the i-th prefecture-level city in year t, FDI_(it) represents the foreign direct investment index of the i-th prefecture-level city in year t, gov_(it) represents the degree of government intervention in the i-th prefecture-level city in year t, infor_(it) represents the informatization level of the i-th prefecture-level city in year t, urban_(it) represents the urbanization level of the i-th prefecture-level city in year t, finance_(it) represents the financial development level of the i-th prefecture-level city in year t. ε is a random error term.

### 4.3. Empirical Results and Analysis

Through the fixed effect, the panel data was regressively estimated by OLS, and the results are shown in the following

table. It can be seen from the table below that the estimated coefficient of the core explanatory variable FDI is significantly positive, and FDI promotes the high-quality development of prefecture-level cities in the Yangtze River Basin. In terms of control variables, the degree of government intervention (gov) is insignificantly positively correlated with high-quality development, indicating that government intervention factors have not played an effective role in high-quality development in this model. The informatization level (infor) and urbanization level (Urban) also failed to pass the 10% significance test, the latter being negative, meaning that urban scale expansion is not conducive to improving the quality of local economic growth. As for the level of financial development (Finance), it is positively correlated with economic development quality and remains significant at the 1% level, indicating the importance of building a high-level capital market in improving the quality of regional economic development. Without adding control variables, foreign direct investment has a significant positive impact on economic high-quality development. Every 1% increase in foreign direct investment will promote local economic high-quality development by 0.013%, indicating that in the process of economic transformation to high-quality development in the Yangtze River Basin, appropriate introduction of FDI should be introduced to promote local economic high-quality development.

**Table 4.** Hausman Test

| |
|---|
| TestofH0: Differenceincoefficients not systematic |
| chi2(5) =(b-B)'[(V_b-V_B)^(-1)](b B) =289.70 |
| Prob>chi2 =0.0000 |
| (V_b-V_Bis notpositivedefinite) |

**Table 5.** Full sample regression results

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| VARIABLES | y | y | y | y | y |
| FDI | 0.013*** | 0.013*** | 0.013*** | 0.013*** | 0.025*** |
| | (3.19) | (3.20) | (3.21) | (3.21) | (6.14) |
| gov | | -0.002 | -0.000 | -0.000 | 0.004 |
| | | (-0.26) | (-0.01) | (-0.01) | (0.49) |
| infor | | | -0.003 | -0.003 | -0.001 |
| | | | (-1.54) | (-1.54) | (-0.58) |
| unban | | | | -0.000 | -0.000 |
| | | | | (-0.26) | (-0.04) |
| finance | | | | | 0.122*** |
| | | | | | (-8.32) |
| Constant | 0.116*** | 0.120** | 0.125*** | 0.128*** | 0.160*** |
| | (2.62) | (2.55) | (2.64) | (2.61) | (3.47) |
| Observations | 496 | 496 | 496 | 496 | 496 |
| R-squared | 0.022 | 0.022 | 0.027 | 0.027 | 0.154 |
| Numberofid1 | 31 | 31 | 31 | 31 | 31 |
| idFE | YES | YES | YES | YES | YES |

The economic development and industrial structure along the Yangtze River Basin are imbalanced. The economic aggregate, industrial added value, local fiscal revenue, total social fixed asset investment and other indicators of the Jiangsu, Zhejiang and Shanghai areas in the lower reaches of Yangtze River far exceed those of the central cities such as Hefei and Wuhan in the mid-reaches, and are greater than the total of provinces such as Yunnan, Sichuan and Guizhou. Based on this uneven state of development, subsample regressions were performed on the upper, middle and lower reaches of the Yangtze River, respectively.

It can be seen from the results of the subsample regression in Table 6 that except that foreign direct investment does not have a significant role in promoting economic quality development in the lower reaches, foreign direct investment has a significant positive impact on economic high-quality development in the middle and upper reaches. In the underdeveloped upper reaches of the Yangtze River, the impact of FDI on high-quality economic development is very significant. The reason may be that the economic development level in the upstream region is relatively low, the economic foundation is relatively weak, and the promotion elasticity of foreign investment to the economy is large. As long as there is FDI participation, it can provide high-quality corporate management methods, technological levels and more effective information. The weak industry in the upper reaches can develop rapidly. More cities in the upstream are resource-oriented cities, and the economic output value of such cities depends more on the exploitation and processing of natural resources such as minerals and forests. Relying on the technology brought by foreign direct investment, my country is a major exporter of minerals, relying on the huge market demand in the world, FDI can promote the pace of cities in the upper reaches of the Yangtze River to "go global".

In addition, Li Qiang (2019) pointed out that FDI has a significant negative impact on environmental pollution in the

Yangtze River Economic Belt, indicating that FDI is conducive to solving environmental pollution issues in the Yangtze River Basin. The practical significance of this conclusion is that with the deepening development of economic globalization, the influence of multinational corporations on the economic development of countries around the world is expanding. The international division of labor has gradually expanded from the division of labor between industries and products to the division of labor within products. For China, participating in the international division of labor and leaping to the high end of the global value chain is the inevitable choice for the in-depth development of China's economy, which is also conducive to the continuous optimization of the ecological environment. The impact of FDI on the high-quality economic development of the middle and lower reaches is not prominent. The reason may be that in the early stage of reform and opening up, the eastern coastal cities that opened up first received foreign direct investment and the economy developed rapidly. With the deepening of reforms, the advanced management experience and technology brought by foreign direct investment are being continuously internalized by the coastal cities along the river in Jiangsu, Zhejiang and Shanghai, and the scale effect is diminishing. In 2021, the GDP of the Yangtze River Delta region will reach 27.6 trillion yuan, accounting for 24.1% of the country, R&D expenditure accounting for 29.8% of the country, total import and export volume reaching 14.1 trillion yuan, accounting for 36.1% of the country. With such economic scale and development level, the role of foreign direct investment in promoting high-quality economic development in the middle and lower reaches of the Yangtze River will gradually weaken.

**Table 6.** Test of regional heterogeneity of FDI impact on high-quality development

| VARIABLES | Lower reaches Gzf | Middle reaches Gzf | Upper reaches Gzf |
|---|---|---|---|
| FDI | 0.007 | 0.014*** | 0.041*** |
| | (0.53) | (2.97) | (5.97) |
| gov | -0.168*** | 0.010 | 0.013 |
| | (-2.89) | (0.78) | (1.11) |
| infor | 0.003 | -0.004 | -0.007** |
| | (1.36) | (-1.53) | (-2.10) |
| unban | -0.000 | 0.000 | -0.000 |
| | (-0.74) | (0.70) | (-0.34) |
| finance | -0.125*** | -0.126*** | -0.028 |
| | (-4.71) | (-5.41) | (-0.90) |
| Constant | 0.670*** | 0.188*** | -0.080 |
| | (4.08) | (3.55) | (-1.00) |
| Observations | 176 | 208 | 112 |
| R-squared | 0.209 | 0.236 | 0.287 |
| Numberofid1 | 11 | 13 | 7 |
| idFE | YES | YES | YES |

# 5. Robustness Test

## 5.1. Variable Replacement

The first robustness test method used in this paper is to replace the core explanatory variable. The amount of actual foreign investment used in the region that year can reflect the intensity of foreign direct investment in the region, but relying solely on the total amount of foreign capital used for model estimation is somewhat one-sided. Although the total amount of foreign direct investment used in the southwest along the upper reaches of the Yangtze River is small, the number of foreign-invested enterprises is still considerable. Therefore, considering the availability of data, this paper chooses the number of foreign-invested enterprises as an alternative variable of the core explanatory variable FDI to regress from the perspective of the number of foreign-invested enterprises. The regression results are shown in Table 7. The regression results show that when the core explanatory variable is replaced with the number of foreign-invested enterprises, it also significantly promotes the level of high-quality development, and the model is robust.

## 5.2. IV Estimation

The fixed effect regression model in this paper may have omitted variable problems, so the estimation may not be consistent estimation. Therefore, the iv estimation method is continued to solve the endogeneity problem that may be caused by omitted variables. For the core explanatory variable FDI, considering that the amount of actual foreign capital used in the previous year is completely exogenous to the high-quality development level of the current year, we use the one-order lag variable of the actual amount of foreign capital used as an instrumental variable for regression, and the regression results are shown in Table.

# 6. Conclusions and Deficiencies

## 6.1. Conclusions

The report of the 20th National Congress points out that China's economy is facing the transition from a stage of rapid economic growth to a stage of high-quality economic development. In the process of reform and opening up over the past 40 years, foreign direct investment has not only increased capital supply and labor demand, but also promoted China's economic growth and development. In order to quantify and analyze the high-quality economic development of cities along the Yangtze River Economic Belt, this paper takes the data of 31 provinces and cities along the Yangtze River as sample data, and constructs an economic high-

quality development index from four dimensions. On this basis, it analyzes the impact effect on the high-quality economic development of prefecture-level cities, and considers the differences in the impact of FDI on the high-quality economic development of different regions, and uses subsample regression to examine them one by one. Based on the regression results and regional economic characteristics, it explores the impact mechanism of foreign direct investment on the economic development of different river basins, and provides references for the high-quality development of regional economies in the Yangtze River Basin and the basis for government policy making.

The empirical results of this paper provide policy makers with many implications. Different focuses should be placed according to different regions in the context of economic transformation.

First of all, it can be seen from the full sample analysis results that the inflow of foreign direct investment has a positive role in promoting the high-quality development of the entire Yangtze River Basin. This shows that this positive foreign capital spillover effect is a phenomenon across the basin, because foreign direct investment can improve China's overall technological innovation capability, and can bring advanced management concepts and information technology levels to China's development, which are all conducive to the overall improvement of China's Comprehensive strength promotes China's economic development. Therefore, under the overall environment of the country, we should continue to encourage expanded market access conditions for foreign investment, actively introduce foreign capital, and make adequate preparations for the transformation of China's economy towards high-quality development to steadily improve the progress of China's economic transformation towards high-quality development. In the context of economic globalization, only by continuously improving innovation capabilities can we be competitive on the international stage. Talent is the main source of this competitiveness. Faced with the continuous progress of social productive forces, the demand for high-end talents in the Yangtze River Economic Belt is also increasing day by day. The Yangtze River Economic Belt should increase fiscal expenditure on higher education, strengthen the cooperation between enterprises, colleges and research institutes, and train and select professional high-end talents needed by various industrial chains in society. At the same time, we must strengthen the introduction of talents in the upper reaches of the Yangtze River Economic Belt, improve the introduction, evaluation and protection system for talents, ensure that talents in all regions do not fall behind, continue to motivate their abilities and vitality, and enable talents to continuously innovate and progress in economic and social areas, and achieve comprehensive and high-quality development of the economy and society in the Yangtze River Economic Belt.

Secondly, it can be seen from the regression results of the regions that the impact of FDI on the upper, middle and lower regions is different. The role of promoting economic quality development in the Yangtze River Delta region is not significant, but it will play a role in promoting quality development in the middle and upper reaches. Therefore, for the economically developed areas of the Yangtze River Delta, the local government should slow down the speed of introducing foreign capital and control the stock of foreign capital in the local area; for the middle and upper reaches, while continuing to actively introduce foreign direct investment, urbanization can be continuously promoted. Development process, increase local government spending levels. Only by making corresponding adjustments and changes according to the actual situation of the region's own development can we better promote the transformation of the region's economy towards high-quality development, and accelerate the realization of China's overall economic transformation goals.

## 6.2. Deficiencies and Prospects

This paper selects the panel data of prefecture-level cities in the Yangtze River Economic Belt from 2003 to 2018, and uses the fixed effect model to empirically study the impact of foreign direct investment on the high-quality development of the Yangtze River Economic Belt, but there are the following deficiencies:

(1) In terms of data selection, this paper uses macro panel data of prefecture-level cities along the Yangtze River Economic Belt, and insufficient data may lead to bias in the results. In future research, micro data at the enterprise level can be adopted to make the empirical results more accurate.

(2) In terms of model selection, this paper uses static panel data, and does not take into account the lag of high-quality development in the Yangtze River Economic Belt. Many current studies have shown that high-quality development is a long-term accumulation process, and the high-quality development level in the previous period is one of the important factors affecting the high-quality development level in the later period. Therefore, in future research, the lag item of high-quality development level can be added to conduct regression analysis using dynamic panel data, making the empirical model more complete and comprehensive.

(3) This paper only studies the linear impact of foreign direct investment on the high-quality development of the Yangtze River Economic Belt, and does not consider the lagging impact and nonlinear impact of foreign direct investment on the high-quality development of the Yangtze River Economic Belt. Therefore, in future research, we can appropriately add lag items, quadratic terms and other variables of foreign direct investment to further explore whether there is a non-linear impact of foreign direct investment on the high-quality development of the Yangtze River Economic Belt.

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