

Research on the Impact of Foreign Direct Investment on the Urban-Rural Income Gap in Zhejiang Province

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ABSTRACT

In the context of the global economy, this paper examines the impact of foreign direct investment (FDI) on the urban-rural income gap in 11 cities of Zhejiang Province from 2011 to 2022. The study finds that FDI can reduce the urban-rural income disparity, and this conclusion remains valid after a series of tests. This research provides insights on how to leverage foreign investment to achieve coordinated urban-rural economic development and comprehensive improvement of income levels.

KEYWORDS

Foreign Direct Investment (FDI); Urban-Rural Income Gap; Bidirectional Fixed Effects

1 Introduction

In recent years, with the continuous development of the global economy and the increasing prosperity of international trade, Foreign Direct Investment (FDI) has become an important driving force for countries and regions to achieve economic growth and promote industrial upgrading. As a strong economic province in eastern China, Zhejiang Province has gradually attracted the attention of academia and policymakers in its efforts to attract foreign investment. FDI not only brings capital and technology to the local economy but also promotes economic interaction and industrial layout between regions, forming a new driving force for regional economic development.

However, alongside the rapid economic development in our country, the issue of the urban-rural income gap has become increasingly prominent, posing a significant challenge to the sustainable development of the socio-economy. According to statistical data, although the income gap between urban and rural residents in Zhejiang Province has shown a trend of narrowing in recent years, it remains significant, severely affecting social equity and harmony. In this context, exploring the impact of foreign direct investment on the urban-rural income gap holds important theoretical and practical significance. Existing research has mostly focused on the impact of FDI on economic growth, employment, and other aspects, while the specific mechanisms of its effect on the urban-rural income gap are relatively scarce. By analyzing the economic benefits brought by FDI, changes in industrial structure, and its role in promoting rural economies, we can gain a deeper understanding of how to narrow the urban-rural income gap through guiding and optimizing the utilization of foreign capital in the context of economic globalization. Additionally, exploring the regional effects of FDI and the impact of investments in different sectors on income disparity is also of great significance for policymakers to adjust investment strategies and optimize the structure of foreign capital. This study will focus on the current situation of foreign direct investment in Zhejiang Province and its impact on the urban-rural income gap.

2 Literature Review

2.1 The Impact of FDI on the Urban-Rural Income Gap

In recent years, many scholars have conducted extensive research on the impact of FDI on the urban-rural income gap, and their views vary. The first viewpoint argues that there is an inverted U-shaped relationship between FDI and the urban-rural income gap in our country, suggesting that a higher dependence on foreign capital leads to a larger income gap, while a lower dependence results in a smaller gap. When urban development reaches the right side of the inverted U-shape, it is essential to actively improve the level of foreign capital utilization, transform the existing economic development model, and promote the optimization of the urban-rural income structure (He Feng and Xu Guilin, 2009; Shen Yingyu and Zhang Erzhen, 2011). However, some scholars believe that this inverted U-shaped relationship is uncertain, and as the degree of openness in our country further increases, the rise in FDI may lead to an expansion of the urban-rural income gap (Li Guixian, 2012).

The second viewpoint holds that an increase in FDI is beneficial for suppressing the urban-rural income gap, as foreign direct investment can be tailored to local development conditions, effectively improving the efficiency of resource allocation in the area (Ma Yugang, 2022). The third viewpoint argues that an increase in FDI expands the urban-rural income gap, as the continuous optimization of industrial structure and the improvement of human capital levels lead to a

decreased demand for low-skilled labor, resulting in a positive correlation between the two (Huang Wen et al., 2017). The impact of FDI on the urban-rural income gap exhibits regional characteristics.

2.2 The Mechanism of FDI's Impact on the Urban-Rural Income Gap

The impact of Foreign Direct Investment (FDI) on the urban-rural income gap is characterized by uncertainty. Previous studies indicate that FDI primarily affects the urban-rural income gap through technological advancement, employment structure, industrial structure, trade changes, and industrial agglomeration (Wei Kailei et al., 2014). FDI is typically concentrated in urban areas, driving local economic development by creating job opportunities and increasing wage levels, which directly enhances the income levels of urban residents. Goux and Maurin (2000) pointed out that FDI increases the income disparity between skilled and unskilled workers. Foreign-funded enterprises often introduce advanced technologies and management practices, promoting industrial upgrading and further attracting labor and capital inflows into cities, which leads to relative stagnation in rural areas.

Finally, the spillover effects of foreign investment, combined with regional development policies, also influence whether the income gap narrows or widens. Therefore, while FDI promotes urban economic growth, it may deepen the urban-rural income gap in the short term, necessitating policy regulation to achieve more balanced regional development. Most research on the impact of FDI on the urban-rural income gap in our country has focused on different countries or provincial levels.

This paper will consider the disparities among the 11 cities in Zhejiang Province, analyzing specific issues relevant to the province. With the continuous development of cross-border e-commerce in recent years, this presents a significant opportunity for Zhejiang Province, making it crucial to utilize foreign investment effectively. Given the differences in research methods and perspectives among various scholars, this paper will build on previous studies and approach the issue from the practical perspective of Zhejiang Province, exploring the specific impact of FDI on the urban-rural income gap through empirical research.

3 Research Design

3.1 Sample Selection and Data Sources

This study selects Zhejiang Province as the sample and constructs a panel dataset from 2011 to 2022. After screening, a total of 132 samples from 11 prefecture-level cities in Zhejiang Province for the years 2011 to 2021 were obtained. The data primarily comes from the "Zhejiang Statistical Yearbook" and the annual local "Statistical Yearbooks" of the prefecture-level cities. Empirical analysis is conducted using STATA 16 and Excel software.

3.2 Variable Definition

Based on relevant domestic and international research, as well as the analysis presented earlier, this empirical section of the study uses the income gap (IG) in Zhejiang Province as the dependent variable, with the actual Foreign Direct Investment (FDI) in Zhejiang Province as the core independent variable. Additionally, five control variables are included: regional economic development level (RGDP), industrial structure (IS), degree of openness (OPEN), level of government intervention (FE), and urbanization level (URB). The specific meanings and descriptions of each variable are shown in Table 1.

Table 1 Variable Definitions

Variable Name	Variable Symbol	Variable Definition
Urban-Rural Income Gap	IG	Urban per capita disposable income of local residents/ Per capita disposable income of farmers
Foreign Direct Investment	FDI	Foreign direct investment in the local area/ Local GDP
Industrial Structure	IS	(Local secondary industry + tertiary industry)/ Local GDP
Degree of Openness	OPEEN	Total foreign trade of the local area/ Local GDP
Government Intervention Level	FE	Local government expenditure/ Local GDP
Urbanization Level	URB	Urban population of the local area/ Total population of the local area
Regional Economic Development Level	RGDP	Local per capita GDP

3.3 Model Construction

In order to examine the impact of Foreign Direct Investment (FDI) on the urban-rural income gap in Zhejiang Province,

this study references the model established by Gao Feixiang (2023) with slight modifications, ultimately constructing the econometric model ($T=12$, $N=11$):

$$IGit = \beta_0 + \beta_1 FDIit + \beta_2 RGDPit + \beta_3 ISit + \beta_4 OPENit + \beta_5 URBit + \beta_6 FEit + \lambda_i + \sigma_t + \varepsilon_{it}$$

where i represents the prefecture-level cities in Zhejiang Province, t represents the year, λ denotes the unobservable regional individual effects, and σ_t represents the time effects.

4 Empirical Analysis

4.1 Descriptive Statistics and Correlation Analysis

Table 2 presents the descriptive statistics of the main variables.

From the results in Table 2, it can be seen that the average urban-rural income gap from 2011 to 2022 is 1.955, with a standard deviation of 0.269, a maximum value of 2.995, and a minimum value of 1.558. This indicates that there is a significant urban-rural income gap in Zhejiang Province, while the disparities among prefecture-level cities are relatively small.

The average FDI is 0.017, suggesting that the overall amount of foreign investment in Zhejiang Province is low, with a maximum value of 0.053 and a minimum value of 0.011, indicating a high disparity in FDI among the prefecture-level cities. Descriptive Statistics and Correlation Analysis.

Table 2 Descriptive Statistics

VarName	Obs	Mean	SD	Min	Median	Max
IG	132	1.955	0.269	1.558	1.912	2.995
FDI	132	0.017	0.014	0.001	0.011	0.053
IS	132	0.949	0.024	0.885	0.955	0.982
OPEN	132	0.512	0.288	0.157	0.416	1.733
FE	132	0.153	0.060	0.076	0.135	0.357
URB	132	0.652	0.076	0.448	0.657	0.840
RGDP	132	88534.621	32017.980	30643.000	83036.500	1.67e+05

4.2 Regression Analysis

The regression results of Foreign Direct Investment (FDI) on the urban-rural income gap are shown in Table 3. FDI is significantly and negatively correlated with the urban-rural income gap at the 1% level, indicating that FDI can help reduce the urban-rural income gap, provide more employment opportunities, enhance supporting industrial facilities, and improve the optimal allocation of resources, thereby promoting balanced economic development between urban and rural areas.

Table 3 Basic Regression Results

		(1)
VARIABLES		IG
	FDI	-5.817*** (-5.69)
	IS	-0.809 (-0.99)
	OPEN	-0.025 (-0.60)
	FE	-2.331*** (-7.71)
	URB	0.432* (1.77)
	RGDP	-0.000*** (-4.16)
	Constant	3.356*** (4.18)
	Observations	132
	Number of city	11
	R-squared	0.893
	Year FE	Yes
	Code FE	Yes

Note: t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3 Robustness Check

To ensure the robustness of the econometric results obtained, this study gradually introduces control variables during the empirical research, observing the changes in the coefficients of the explanatory variables in order to minimize the impact of omitted variables. The regression results are shown in the table below.

Table 4 Robustness Analysis Results

	(1)	(2)	(3)	(4)	(5)	(6)
FDI	-5.146** (2.223)	-6.710*** (2.273)	-5.109** (2.277)	-4.920** (1.883)	-6.546*** (1.454)	-4.358*** (1.214)
IS		-3.230** (1.332)	-3.976*** (1.320)	-0.172 (1.205)	-4.787*** (1.053)	-2.095** (0.922)
OPEN			-0.228*** (0.080)	-0.183*** (0.066)	-0.232*** (0.051)	0.036 (0.054)
URB				-2.597*** (0.348)	-0.525 (0.351)	0.132 (0.297)
FE					-3.553*** (0.390)	-2.869*** (0.328)
RGDP						-0.000*** (0.000)
_cons	2.043*** (0.042)	5.136*** (1.276)	5.933*** (1.270)	3.991*** (1.082)	7.614*** (0.920)	4.853*** (0.827)
N	132.000	132.000	132.000	132.000	132.000	132.000
r2	0.043	0.088	0.147	0.422	0.663	0.780
year	YES	YES	YES	YES	YES	YES
city	YES	YES	YES	YES	YES	YES

Note: *t* statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

From the table of Model (1), we can see that when FDI is the only explanatory variable, its estimated coefficient is -5.146, which is significant at the 5% level, indicating that as Foreign Direct Investment increases, the urban-rural income gap gradually narrows. When considering the industrial structure, the estimated coefficients of FDI show significant fluctuation, with a coefficient of -6.710, which is also significant at the 1% level. As additional control variables such as the level of openness and the level of urbanization are gradually added, it can similarly be observed that the estimated coefficient for FDI exhibits only minor fluctuations.

4.4 Heterogeneity Test

Considering the varying levels of economic development and the ability to attract foreign investment across different cities in Zhejiang Province, it is necessary to study the role of Foreign Direct Investment (FDI) in different regions of Zhejiang. To this end, this study adopts the classification by Wei Yunying (2022), which divides Zhejiang Province into two regions: one region where foreign investment is primarily concentrated, and another region where it is not. The specific division is detailed in Table 5.

Table 5 Zhejiang Province Regional Division Table

Area	City
Major Foreign Investment Distribution Areas	Hangzhou, Ningbo, Jiaxing
Non-Major Foreign Investment Distribution Areas	Wenzhou, Huzhou, Shaoxing, Jinhua, Quzhou, Zhoushan, Tai zhou, Lishui

The regression results are as follows.

A comparison of the significance of Foreign Direct Investment (FDI) distribution areas and non-FDI distribution areas within Zhejiang Province reveals that the estimated coefficients for FDI in both regions passed the significance tests. However, the significance level in the non-FDI distribution area is better than that in the FDI distribution area; the former is significant at the 5% level, while the latter is significant at the 1% level. From the results, there is a notable difference in the estimated coefficients of FDI between the two major regions. The estimated coefficient for the non-FDI distribution area is -7.724, indicating that the impact of the non-FDI distribution area on the urban-rural income gap is more pronounced. The reasons for this are: First, in the main distribution area of FDI, the stock of FDI attracted has already reached a high level, which places it on the right side of the inverted U-shaped curve. In contrast, the other region is still on the left side of the curve, so its economic effect is better than that in the main distribution area of FDI. Second, from the perspective of labor costs, the overall level of economic development in the main FDI distribution area is also higher. With rapid economic development, labor costs will continuously increase. Conversely, in the non-FDI distribution area, it is easier to attract local investment and accommodate the transfer of foreign capital, and labor is comparatively cheaper.

Table 6 Heterogeneity Analysis Results

	the Entire Province	Major FDI Distribution Areas	Non-Major FDI Distribution Areas
VARIABLES	IG	IG	IG
FDI	-5.817*** (-5.69)	-1.986** (-2.65)	-7.724*** (-6.28)
IS	-0.809 (-0.99)	0.460 (0.44)	-4.256*** (-2.89)
OPEN	-0.025 (-0.60)	0.169 (1.28)	-0.095** (-2.46)
FE	-2.331*** (-7.71)	0.272 (0.45)	-3.177*** (-6.22)
URB	0.432* (1.77)	-0.388 (-1.36)	0.319 (1.05)
RGDP	-0.000*** (-4.16)	-0.000 (-0.81)	-0.000*** (-4.53)
Constant	3.356*** (4.18)	1.654* (1.75)	6.756*** (4.44)
Observations	132	36	96
R-squared	0.893	0.997	0.952
Year FE	Yes	Yes	Yes
Code FE	Yes	Yes	Yes

Note: *t* statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

This study uses data from prefecture-level cities in Zhejiang Province from 2011 to 2022 to examine the impact of Foreign Direct Investment (FDI) on the urban-rural income gap. The research finds that FDI can reduce the urban-rural income gap and passes the robustness check, confirming the conclusion. Further analysis reveals that there are differences in the relationship between FDI and the urban-rural income gap in the main and non-main FDI distribution areas. In the non-main FDI distribution area, the effect of FDI on narrowing the urban-rural income gap is more significant. As an important driving force for economic growth, FDI can influence the urban-rural income gap to a certain extent. Against the backdrop of a gradually widening urban-rural income gap in China, it is essential to continuously optimize the structure of FDI, prioritize attracting foreign investment projects that require high labor demand, such as high-tech and green industries, and encourage enterprises to invest in rural areas and small towns. By implementing preferential policies and tax incentives, local governments can promote foreign-funded enterprises to establish production bases in urban-rural junctions or impoverished areas, thereby driving local employment and income growth. Local governments should enhance the promotion and implementation of foreign investment policies, establish one-stop service platforms, simplify investment procedures, and lower the barriers for foreign investment entry. Additionally, they should encourage regions to develop local policies tailored to their unique characteristics to attract FDI, such as "free trade pilot zones," to draw in foreign capital. To ensure that FDI genuinely promotes equitable urban-rural development, the government needs to strengthen the supervision of foreign-funded enterprises to ensure they fulfill their social responsibilities.

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