Study on the Impact of Outward Foreign Direct Investment on Labor Income—An empirical study based on the provinces along China's “Belt and Road”

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Abstract: With the implementation of China's “the Belt and Road” Initiative, foreign direct investment, as an important mode of international economic cooperation, has had a significant impact on the employment growth of Chinese provinces. This paper selects the provinces along China's “the Belt and Road” as the research objects, and conducts an empirical study through the panel data of 17 provinces from 2005 to 2022 to explore the influence mechanism of foreign direct investment on labor income. The research results show that: First, foreign direct investment has a significant positive impact on the growth of labor income, and the degree of impact is related to factors such as the regional economic development level and the regional wage level. Second, the level of foreign direct investment has heterogeneity in the labor income enhancement effect of the provinces along China's “the Belt and Road”, and its promoting effect on the labor income in the less - developed regions of China is more significant. Therefore, the development of foreign direct investment should be continuously promoted to steadily achieve the goal of high - level opening - up. At the same time, multinational enterprises need to utilize the development platform of “the Belt and Road” to improve their innovation capabilities and enhance their international competitiveness, so as to further promote and improve the level of labor income in China.

1. Introduction

Employment plays a key role in promoting economic and social development and ensuring people's wellbeing. In China's modernization process, creating more high-quality jobs is seen as a crucial strategic task. The implementation of the employment-first policy is an important measure taken to promote high-quality full employment. It is also an important pillar to support the new development pattern and high-quality development. Since the 18th National Congress of the Communist Party of China, the CPC Central Committee has paid great attention to people's livelihood and high-quality employment. General Secretary has stressed many times: “Labor is the most precious thing for people's livelihood. We must adhere to the employment-first strategy and the proactive employment policy to ensure higher quality and fuller employment opportunities." Achieving high-quality full employment will help improve people's welfare, thus promoting the Chinese-style modernization drive.

China has rich human resources, with a labor force population of nearly 900 million, of which more than 240 million people have received higher education. Promoting high-quality full employment is of great practical significance for giving full play to the potential of population and resources, stimulating social vitality and creativity, making full use of the dividend of population and talent, and improving total factor productivity. The core of modernization lies in the modernization of the people. We must devote ourselves to promoting equity in employment, adhere to the concept of people-centered development, continue to pay attention to employment, the most basic issue of people's livelihood, implement the strategy of giving priority to employment, and promote high-quality full employment.

Since the reform and opening-up, China has been committed to improving the level of opening-up. According to the Statistical Bulletin of China's outward Direct Investment in 2022, by 2022, China's cumulative outward direct investment had reached US $163.12 billion, ranking second in the

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world. With the proposal of the "Belt and Road" initiative in 2013, China's outward direct investment has grown rapidly. According to the disclosure of the Ministry of Commerce, from 2013 to 2019, the total direct investment of non-financial enterprises in countries along the Belt and Road routes has exceeded US $100 billion, with an average annual growth rate of 4.4%, 1.4 percentage points higher than the national average. In October 2023, The State Council Information Office issued a white paper titled Jointly Building Belt and Road: Major Practices in Building a Community with a Shared Future for Mankind, which comprehensively summarizes the remarkable achievements of the Belt and Road initiative over the past decade. In terms of trade and investment, China has actively participated in trade and investment cooperation with countries along the Belt and Road, achieving mutual benefit and win-win results. China has successfully held five China International Import Expo and promoted the establishment of the Asian Infrastructure Investment Bank and the Silk Road Fund. From 2013 to 2022, China's total trade with countries that have established diplomatic ties along the Belt and Road routes has reached US $19.1 trillion, with an average annual growth rate of 6.4%. Two-way investment exceeded US $380 billion, and China's outbound direct investment exceeded US $240 billion. The Belt and Road initiative provides an important platform for promoting economic exchanges and win-win cooperation with countries along the Belt and Road, and also provides noble opportunities for investment activities among economies. Through foreign direct investment, Chinese enterprises can better integrate into the "Belt and Road" construction, so as to promote the internal basic system construction and market expansion. These typical cases vividly demonstrate the important contributions made by Chinese enterprises in promoting the process of high-level "Belt and Road", and provide strong support for the leapfrog development of international economic and trade cooperation.

Foreign direct investment is necessary to improve the quality of economic development, and is also an important means to achieve high quality and full employment. As an important participant in economic globalization, China can promote industrial upgrading, technological innovation and optimize production mode, so as to promote higher-quality economic development. Through foreign direct investment, Chinese enterprises can obtain a broader market and resources, and improve their competitiveness and innovation ability. This will not only help enterprises to achieve sustainable development, but also affect the adjustment and optimization of domestic industrial structure. In addition, China's outward direct investment will also help to create more job opportunities, promote the active labor market, and improve the quality of employment and labor income. At present, most of the academic circles study the impact of foreign direct investment on the employment scale at the enterprise level or the destination country, and there are few studies on the changes of domestic labor market income. From the perspective of labor income, this paper studies and analyzes the influence effect of foreign direct investment, and puts forward policy suggestions for reference.

2. Literature review and research hypotheses

Scholars have studied more on employment structure and employment scale, but less on the influence of FODI on labor income. Jasay was the first time to explore the alternative role of OFDI on domestic employment from a theoretical perspective. He noted that the increase in outward direct investment could lead to net capital outflows, especially when domestic capital is limited and there is a dynamic balance. Without a corresponding increase in exports or a decrease in imports, OFDI may have a substitution effect on domestic investment and consumption and a negative impact on employment [1]. Feenstra & Hanson believes that the international flow of capital and other economic activities may have an impact on the domestic capital structure and further affect the labor income [2]. Head & Ries and Cuyvers & Soeng respectively studied the outward direct investment activities of enterprises from Japan and Belgium from the perspective of enterprises, and found that the outward direct investment would increase the overall salary income of enterprises in investing countries by [3,4]. Li Yujuan et al. selected the panel data of 63 countries along the "Belt and Road" from 2009 to 2019 to study the poverty reduction effect of China's outward direct investment on host countries, and found that China's outward direct investment has achieved significant [5] effect in reducing the poverty rate in host countries. Zeng Xiaoqian et al. constructed the SVAR model to analyze the

relationship between OFDI, economic growth and GNP, and concluded that OFDI has a positive effect on economic growth and employment [6]. Jia Nisha et al. studied the problem of whether OFDI is "creating" or "transferring" the mother country effect, investigated the employment effect of OFDI from the two aspects of absolute and relative amount of employment, and drew the conclusion of the degree of influence from the two dimensions of commodity category and investment destination country [7]. Wang Zhikai and others found that outward direct investment was less affected by the target country in promoting employment growth, while [8] was significantly influenced by the type of ownership and investment motivation of investment enterprises. In addition, Pang Xiaoran established a multiple regression model, analyzed the impact of foreign direct investment on China's employment from the perspective of foreign capital inflow and outflow, and drew the conclusion that foreign capital inflow and China's foreign direct investment have a significant effect on promoting employment [9]. From the perspective of employment quality, Cheng Bohui et al. measured the employment quality at the provincial level through the entropy weight method, and concluded that OFDI can significantly improve the employment quality [10].

These documents either study the impact of OFDI level from the perspective of employment scale and employment in the home country, or study the impact of OFDI level on the labor income of employees in enterprises, while there are few studies on the impact of OFDI on regional labor income. In addition, as an important development platform, "Belt and Road" has achieved remarkable achievements in the past decade to all, and scholars need to pay more attention to the impact and development achievements. Therefore, this paper is expanded based on the following aspects: First, this paper pays more attention to the impact of labor income on OFDI, and selects the data of "Belt and Road" provinces from 2005-2022 to study and analyze the impact of ofDI on labor income. Second, this paper focuses on the heterogeneity among regions and analyzes the regional differences in the impact of ODI on labor income.

Based on the above analysis, this paper proposes two hypotheses:

Hypothesis 1: Increasing outward direct investment will increase the national labor income.

Hypothesis 2: The increase in OFDI will bring more benefits to the less developed areas, resulting in a higher income effect.

3. Study design and data sources

3.1 Data description and source

In this paper, 17 provinces along the “Belt and Road” from 2005 to 2022 were selected as research samples. In order to ensure the rigorous and accurate analysis, the sample Xizang with serious vacancy data was excluded, and the balance panel data of 17 provinces from 2005 to 2022 were selected as samples. The level data of OFDI are from China OFDI Bulletin, and the labor income data and other data are from China Statistical Yearbook.

3.2 Model construction

In this paper, we use the bidirectional fixed effect model to estimate the data of foreign direct investment (OFDI) from 17 provinces along the "Belt and Road" line in Xizang from 2005 to 2022 to explore the relationship between OFDI and China's national labor income. Model construction is performed as follows:

$$\boldsymbol{LnLIS_{it} = C + \alpha_1 LnOFDI_{it} + \sum_{m=1}^{n} \alpha_m X_{mit} + \mu_t + \lambda_i + \varepsilon_{it}} \quad (1)$$

Among them, i means the provinces along the “Belt and Road”, and t indicates the year. The explained variable $LnLIS_{it}$ represents labor income; the explanatory variable $LnOFDI_{it}$ represents the level of OFDI in the provinces along the Belt and Road.n Is the number of control variables, and X_{mit} represents the control variable.μ_t and λ_i represent fixed effects and time fixed effects in the provinces along Belt and Road, respectively.ε_{it} Is a random disturbance term.

3.3 Description of the variables

3.3.1 Explained variable

Labor income is $LnLIS_{it}$. Referring to the practice of Jiao Yinxue and Bai Peiwen, this paper selects the proportion of labor income in GDP of provinces along the Belt and Road route at the end of 2005-2022 to measure the share level of labor income, and takes logarithmic [11].

Table 1. Descriptive statistical results for each variable

Variable name	variable symbol	Samples of the provinces along the "Belt and Road"				
		Sample number	Mean value	Standard deviation	Minimum value	Maximal value
Labor income	LnLIS	306	-5.915	0.906	-7.783	-3.811
OFDI level	LnOFDI	306	-8.326	1.844	-13.935	-4.167
Regional economic development level	LnPerGDP	306	10.521	0.655	8.9	12.1
Degree of openness	LnOPEN	306	-5.666	1.794	-10.704	-1.653
Regional wage level	LnWAGE	306	10.779	0.584	9.576	12.267
Regional education level	LnEDU	306	2.185	0.115	1.853	2.513

3.3.2 Interpret variable

OFDI level is $LnOFDI_{it}$. Considering the importance of foreign direct investment (OFDI) in China's countries along the Belt and Road route, this paper chooses the data of the end of the year as the proportion of GDP as the indicator of the OFDI, and logarithmically processes these data. The specific data are from China Statistical Bulletin of OFDI and China Statistical Yearbook.

3.3.3 Control variables

Regional economic development level. According to Ma Guangming's practice, using the regional per capita GDP to measure the degree of economic development, and do logarithmic processing [12].

Degree of openness to the outside world. This paper measures the proportion of the import and export trade volume of the provinces along the "Belt and Road" line from 2005 to 2022, and makes a logarithmic treatment.

Regional wage level. This paper adopts the average wage level of urban unit workers, and takes the logarithm.

Regional education level. This paper refers to the practice of Wen Hong and Xin Qiang, and adopts the proportion of each degree from 2005 to 2022. The measurement formula is $EDU = p * 6 + m * 9 + h * 12 + c * 16$, and does logarithmic processing. Among them, p, m, h and c respectively indicate the proportion of personnel with primary school education, the proportion of personnel with junior high school education, the proportion of personnel with high school and secondary vocational education, and the proportion of personnel with junior college education or above[13]. Table 1 shows the descriptive statistical results for each variable.

4. Empirical analysis

4.1 Benchmark regression

Table 2 is the result of the regression of the effect of OFDI level on labor income. It can be seen that the regression coefficient of OFDI is significantly positive at the level of 1%, and the coefficient size is 0.0797, which preliminarily indicates that OFDI has a significant positive impact on the labor income share of the provinces along the "Belt and Road" line. It can be seen that for every 1% increase in outward direct investment, the share of local labor income will increase by about 0.0630%. The above analysis and the regression results prove the validity of hypothesis 1.

Table 2. Impact of OFDI on labor income

Variable name	(1)	(2)	(3)	(4)	(5)
	LIS	LIS	LIS	LIS	LIS
Labor income	0.0797***	0.0661***	0.0656***	0.0634***	0.0630***
	(5.8701)	(4.6468)	(4.6348)	(4.5326)	(4.5313)
OFDI level		0.2308***	0.1509*	0.0121	-0.0394
		(2.8423)	(1.6627)	(0.1187)	(-0.3782)
Regional economic development level			0.0443*	0.0513**	0.0524**
			(1.9298)	(2.2530)	(2.3132)
Degree of openness				0.4875***	0.4969***
				(2.8708)	(2.9426)
Regional wage level					0.4423**
					(2.0519)
Constant	-5.2953***	-7.6275***	-6.6323***	-10.0621***	-10.5743***
	(-37.0297)	(-9.1614)	(-6.7967)	(-6.5574)	(-6.8414)
Individual fixed	YES	YES	YES	YES	YES
Time fixed	YES	YES	YES	YES	YES
sample number	306	306	306	306	306
R-squared	0.607	0.618	0.623	0.635	0.640

Note: * * * P <0. 01, * * P <0. 05, * P <0. 1, are significant at 1%, 5%, 10%, respectively; t-values in parentheses, as are in Table 3 and Table 4.

4.2 Robustness test

The robustness analysis is used to ensure the reliability of the regression analysis. This paper selects three robustness test methods: the first one is to solve the problem of model endogeneity. Regression analysis was performed using lag-phase explanatory variables and the results are shown in Table 3 column (1), showing significant positive at the 1% level with a regression coefficient of 0.0586. The second, increase the control variable. Considering that labor income may also be affected by factors such as industrial base and regional level of research and development. Therefore, this paper adopts the method of increasing the control variables to test the robustness. The industrial base is measured by the proportion of the output value of the secondary industry in the provinces along the Belt and Road, and the research and development level is measured by the proportion of R & D funds in the researchers of the provinces along the Belt and Road, and taken logarithmically. The relevant data comes from the China Statistical Yearbook. The regression results are shown in Table 3 column (2), and it can be seen that the regression result is significantly positive at the 1% level, with a regression coefficient of 0.0598. It shows that the OFDI still has a positive and significant effect on labor income after increasing the control sample. The third, modify the sample range. In this paper, the sample was shortened to 2010-2022. The results are shown in Table 3 column (3). The regression results were also significantly positive at the 1% level, with a regression coefficient of 0.0678.

Table 3. Robustness test of the promotion effect of OFDI on labor income

Variable name	Endogenous problem	Increase control variables	Change the sample range (2010-2022)
	(1)	(2)	(3)
	LIS	LIS	LIS
First-order difference of OFDI	0.0586***		
	(4.2197)		
OFDI level		0.0598***	0.0678***
		(4.3283)	(4.4555)
Scientific research and technical level		-0.0623*	
		(-1.8921)	

Industrial base		0.0457*	
		(1.8768)	
Constant	-12.6515***	-10.4741***	-20.9561***
	(-7.7196)	(-6.6064)	(-11.1406)
Individual fixed	YES	YES	YES
Time fixed	YES	YES	YES
sample number	289	306	221
R-squared	0.647	0.650	0.641

Through observation, the results of these three robustness tests were significantly positive at the 1% level, which was basically consistent with the previous findings, ensuring the robustness of the model and the credibility of the regression results.

4.3 Heterogeneity test

Considering the difference of OFDI on labor income caused by the difference of economic development level among different regions in China, this paper examines the heterogeneity of income level in the provinces along the "Belt and Road". Referring to the definition of the World Bank, this paper divides the provinces with per capita GDP higher than the national per capita GDP into developed regions, and the provinces with lower than the national per capita GDP as underdeveloped cities. The regression results are shown in Table 4. It can be seen that the increase of OFDI has a positive effect on the labor income in both the developed and less developed areas, and the positive impact on the less developed areas is greater, which is significantly positive at the level of 1%. Overall, the increase of OFDI is more favorable to the increase of labor income in the less developed areas. In less developed areas, increased investment usually leads to more employment opportunities and economic activity, thus increasing the labor income level of local residents. Such investment may promote infrastructure construction, technology transfer and industrial development, improve local production conditions and employment environment, and thus increase the income level of workers. In contrast, in developed regions, the labor market may be more saturated and wages are relatively high, so the impact of increased OFDI on labor income may be relatively small. Although increased investment may promote business development and innovation, the potential of labor income growth may be somewhat limited in developed areas. The above analysis and the regression results prove the validity of hypothesis 2.

Table 4. Regional difference test of the promotion effect of OFDI on labor income

Variable name	Less developed areas	Developed area
	(1)	(2)
	LIS	LIS
Labor income	0.0397***	0.0446
	(3.8761)	(0.9502)
OFDI level	0.8367***	-0.4751**
	(7.9308)	(-2.0175)
Regional economic development level	0.0169	0.0909
	(1.0878)	(0.5183)
Degree of openness	0.5515***	1.1772***
	(3.7241)	(3.1765)
Regional wage level	0.2001	0.3520
	(0.8872)	(0.8888)
Constant	-19.4217***	-12.3593***
	(-12.6944)	(-3.3466)
Individual fixed	YES	YES
Time fixed	YES	YES
sample number	198	108
R-squared	0.834	0.613

5. Summary

This paper selects the balance panel data of 17 provinces along the "Belt and Road" from 2005 to 2022 to test the impact of OFDI on China's labor income. The research results show that: (1) the increase of outward direct investment has a significant positive impact on the growth of labor income in the provinces along the "Belt and Road" line. Specifically, every 1% increase in OFDI will increase the share of labor income by about 0.063%. (2) From the perspective of regional heterogeneity, the promoting effect of OFDI on labor income is more significant in the economically underdeveloped areas. This is because the labor market in the economically developed areas is relatively saturated, the income level is relatively high, and the infrastructure is relatively perfect, so the increase of outward direct investment has a relatively little impact on their labor income. In economically underdeveloped areas, facilities, industrial development and labor market all have great room for development, and the increase of outward direct investment will more directly bring economic vitality to these regions, thus promoting the significant growth of labor income. Overall, the results of this paper show that OFDI not only plays an important role in promoting the economic development and employment of the provinces along the "Belt and Road", but also helps to improve the income level of workers and promote the high-quality economic development. This has provided useful experience and inspiration for further realizing high-level opening-up and helping China's modernization drive.

According to the above conclusions drawn in this paper, the following targeted suggestions are put forward: (1) to promote the construction of an open world economy, we must actively build a three-dimensional connectivity network. To promote Belt and Road development, we will take connectivity as the main task. By building all-round connectivity, we will take the lead in infrastructure, promote economic development and improve people's livelihood, and promote the Belt and Road Initiative with innovation as the driving force. Innovation is an important force for development. We need to build the Belt and Road Initiative into a road of innovation and actively integrate it into the global scientific and technological innovation network. We need to cooperate with countries jointly building the Belt and Road Initiative in the digital economy, such as mobile payment and cross-border e-commerce, and seize the opportunities brought about by the new round of scientific and technological revolution and industrialization.(2) We will continue to expand foreign direct investment and achieve opening-up at a high level. In 2000, the CPC Central Committee put forward the strategy of "going out", which ushered in the initial wave of China's foreign direct investment. Over the past 20 years, China's total outward direct investment has grown rapidly. With the development of economic integration and economic globalization, the division of labor in the global value chain is becoming increasingly complex, and the multi-integrated business model has become a new trend. China's OFDI needs to meet the development trend of economic globalization, build a multi-scope operation system, move towards the middle and high end of the value chain division, and realize the transformation from "investment power" to "investment power". At the same time, we will promote the development of Belt and Road and build economic and trade platforms with other countries through investment and trade for mutual benefit and win-win results. China's outward direct investment is mainly driven by common development and is achieved through various paths and models. The construction of "Belt and Road" provides a platform for domestic enterprises to enter the international market and promote the development of local industrial clusters.(3) Enterprises should strengthen their innovation capacity and enhance their global competitiveness. Innovation is the key to enhance the international competitiveness of enterprises. The independent innovation ability of enterprises is the key factor for enterprises to enhance their comprehensive strength and expand their market position. For overseas direct investment, enterprises need to have high-level and international talents and capacity reserves, while Chinese enterprises should pay attention to the layout of the global industrial chain and localized operation when investing overseas. Investment in countries with relatively mature economic development along the Belt and Road route will further test the innovation ability of Chinese enterprises. As multinational enterprises, Chinese enterprises have unique advantages in attracting global talents. Therefore, in the process of "going global", they should make full use of this advantage, pay attention to talent training, and provide solid support for the vigorous development of enterprises.

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