



# Labour Income Share Effect of Reform and Opening Up Based on OFDI, Labour Quality Perspective

Zhuang Qian<sup>(✉)</sup>

School of Economics, Wuhan University of Technology, Wuhan, China  
2470361028@qq.com

**Abstract.** Improving the distribution system is an important objective of China's economic development at this stage. Capturing the mechanism of the impact of reform and opening up on the labour income share from the perspective of micro enterprises is of great significance for China to achieve structural optimisation of factor income distribution. This paper empirically investigates the impact of foreign direct investment and reform of state-owned enterprises on the share of labour income from 2011 to 2021, using a sample of A-share listed companies in China and incorporating labour heterogeneity into the analysis framework, and examining the impact of foreign direct investment and reform of state-owned enterprises on the share of labour income from two paths: "average wage" and "labour productivity". The impact of OFDI and SOE reforms on labour income shares is investigated empirically along the paths of "average wage" and "labour productivity". The study finds that both OFDI and SOE reforms significantly increase the labour income share, and that labour quality has a significant moderating effect by optimising their paths of action.

**Keyword:** Labour income share · reform and opening up · labour quality · PSM-DID

## 1 Introduction

The 20th Party Congress Report pointed out that improving the distribution system is the first priority in enhancing people's well-being and is a fundamental system for promoting common prosperity. Since the vast majority of the lower and middle income groups derive their disposable income from the exchange of labour, while the higher income groups mostly derive their income from capital gains, a lower share of labour income tends to lead to a larger gap between the rich and the poor. However, since the 1990s, China's labour income share has fallen from 59% to 47% in 2006 [1] and has since rebounded but remains below 50%, below the level of developed countries, which in the long run is very detrimental to quality economic development. In this regard, the report of the 20th National Congress proposes: insisting on deepening the reform of the distribution system, encouraging more work and more pay, and promoting the achievement of common prosperity by raising the share of labour income. At the same time, under the leadership of

© The Author(s) 2023

R. B. B. M. Hussain et al. (Eds.): ICHSSR 2023, ASSEHR 765, pp. 924–932, 2023.

[https://doi.org/10.2991/978-2-38476-092-3\\_113](https://doi.org/10.2991/978-2-38476-092-3_113)

the reform and opening-up strategy, the international development of Chinese enterprises has achieved remarkable results. According to China's National Bureau of Statistics, China's outward foreign direct investment flows reached US\$1,788.2 trillion in 2021, an increase of 140% compared to a decade ago. The transfer of production factors brought about by the rapid growth of OFDI has also played a significant role in increasing the share of labour income and optimising the factor income structure in China.

With the development of information technology, the accuracy and availability of statistical data has been improved, and a large number of studies on labour income shares from a micro perspective, with enterprises as the object of study, have emerged in recent years. The academic community has focused on the factor flows that occur in the course of firms' international operations, which bring about changes in factor prices and thus have an impact on the share of labour income. This part of the research is mostly conducted from a trade perspective, and it is found that international trade promotes the increase of labour income share through mechanisms such as biased technological progress and labour bargaining power [2, 3], and its promotion effect is still significant in a global value chain perspective [4]. In contrast, there are relatively few studies on the labor income share effect launched from the perspective of outward investment. Most of them still remain at the level of employment effect or wage effect of investment on the parent company [5, 6]; among the limited studies, although there are some controversies among scholars on the direction of the effect of outward investment on labour income share [7, 8], most of the studies recognize the technology spillovers and the impact on labour factor prices play a more dominant role [9, 10]. It has also been found that the wage share of highly skilled workers in the home country receives a more significant boost in firms' OFDI [11].

Throughout the relevant studies, the impact of the reallocation behaviour of capital and labour on the labour income share has been extensively researched, and the effect of OFDI as an important factor reallocation activity has been confirmed by studies, but the studies on the effect of OFDI are still mainly focused on the macro level, and the grasp of its micro mechanism is not clear enough; in addition, the existing studies on the labour income share in the market for labour factors. In addition, the existing studies on labour income shares have not yet made sufficient assumptions about the labour factor market, often reducing the labour factor to the number of people in the labour force, thus ignoring the heterogeneity of labour. Whereas the most appropriate technology for a country is determined by the quantity and quality of its labour force [12], a highly qualified labour force is also an important driving force for autonomous innovation capabilities and a key to promoting high-quality economic development in China [13]. Moreover, for different types and levels of labour force, they also present different impacts in the face of technological shocks [14, 15]. Therefore, it is very necessary to include labour force heterogeneity in the framework of labour income share analysis.

## 2 Theoretical Mechanisms

### 2.1 Decomposition Effect

To nuance the analysis of the labour income share, we first decompose it into two parallel effects as the equal (1):

$$laborshare = \frac{wL}{Y} = \frac{w}{\frac{Y}{L}} \quad (1)$$

where laborshare is the share of labour income,  $w$  is the wage per employee,  $L$  is the number of employees,  $Y$  is the value added of production, and  $Y/L$  is the labour productivity of the firm. This is then logarised to give equal (2).

$$\ln(ls) = \ln(w) - \ln(Y/L) \quad (2)$$

Thus, after decomposition, the effect of the wage share of employees in the home country can be understood as the combined effect of its effect on the per capita wage of enterprises and its effect on the labour productivity of enterprises. According to existing studies, there is a boosting effect of reform and opening up on both average wages and labour productivity, however, the effects of the above two paths on labour income share can cancel each other out to some extent, making the effect of labour income share effect of reform and opening up less clear.

#### Wage Effect

The process of OFDI is often accompanied by the opening up of entirely new markets, and more competitive markets often also create incentives for firms to improve their operating efficiency as well as promote industrial upgrading. As industries upgrade, labour will move from lower-level industries with lower labour productivity to higher-level industries with higher labour productivity. The transfer of labour brings about rapid growth in aggregate output, but because of the excess supply of labour in lower-level industries, the wage rate remains relatively stable and thus the share of labour income declines. However, after a certain threshold is crossed, the shortage of labour supply in low-level industries and the diminishing marginal returns to labour input in high-level industries lead to a rapid increase in the wage rate relative to total output, so that the industrial structure and technological upgrading of the parent company triggered by OFDI may show an overall U-shaped trend in the share of labour income [16]. Nowadays, China has gradually emerged from the stage of excess supply of low-grade labour, so it is reasonable to speculate that OFDI in China at this stage has had a catalytic effect on the labour income share by raising the average wage.

#### Labour Productivity Effects

In market development-oriented OFDI, enterprises facing overseas markets different from their domestic ones often have to increase their R&D investment for new product development or product localisation in order to gain market share, thus upgrading the technology level of their overseas subsidiaries. In the production practices and technological exchanges of enterprises, technological advances in overseas subsidiaries are

often transmitted to the domestic level, in line with the improved resource allocation and absorptive capacity acquired by domestic enterprises in the context of reform and opening up, thus obtaining significant technological spillover effects, which in turn boost the labour productivity of the domestic parent company. When labour productivity increases, it means, on the one hand, an increase in productivity per unit of labour and, on the other hand, a reduction in the labour required for the same scale of production, and most of the reverse technological spillovers tend to come from developed countries where capital factors are intensive and labour factors are scarce, so the technological improvements obtained tend to be capital-biased (labour-saving) biased technological advances. As a result, labour productivity gains, while increasing the productivity of individual employees, tend to reduce the overall labour income share [17].

Accordingly, the following hypothesis are established:

Hypothesis 1: OFDI can raise average wages and labour productivity.

Hypothesis 2: OFDI acts on the labour income share through the paths of raising average wages and labour productivity, and the direction of its effect on the labour income share depends on the magnitude of the effect of the two opposite paths.

## 2.2 Moderating Effects of Labour Quality

In studying labour income shares, the assumptions about labour force factors that form the basis of the model, the heterogeneity of knowledge, health and quality possessed by different workers should not be ignored in order to construct a model with more realism and explanatory power.

The quality of the labour force largely influences the size of these two effects: a high level of labour tends to demand higher wages, has higher bargaining power, is more likely to choose and is more able to jump ship when wages are lower than expected, and is therefore more sensitive to pay and thus receives greater pay concessions. Moreover, firms with a higher average quality of labour will also suffer less outflow from the lower end of the industry. Thus, a high level of labour can amplify the effectiveness of OFDI in raising average wages as well as labour income shares, with a positive moderating effect.

On the other hand, compared to lower-level labour, higher-level labour tends to be able to adapt more quickly to new technologies and new modes of production due to its stronger learning ability, and to reap greater benefits from new technologies and new capital inputs, generating greater labour productivity gains [18]. In addition, high-level labour, such as highly educated R&D workers, and skilled workers with extensive experience, perform jobs that are highly non-substitutable and generally do not lose value as a result of technological advances or new equipment being put into use, so high-level labour tends to be less affected by the deterioration in factor distribution patterns resulting from labour productivity gains. That is, labour quality will not only have a positive moderating effect on labour productivity, but will also attenuate the negative effect of labour productivity gains on the share of labour income.

Accordingly, hypothesis 3 is created:

High labour quality positively moderates the substitution effect of higher labour productivity and the spillover effect of higher average wages.

**Table 1.** Basic tests

VARIABLES	(1) lshare	(2) avsalary	(3) lproduct	(4) lshare
avsalary				0.251*** (179.53)
lproduct				-0.251*** (-238.20)
OFDI*TIME	0.011*** (4.42)	0.030*** (3.70)	0.066*** (6.01)	-0.001 (-1.25)
Constant	0.820*** (38.03)	10.113*** (141.58)	8.033*** (89.09)	0.793*** (54.59)
Observations	23,750	24,049	24,037	23,748

### 3 Empirical Analysis

#### 3.1 Data Sources

The financial data of enterprises used in this paper are mainly from the database of listed companies in the Guotaian database. Information related to the OFDI behaviour of enterprises is obtained from the Statistical Database of Chinese OFDI Enterprises, which contains information on whether the enterprises made OFDI in a particular year, the host country and the timing of the investment. The selected sample range is non-financial non-st stocks from 2011 to 2021, and the two databases mentioned above are combined according to company names in order to construct a usable sample set for regression analysis considering two-way fixed effects as well as control variables after eliminating self-selection effects through propensity score matching.

#### 3.2 Basic Tests

Based on the sample data after propensity score matching, a mediating effects regression considering the path of action was conducted and the results are shown in the Table 1.

In the overall regression in column (4), the regression coefficients of average wage (avsalary) and labour productivity (lproduct) are both significant and one positive and one negative, indicating that OFDI does act on labour income share through two opposite paths of average wage and labour productivity, and from the base test in column (1) of Table 1, we can see that overall the regression of OFDI on labour income share still shows a The regressions of OFDI on average wages and labour productivity in columns (2) and (3) are also significantly positive, which confirms the theoretical derivation of hypothesis 1.

#### 3.3 Robustness Tests

As there is often some bias in the statistics on employee wages and in the measurement of labour income shares, in order to avoid the results being at odds with the actual

**Table 2.** Robustness tests

VARIABLES	(1) Lshare	(2) Nuclear	(3) L1.Lshare_	(4) L2.Lshare
OFDI*TIME	0.011*** (4.42)	0.011*** (4.67)	0.014*** (4.81)	0.015*** (4.65)
Constant	0.947*** (18.67)	1.020*** (37.65)	0.960*** (19.12)	0.950*** (19.74)
Observations	23,750	23,439	16,359	14,210

effect due to bias. In this paper, we replace the matching method with quadratic kernel matching and run the regression again. The final measurement results are shown in column (2) of the Table 2, while column (1) shows the original regression results as a comparison. In addition, since OFDI tends to take some time to contribute to the labour income share through channels such as average wages and labour productivity, this paper regresses the labour income share after a 1-year and 2-year lag in turn, and the results are shown in columns (3) (4). It can be seen that after changing the matching method and the lag treatment, the regression coefficient of OFDI is still positive and The results are consistent with the original regression and validate the robustness of the promotion effect.

### 3.4 Further Research: Testing for Moderating Effects

To bring the model closer to reality, a cross product term  $i\_1$  between labour quality and investment is added to the model to measure the moderating effect of labour quality on the factor allocation pattern.

As shown in Table 3, the positive moderating effect of labour quality can be clearly seen when the labour quality cross multiplier  $i\_1$  is added to the regressions of OFDI on average wages and labour productivity in columns (2) and (3), reflecting the optimising effect of labour quality on production efficiency. In addition, the coefficient of

**Table 3.** Testing for moderating effects

VARIABLES	(1) lshare	(2) avsalary	(3) lproduct	(4) skillprem
$i\_1$	0.006*** (3.46)	0.140*** (24.64)	0.152*** (18.71)	-0.093* (1.80)
OFDI*TIME	0.012*** (4.67)	0.029*** (3.64)	0.060*** (5.50)	0.210*** (2.96)
Constant	0.814*** (37.24)	10.156*** (145.24)	8.195*** (90.94)	-5.524*** (-9.14)
Observations	23,219	23,504	23,492	23,499

the cross product term in column (1) is also positive, showing that the labour quality cross product term also positively moderates the labour income share effect of OFDI in general. Accordingly, it can be concluded that labour quality not only promotes the factor allocation effect of OFDI, but also optimises the path of the effect of OFDI on labour income share, verifying hypothesis 3.

Regarding the intra-labour distributional effects of OFDI, a regression of the skill premium (column 4) reveals that the increase in the share of labour income from OFDI comes at the cost of a certain degree of increase in the skill premium, meaning that while labour factor income gains, the income gap between different labourers within the labour force widens. At the same time we note that labour quality also reduces the skill premium to some extent.

Overall, the quality of the workforce optimises the distribution of factors, reduces inequality within the workforce and contributes to the equity and efficiency of business development.

## 4 Conclusions and Insights

At a critical moment when the global economy is facing downside risks, promoting a high level of outward opening, improving the quality and level of trade and investment cooperation, and alleviating the contradictions in factor distribution are important supports for promoting China's economic transformation and achieving high-quality economic development. Based on a dataset of listed enterprises from 2011–2021, this paper examines the impact of OFDI on labour income shares from multiple perspectives using the propensity score matching-dual difference method, and draws the following key conclusions:

First, OFDI raises the share of labour income by raising average wages and labour productivity, but this comes at the cost of a parallel increase in the skill premium.

Secondly, the quality of the labour force not only facilitated the reform and opening up to increase the average wage and labour productivity, but also reduced the negative impact of labour productivity on the labour income share and increased the positive impact of the average wage on the labour income share, thus acting as a positive moderator of rent.

Based on the above findings, this paper makes the following policy recommendations:

First, encourage enterprises to actively go global. The government should, through fiscal and taxation policies, guide enterprises to make use of the resources and factors of the global market, actively invest abroad, improve the remuneration of labour factors, and enhance the fairness of the initial distribution.

Second, establish a mechanism to protect the income and rights of workers. Deepen reform and opening up, on the one hand, increase R&D investment, increase R&D talent and enhance the ability to absorb reverse technological spillover effects; on the other hand, enhance the efficiency of resource allocation through market-oriented reforms and reform of the ownership system of state-owned enterprises to guarantee the income stability of workers at different levels.

Thirdly, to establish and improve the talent cultivation mechanism. The government should continue to increase investment in education and optimize the talent training mechanism in order to drive up the quality of the workforce. In addition, it is necessary

to ensure the development of higher education on the one hand, and build a technical education and skills training system on the other, with a view to achieving the goal of common prosperity for the workforce.

## References

1. Bai Chong-en, Qian Zhenjie. Factor distribution of National income: The Story behind Statistics [J]. *Economic Research Journal*, 2009,44(03):27-41.
2. Fu Xiaoxia, Wu Lixue. Partial efficiency improvement and change of China's factor return share [J]. *The Journal of World Economy*, 2013,36(10):79-102.
3. Xie Shenxiang, Lu Yi, CAI Xiqian. Wage bargaining power of workers in an open economy [J]. *Social Sciences in China*, 2019,(05):40-59+205-206.
4. Sui Guangjun, Sun Zhaoji, Chen Wen. Global value chain embedment and labor income share: Theoretical and empirical analysis based on China [J]. *Journal of International Trade*, 2021,(02):96-112.
5. Wang Zhikai, Lu Yangyang. Study on Chinese enterprises' foreign direct Investment and Domestic employment Growth [J]. *Journal of Shanghai Jiaotong University (Philosophy and Social Sciences)*, 2020,28(04):34-46.
6. Yan Hongrong, Xian Guoming. Whether foreign direct investment can increase employee income -- Evidence from Chinese listed companies [J]. *Journal of International Trade*, 2017,(11):93-103.
7. Mao Qiling, Xu Jiayun. How does Chinese Foreign direct investment affect employee income? [J]. *Industrial Economics Research*, 2014,(06):50-59.
8. Jia Nisha, Lei Hongzhen. Foreign direct investment and labor income share: Empirical evidence from Chinese micro enterprises [J]. *International Economics and Trade Research*, 2017,33(09):86-98.
9. Wang Xiongyuan, Huang Yujing. Foreign Direct Investment and Labor Income Share of Listed Companies: Take advantage of the crisis or add to it [J]. *China Industrial Economics*, 2017(04):135-154.
10. Wan Jing, Zhou Jishun. Does foreign direct investment promote the growth of China's labor income share? A threshold effect study based on the "One Belt, One Road" data [J]. *International Business*, 2022,(02):87-104.
11. Yuan Ziqing, Yang Yaping. "The Journey of Chiseling" will help people: How does the "Belt and Road" foreign direct Investment Increase the share of labor income [J]. *South China Journal of Economics*, 2018,(08):60-83.
12. Caselli, Francesco, and Wilbur John Coleman II. 2006. "The World Technology Frontier." *American Economic Review*, 96 (3): 499-522.
13. Ma Ru, Zhang Jing, Wang Hongwei. Does science and technology talent promote high-quality development of Chinese economy? -- Empirical test of the effect of scientific and technological talents on total factor productivity growth [J]. *Research on Economics and Management*, 2019,40(05):3-12.
14. Ming Juan, Hu Jiaqi. Application of industrial robots, labor protection and employment of heterogeneous skilled labor [J]. *Population & Economics*, 2022,(04):106-121.
15. Sun Xue, Song Yu, Zhao Peiya. The impact of artificial Intelligence on the employment of heterogeneous labor -- Based on the perspective of labor supply [J]. *Inquiry into Economic Issues*, 2022,(02):171-190.
16. Li Daokui, Liu Linlin, Wang Hongling. U-shaped law of labor share evolution in GDP [J]. *Economic Research Journal*, 2009,44(01):70-82.



17. Kehrig, Matthias, and Nicolas Vincent. "The micro-level anatomy of the labor share decline." *The Quarterly Journal of Economics* 136.2 (2021): 1031-1087.
18. Liu Yiming, Wang Yiming. Labor quality and Labor Productivity in Private Enterprises: A Marxist Perspective [J]. *The Journal of World Economy*, 2021,44(01):3-24.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

