

## **Comparative Study of the Interprovincial Value Chain Embedding Degree of Decent Work in China's Trade - Based on the Perspective of Labor Clauses in Regional Trade Agreements**

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### **Abstract**

In the context of China's accession to labor clauses in regional trade agreements in the process of globalization, a comparative study of the interprovincial value chain embedding degree of decent work is beneficial for accurately measuring the development differences of regional trade in China. It also provides empirical support for the future development direction of labor clauses in regional trade agreements based on the development differences in different regions. Based on composite weighting calculation and analysis of the degree of decent work of urban labor force in different regions of China from 2014 to 2021, and using decomposition model to calculate the global value chain embedding degree, this study analyzes the interprovincial differences of decent work on the value chain embedding degree through fixed effects model. Furthermore, it examines the specific mechanism of influence by labor cost as an intermediary. The study finds that: (1) Improving the degree of decent work helps to enhance the global value chain embedding degree of various provinces in China. (2) The degree of decent work significantly promotes the improvement of the global value chain embedding degree in the eastern and central regions, with a higher impact on the central region than the eastern region, while the impact on the western region and the northeastern region is not significant. Moreover, the promotion effect of decent work on the secondary industry is more significant than that on the tertiary industry. (3) Although the degree of decent work increases labor costs, it is conducive to increasing trade volume and promoting the improvement of the global value chain embedding degree under the background of enterprises joining the SA8000 corporate social responsibility. Based on this, this paper proposes measures such as improving labor laws and regulations, improving the protection system of labor rights and interests, and improving the degree of decent work for workers; leveraging regional advantages to achieve overall improvement in the division of labor status of different regions in China's trade value chain; strengthening support for high-tech manufacturing and innovation in business development models, etc., to improve the interprovincial value chain embedding degree of China's different regions. Furthermore, through strengthening the research and coordination of labor standards clauses in regional trade agreements, actively promoting the inclusion of labor clauses in regional trade agreements, formulating differentiated standards for phased coordination of labor clauses, and advocating the establishment of friendly cooperative dispute resolution mechanisms or adopting the model of signing subsidiary labor agreements to solve labor problems, etc., exploring the development path of China's accession to labor clauses in regional trade

agreements.

**Keywords:** Decent work; Value chain embedding degree; Labor clauses in regional trade agreements

## 1.0 Introduction

In the field of international economics research, core labor standards have always been an intricate and unavoidable topic that often sparks controversy, but unavoidable topic. This concept was proposed by the International Labour Organization and involves aspects such as safeguarding workers' rights and improving working conditions. Specifically, it includes freedom of association and collective bargaining rights, the elimination of all forms of forced labor, the abolition and prohibition of child labor, as well as the eradication of employment and occupational discrimination. In contemporary academic discourse, 'decent work' entails enabling the majority of workers to operate in conditions that are free, fair, safe, and dignified. This is achieved through initiatives promoting employment, enhancing social security, protecting workers' fundamental rights, and fostering tripartite dialogue involving governments, business entities, and labor unions. This concept aligns closely with core labor standards.

It is the general trend to introduce labor standards into regional trade agreements and actively promote the inclusion of core labor standards such as prohibition of forced labor and freedom of association in the labor clauses of regional trade agreements. As of May 2024, China has signed 22 free trade agreements with 29 countries and regions, covering Asia, Oceania, Latin America, Europe, and Africa. The bilateral free trade agreements with Chile, New Zealand, Peru, Switzerland, and Iceland also include content on labor, social security, and employment cooperation. In addition, China completed negotiations on the Comprehensive Agreement on Investment between China and the European Union in 2020, and announced its application to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in 2021. In 2023, China submitted the documents for joining the CPTPP to its members, marking China's efforts to strengthen its own labor standards and actively promote the coordination of labor clauses in regional trade agreements. Whether it is the China-EU Comprehensive Agreement on Investment, CPTPP, or the previously signed free trade agreements containing labor clauses, they all involve how to deal with the relationship between labor standards and strengthening trade exchanges. So, what kind of impact will labor standards and decent work have on China's participation in the global value chain? How to determine the specific content of China's labor standards and align them with regional trade agreements in trade negotiations? These are theoretical and practical issues worth studying in achieving high-level opening up to the outside world.

## 2.0 Results

### 2.1 Main Results

(1) There is a significant positive correlation between the level of decent work and the degree of global value chain integration. China needs to further improve labor laws and regulations, enhance labor relations negotiation and coordination mechanisms, and strengthen the protection of workers' rights and interests. The following aspects warrant attention: Firstly, with regard to core labor standards, it is imperative to further improve and optimize labor laws and labor contract laws, broaden the scope of labor law governance, and enhance the labor legal system. For example, guaranteeing workers' rights to organize and collective bargaining through laws and institutions; explicitly prohibiting forced labor in labor laws to protect the dignity of workers; incorporating principles of equal employment and non-discrimination into labor laws to improve legislation against employment discrimination; strengthening the protection of child labor and minors, etc. Secondly, establish a more comprehensive and extensive social security system, weave a tight network of livelihood security projects, and make the protection of workers' rights a top priority of the government's work, so that workers can feel more dignity and decency in their work. Thirdly, by improving the management and operation of trade unions, granting trade unions relative freedom and economic status, transforming trade unions from a component of the state power to an organization representing and safeguarding the legitimate rights and interests of workers, clarifying the role of trade unions in representing and safeguarding workers' rights, and realizing the reform of the trade union system. Fourthly, strengthen labor law enforcement, recognize the importance of labor standards, and establish a cooperative mechanism for the implementation of labor standards. The government labor authorities, employers, and trade unions should work together, through various forms of social dialogue, collective bargaining, mutual cooperation, to strengthen the protection of workers' legitimate rights and interests, and emphasize mutual supervision between the government and non-governmental organizations to improve the efficiency and quality of law enforcement. By continuously improving and perfecting labor protection laws, gradually aligning China's labor standards with international standards, and promoting better integration of Chinese import and export enterprises into the global value chain.

(2) There are significant differences in the level of decent work and the degree of global value chain integration among different regions in China. Currently, China needs to leverage regional advantages to achieve an overall improvement in the trade value chain division of labor in different regions. On the one hand, based on resource endowments, implement differentiated regional trade development policies. The economic structure and industrial development in western and northeastern regions of China are relatively lagging behind, and the rising labor costs and declining competitiveness of export products have a greater impact on the depth of value chain in these regions. The Belt and Road Initiative can be used to transfer production capacity to economically backward regions and countries along the Belt and Road, thereby improving the depth of trade value chain. The eastern and central regions can rely on the theory of new quality productivity to transform traditional industries through

technological breakthroughs, innovative allocation of production factors, and deep transformation and upgrading of industries, actively promoting industrial high-end, intelligent, and green development, and establishing a high-end position in the global value chain. By further tapping into the mid and low-end sectors and actively promoting high-end sectors, efforts can be made to achieve an upward shift in the trade value chain division of labor in different regions of China. On the other hand, systematically construct a hierarchical and interconnected regional industrial development pattern to continuously improve the level of global value chain integration in each region. The eastern region should fully utilize the advantages of innovative factors aggregation, take the lead in industrial upgrading, and create new advantages in global value chain integration. The central and western regions should actively undertake industrial transfers from the eastern region. The northeastern region should deepen the reform of state-owned enterprises, optimize the business environment, and leverage the advantages of old industrial bases to participate more deeply in the global trade value chain. By constructing a hierarchical and interconnected regional industrial development pattern, China's different regions can better integrate into the global value chain, participate in the global value chain at a deeper level, and improve trade integration.

(3) Promoting decent work can significantly enhance the level of global value chain integration in the secondary and tertiary industries. On the one hand, China needs to continue to increase funding and policy support for scientific research and development, especially in the high-tech industry sector, to improve the independent innovation capabilities of scientific researchers and promote the continuous advancement of China's manufacturing industry to a high level. On the other hand, innovative development models in the service industry should be promoted, creating new market demands through innovation, changing traditional product structures and business models, building new industrial chains, and further utilizing the advantages of different regions in China to enhance their position in the global value chain.

## **2.2 Policy Recommendations**

Linking international trade with labor standards is in line with the interests of the United States and the European Union. Currently, the United States and the European Union have established regional or bilateral free trade areas and incorporated labor standards into them, making free trade agreements an important channel for promoting labor standards. Due to differences in political and economic systems, there are differences between China's labor standards and the basic labor rights and principles advocated by international labor organizations. It is not advantageous for China to fully accept the basic labor rights and principles advocated by international labor organizations in the process of joining regional trade agreements. China should proactively adapt its policies and strategies, strengthen research and coordination with the labor standard clauses of regional trade agreements, and explore a better path to balance trade and social development. The following areas can be focused on:

Firstly, actively change the mindset and promote the inclusion of labor clauses in regional trade agreements. China has already ratified United Nations conventions regarding the

abolition of child labor and the elimination of employment and occupation discrimination, which can be included in the negotiation of labor clauses in regional trade agreements. In addition, in the areas of social security, working conditions, and employment promotion, regional trade agreements are limited to the protection levels determined by each contracting country's domestic labor laws. With the continuous improvement of China's labor laws and regulations, there are no legal obstacles for China to accept acceptable working conditions stipulated in regional trade agreements. China can adopt an "acceptance" strategy.

Secondly, based on the regional economic disparities, formulate a strategy of differentiated standards and phased alignment with labor clauses. Currently, China has not ratified the United Nations conventions on freedom of association and collective bargaining or the abolition of forced labor. It is not feasible to fully incorporate them into labor clauses of regional trade agreements. Adopting labor standards that are not suitable for the country's national conditions may lead to an imbalance of labor resources coordination, increase the burden of labor protection, and raise domestic labor costs. Enterprises may respond by reducing their workforce, which may lower the level of labor protection in the country. Especially considering the significant economic development differences among different regions in China, adopting unified labor standards is not practical. Differentiated labor standards can be developed based on the economic and social development levels of different regions in China, aligning with different types of countries in the international community, and achieving labor clause requirements in a phased manner. By continuously improving the level of decent work, China can gradually align with international standards.

Thirdly, advocate the establishment of a friendly and cooperative dispute resolution mechanism or adopt the model of signing subsidiary labor agreements to address labor issues. As previously highlighted, labor clauses in regional trade agreements related to freedom of association, collective bargaining, etc., are contradictory to China's political system. In negotiations, communication and understanding should be strengthened to reduce institutional barriers. Efforts should be made to gain recognition from the contracting parties regarding the form and content of trade unions in China, while strengthening the capacity building of trade unions and improving the protection level of workers' rights to the maximum extent, minimizing the impact of institutional differences. In the absence of ratification of the basic labor conventions on forced labor, freedom of association, and collective bargaining rights, China can consider enacting separate legislation to clearly stipulate the relevant labor clauses accepted by China in regional trade agreements, providing domestic legal basis, and then adjust relevant laws and regulations in China in a timely manner to gradually align with international standards.

### **3.0 Methods**

#### **3.1 Variable Description**

(1) Dependent variable: Global Value Chain Embedding (GVC). This study uses two measurement methods to assess the GVC at both the national and provincial levels. The first

method is the WWYZ method proposed by WANG et al. (2017) for measuring the GVC at the national level. The second method is based on the research by SHAO and SUDANI (2017) to calculate the GVC embedding for each province. The formulas (18) and (19) illustrate these calculations.

(2) Independent variable: Decent Work Index (Labor). Against the backdrop of increasingly stringent international labor provisions for employment protection, this study primarily measures the level of decent work for urban labor in each province of China (excluding Tibet and the Hong Kong, Macao, and Taiwan regions) from 2014 to 2021 from a macro perspective. In the process of selecting indicators, a comprehensive index system consisting of four aspects, namely, income status, working environment, welfare protection, and employment rights protection, was established based on the understanding of decent work and relevant indicators of regional trade agreements on labor provisions. Table 4 shows this index system. This index system covers various factors that measure decent work in current research and calculates the level of decent work for the whole country and each province using the information entropy method.

(3) Mediating variable: Labor Cost (LC). For this variable, the average wage of urban employed persons is selected to represent it.

(4) Control variables: Based on existing research findings, this study also includes the following control variables to mitigate the potential endogeneity bias caused by omitted variables. 1) Regional innovation capacity (ZL), represented by the number of annual patent authorizations in the region. 2) Factor endowments 1 (YS), represented by the growth rate of fixed asset investment (excluding rural households) compared to the previous year. 3) Regional trade strength (QM), measured by the proportion of annual export value of operating units to local GDP. 4) Factor endowments 2 - Human capital level (JY), measured by the proportion of annual education expenditure to regional GDP.

### **3.2 Data Source**

This study analyzes panel data from China and 30 provinces (excluding Tibet and the Hong Kong, Macao, and Taiwan regions) from 2014 to 2021. The original data for the national GVC embedding is sourced from the UIBE GVC Index database of the University of International Business and Economics. The original data for provincial GVC embedding is sourced from the customs enterprise database and China Commodity Trade database. The original data for decent work is sourced from the China Labor Statistical Yearbook, China Statistical Yearbook, economic yearbooks of each province, national economic and social development statistical bulletins of each province, and the website of the National Bureau of Statistics. The original data for the remaining control variables are sourced from the website of the National Bureau of Statistics. The main regression analysis in this study has a "province-year" two-dimensional structure, and Table 2 presents the descriptive statistics of the variables.

Table 2: Descriptive Statistics of Variables

Variable	Sample Size	Mean	Standard deviation	Minimum value	Median	Maximum value
Global value chain embedding degree	240	0.249	0.208	0.004	0.175	1.206
Decent work level	240	0.500	0.078	0.301	0.508	0.729
Regional innovation capability	240	10.466	1.355	6.428	10.567	13.679
Factor endowment 1 - fixed asset investment growth rate	240	6.250	9.073	-56.600	7.200	23.400
Regional trade strength	240	0.128	0.120	0.004	0.079	0.582
Factor endowment 2 - human capital level	240	0.055	0.017	0.030	0.049	0.107
Labor cost	240	9.324	0.270	8.834	9.282	10.315

### 3.3 Model Specification

For panel data, the most important thing is to determine which model is suitable for analysis. Generally, panel data may be suitable for mixed effects models, fixed effects models, or random effects models. The Hausman test can be used to determine whether to choose a random effects model or a fixed effects model, while the F-test can determine whether to choose a fixed effects model or a mixed effects model. In this study, the Hausman test and F-test are mainly used to determine which model is appropriate for analyzing the data. The test results are shown in Table 3.

Table 3: Hausman test and F-test results

Hausman test			F test		
chi2 statistic	p value	result	chi2 statistic	p value	result
2.87	0.090	reject	24.23	0.000	reject

The Hausman test and F-test results both reject the null hypothesis significantly, indicating the presence of endogeneity issues caused by province and time effects. Therefore, this study ultimately adopts a fixed effects model for regression analysis. To investigate the impact of decent work intensity on global value chain integration, this study constructs the following baseline regression model.

$$GVC_{it} = a_0 + \beta_1 Labor_{it} + \beta_{2-5} Controls_{i,t} + \gamma_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Among them, GVC represents the global value chain embeddedness as the dependent variable,  $a_0$  is the constant term, Labor represents the core explanatory variable indicating the level of decent work, Controls is the set of control variables representing the coefficients of various explanatory variables,  $\gamma_i$  represents the provincial fixed effects,  $\lambda_t$  represents the time fixed effects, and  $\varepsilon_{it}$  represents the random disturbance term, where  $i$  and  $t$  represent the region and time, respectively.

(1) Benchmark regression analysis

Before conducting the regression, a Pearson correlation coefficient matrix test was performed. The results are shown in Table 4. The core explanatory variable, Labor, does not exhibit a significant positive correlation with GVC, which is inconsistent with the expected hypothesis H1. Considering that the correlation coefficient matrix can only measure the relationship between two variables and cannot eliminate the interference of control variables and potential variables (such as time effects and provincial effects), the results are only for reference, and further regression analysis is needed to determine the specific correlation. In addition, by judging whether the absolute value of the correlation coefficient between explanatory variables is greater than 0.9, the possibility of collinearity between variables can be preliminarily ruled out. Furthermore, a VIF test was conducted in this study, and the results are shown in Table 5. The average VIF was found to be 2.044, which is much lower than 10. Therefore, the possibility of multicollinearity between variables can be ruled out.

Table 4: Pearson Correlation Coefficient Matrix Test

	Global value chain embedding degree	Decent work level	Regional innovation capability	Factor endowment 1 - Fixed asset investment growth rate	Regional trade strength	Factor endowment 2 - Human capital level
Global value chain embedding degree	1.000					
Decent work level	-0.016	1.000				
Regional innovation capability	0.129**	0.204***	1.000			
Factor endowment 1 - Fixed asset investment growth rate	-0.014	-0.158**	0.061	1.000		
Regional trade strength	0.036	-0.102	0.629***	0.086	1.000	
Factor endowment 2 - Human capital level	-0.043	0.021	-0.761** *	-0.040	-0.530** *	1.000

Note: \*\*\*, \*\*, and \* represent significant levels of 1%, 5%, and 10%, respectively.

Table 5: Variance inflation factor

	VIF	1/VIF
Regional innovation capability	3.505	.285
Factor endowment 2 - Human capital level	2.583	.387
Regional trade strength	1.823	.549
Decent labor intensity	1.271	.787
Factor endowment 1 - Fixed asset investment	1.04	.962
Mean VIF	2.044	.

The benchmark regression results are shown in Table 6, with column (1) reporting the econometric results when only introducing the core explanatory variable of decent work intensity, and column (2) reporting the regression results after introducing control variables on this basis.

The regression results in column (1) show that, holding other conditions constant, a one-unit increase in decent work intensity will lead to a 0.145 unit increase in global value chain integration. This result is statistically significant at the 5% level, indicating that improving decent work intensity contributes to enhancing global value chain integration in various provinces of China. The regression results in column (2), which includes control variables, reveal that the coefficient estimate of decent work intensity is 0.185, slightly higher than in column (1), and it is statistically significant at the 1% level. This suggests that, after controlling for other relevant factors, improving decent work intensity has a stronger promoting effect on the enhancement of global value chain integration. The improvement in decent work intensity implies a systematic increase in urban labor income level, working environment, welfare protection level, and employment rights protection level. This improvement leads to the enhancement of employment environment, improvement in employment quality, and better protection of labor rights, while gradually increasing the income and welfare level of urban workers, improving the working environment, and enhancing their own employability. To some extent, this improves the work enthusiasm and life satisfaction of urban labor force, thereby increasing their work efficiency. As a result, Chinese enterprises have gained stronger competitiveness in the process of integrating into the global market, thereby promoting the overall improvement of global value chain integration in various provinces of China. This analysis indicates that hypothesis H1 is supported. After introducing control variables, indicators such as human capital level, regional innovation capability, fixed asset investment growth rate, and regional trade strength show a negative relationship with value chain integration, supporting hypotheses H3 and H4.

Table 6: presents the estimation results of the benchmark regression.

Variables	(1) Global Value Chain Integration	(2) Global Value Chain Integration
Decent level of labor intensity	0.145** (2.50)	0.185*** (3.43)
Regional innovation capability		-0.069** (-2.10)
Factor endowment 1 - Fixed asset investment growth rate		-0.001 (-1.40)
Regional trade strength		-0.715*** (-5.45)
Factor endowment 2 - Human capital level		-1.617
Constant term		(-0.77)
Constant term	0.158*** (4.87)	1.099** (2.18)
Sample size	240	240
R2 (coefficient of determination)	0.0208	0.0491
Number of groups	30	30
Province fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively.

(3). Robustness Analysis

This article conducts robustness analysis on the benchmark regression results from two aspects: changing the sample period and excluding special samples.

Firstly, changing the sample period. Considering that the selected sample period in this article includes the years after 2020, which was marked by the global COVID-19 pandemic, this sudden public health event caused a strict exogenous external shock to macroeconomic operations. Not considering this factor may lead to endogeneity issues in the model estimation results due to omitted variables. Therefore, this article performs regression analysis again by excluding the years after 2020 from the sample. Table 7 (1) presents the regression results, which show that although the significance level of the core explanatory variable slightly decreases, it still passes the significance test and remains consistent with the benchmark regression results, indicating robustness of the results.

Table 7: Robustness Analysis Results

Variables	(1)	(2)
	Global Value Chain Integration	Global Value Chain Integration
Decent level of labor intensity	0.243** (2.47)	0.202*** (3.55)
Regional innovation capability	-0.024 (-0.62)	-0.109** (-2.33)
Factor endowment 1 - Fixed asset investment growth rate	-0.001 (-1.29)	-0.001 (-1.15)
Regional trade strength	-0.951*** (-4.17)	-1.004*** (-4.85)
Factor endowment 2 - Human capital level	-0.398	-3.987*
Constant term	(-0.14)	(-1.77)
Constant term	0.486 (0.80)	1.667** (2.48)
Sample size	180	208
R <sup>2</sup> (coefficient of determination)	0.0519	0.0665
Number of groups	30	26
Province fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Note: \*\*\*, \*\*, \* respectively represent significant levels at 1%, 5%, 10% for statistical analysis.

Secondly, excluding special samples. In order to ensure the general applicability of the model estimation results and reduce the impact of special samples, this article removes the

municipalities directly under the central government from the sample, including Beijing, Shanghai, Chongqing, and Tianjin. If the results still hold, it indicates that the conclusions also apply to ordinary samples. From the regression results in Table 7 (2), it can be seen that the core explanatory variable, labor intensity, still exhibits a positive correlation with global value chain integration at a significance level of 1%, consistent with the benchmark regression results. The results remain robust.

#### (4) Endogeneity Analysis

To enhance the reliability of the results and address potential endogeneity issues, this study employs the system GMM and difference GMM methods for estimation. Columns (1) and (2) in Table 8 report the regression results using the system GMM and difference GMM, respectively. The autocorrelation tests for AR sequences indicate that the disturbance terms in both methods' regression results do not exhibit second-order or higher-order autocorrelation, which satisfies the assumptions of GMM regression. Additionally, the Sargan overidentification test accepts the null hypothesis of "all instrumental variables are valid," indicating the suitability of the model. The regression results reveal a significant positive correlation between the first lagged term and the current term of the dependent variable, demonstrating the existence of "temporal stickiness" among the dependent variables, which can be effectively addressed by the GMM method. From the results in columns (1) and (2) of Table 11, it can be observed that there is a significant positive correlation between decent work intensity and global value chain integration (at a significance level of 1%). This indicates that, after mitigating endogeneity issues, decent work intensity significantly promotes the improvement of global value chain integration, consistent with the baseline regression results. Therefore, the core conclusion of this study remains robust.

#### (5) Heterogeneity Analysis

Decent work intensity has a positive impact on the global value chain (GVC) integration. However, due to regional and sectoral differences, the effect of decent work intensity on GVC integration may vary significantly. Therefore, this study conducts sub-sample regressions based on geographical regions and industry types to examine the heterogeneous impact of decent work intensity on GVC integration.

On one hand, geographical heterogeneity analysis is conducted. Considering the differences in economic development, resource endowment, and innovation capabilities among regions, conducting sub-sample tests for different regions helps us better understand the relationship between decent work intensity and GVC integration. There are significant differences in the impact of decent work intensity on GVC integration among different regions.

Table 8: Endogeneity Analysis Results

Variable	(1)			(2)		
	Global	Value	Chain	Global	Value	Chain
	System GMM			Difference GMM		
	Integration			Integration		
L.GVC	0.5409***			0.3968***		
	(235.44)			(129.14)		
Decent level of labor intensity	0.0649***			0.0281***		
	(6.10)			(2.64)		
Regional innovation capability	-0.0178***			-0.0267***		
	(-13.39)			(-13.12)		
Factor endowment 1 - growth rate of fixed asset investment	-0.0004***			-0.0004***		
	(-3.48)			(-3.95)		
Regional trade strength	-0.9669***			-0.6743***		
	(-19.46)			(-10.55)		
Factor endowment 2 - level of human capital	-0.8696***			-2.8270***		
	(-4.41)			(-13.68)		
Constant term	0.4316***			0.6507***		
	(22.29)			(24.44)		
AR(2)	0.197			0.249		
Sargan	0.393			0.111		
Sample size	210			180		
Number of groups	30			30		
Fixed effects of provinces	Yes			Yes		
Fixed effects of years	Yes			Yes		

Note: \*\*\*, \*\*, \* respectively represent significant levels at 1%, 5%, 10% for statistical analysis.

According to the estimation results in columns (1), (2), (3), and (4) of Table 9, decent work intensity significantly promotes GVC integration in the eastern and central regions, with a stronger effect in the central region compared to the eastern region. However, the impact is not significant in the western and northeastern regions. The reason may be that the overall education level and employment capabilities of urban workers in the eastern and central regions are relatively high. They pay more attention to improvements in employment environment, income level, working conditions, welfare protection, and government guarantees for employment quality. They have a more noticeable perception and increased enthusiasm for work, and they also focus more on improving work efficiency. This indirectly helps Chinese exporting enterprises better establish themselves in the international market and positively affects regional GVC integration. The reason why the promotion effect of

decent work intensity on GVC integration in the central region is more significant than that in the eastern region may be that the overall development level in the eastern region is higher than that in the central region, and the decent work intensity is also relatively high. According to the theory of diminishing marginal effects, the perception of urban workers in the eastern region regarding further improvement in decent work intensity is weaker than that of urban workers in the central region. Moreover, the overall education level and employment capabilities of urban workers in the central region are slightly lower than those in the eastern region, and their overall work efficiency is relatively lower, leaving more room for improvement. Therefore, the same level of improvement in decent work intensity has a stronger incentive for urban workers in the central region, resulting in a more significant increase in work efficiency and a more noticeable effect on GVC integration.

On the other hand, heterogeneity analysis based on industry types is conducted. Different industry types have different sensitivities to decent work intensity regarding GVC integration. To examine the differences in the impact of decent work intensity on GVC integration in different industries, we group the analysis based on the classification standards of the National Bureau of Statistics. We discuss the heterogeneous impact of decent work intensity on GVC integration in the secondary and tertiary industries (since the primary industry mainly consists of rural laborers and this study focuses on the impact of decent work intensity on GVC integration of urban laborers, the primary industry is not considered). Columns (5) and (6) in Table 9 report the regression results, showing that decent work intensity significantly promotes GVC integration in both the secondary and tertiary industries, with a relatively stronger effect in the secondary industry compared to the tertiary industry. The reason may be that the secondary industry mainly includes manufacturing, mining, and energy supply, which have harsher working environments, and workers face more severe issues regarding employment rights and welfare protection, resulting in lower decent work intensity. On the other hand, the tertiary industry is mainly composed of the service sector, which has relatively safer working environments, and workers enjoy better employment rights and various welfare benefits, leading to higher decent work intensity. Therefore, the same level of improvement in decent work intensity brings a stronger sense of satisfaction to workers in the secondary industry, igniting their increased enthusiasm and work efficiency, resulting in a more significant increase in GVC integration compared to the tertiary industry.

Table 9: Heterogeneity Analysis Results

Variable	(1) East		(2) Central		(3) Western		(4) Western		(5) The secondary industry		(6) The tertiary industry	
	Global Chain Integration	Value	Global Chain Integration	Value	Global Chain Integration	Value	Global Chain Integration	Value	Global Chain Integration	Value	Global Chain Integration	Value
Decent level of labor intensity	0.384** (2.84)		0.934*** (4.94)		-0.037 (-0.54)		-0.037 (-0.54)		0.393*** (5.89)		0.150*** (3.79)	
Regional innovation capability	-0.156*** (-4.45)		0.137*** (6.86)		0.107 (1.68)		0.107 (1.68)		-0.293*** (-2.77)		0.039 (1.45)	
Factor endowment 1 - growth rate of fixed asset investment	0.005*** (3.72)		-0.005** (-3.70)		-0.000 (-0.39)		-0.000 (-0.39)		-0.002* (-1.94)		0.001* (1.76)	
Regional trade strength	-0.892** (-2.91)		-4.465*** (-6.41)		-0.819 (-1.62)		-0.819 (-1.62)		-1.959*** (-3.44)		-0.731*** (-12.40)	
Factor endowment 2 - level of human capital	1.056 (0.30)		17.664*** (8.46)		11.268*** (3.21)		11.268*** (3.21)		-4.712 (-0.92)		1.092 (1.14)	
Constant term	2.020*** (6.52)		-2.262*** (-7.34)		-1.480 (-1.66)		-1.480 (-1.66)		3.851** (2.57)		-0.236 (-0.66)	
Observations	80		48		88		88		240		240	
R <sup>2</sup>	0.269		0.576		0.188		0.188		0.0567		0.0707	
Number of groups	10		6		11		11		30		30	
Fixed effects by province	Yes		Yes		Yes		Yes		Yes		Yes	
Fixed effects by year	Yes		Yes		Yes		Yes		Yes		Yes	

Note: \*\*\*, \*\*, \* respectively represent significant levels at 1%, 5%, 10% for statistical analysis.

(6) Mechanism Verification

To investigate how the level of decent work influences the degree of global value chain integration through which pathways, while avoiding endogeneity issues caused by the traditional three-step method, this study adopts the two-step method proposed by Jiang Ting (2022) to establish Model (2) and Model (3) for testing the mediating effects. The results are shown in Table 10.

$$GVC_{it} = a_0 + \beta_1 Labor_{it} + \gamma_i + \lambda_t + \varepsilon_{it} \quad (21)$$

$$LC_{it} = a_0 + \beta_1 Labor_{it} + \beta_{2-5} Controls_{it} + \gamma_i + \lambda_t + \varepsilon_{it} \quad (22)$$

Among them, LC is the mediating variable, which represents labor cost (average wage of urban employed personnel). In the first step model (2), the regression between decent work and global value chain integration is shown in column (1) of Table 13, which is the baseline regression mentioned earlier. The results indicate that the core explanatory variable, decent work, has a positive impact on global value chain integration at a significance level of 1%.

Table 10: Mediation Effect Results

Variable	(1)		(2)	
	Global	Value	Chain	Labor cost
	Integration			
Decent level of labor intensity	0.063***		0.044**	
	(3.27)		(2.27)	
Regional innovation capability			0.016	
			(1.66)	
Factor endowment 1 - growth rate of fixed asset investment			-0.000	
			(-1.07)	
Regional trade strength			-0.092*	
			(-1.81)	
Factor endowment 2 - level of human capital			1.788***	
			(9.35)	
Constant term	9.606***		9.360***	
	(893.25)		(83.55)	
Observations	240		240	
R <sup>2</sup>	0.984		0.985	
Number of groups	30		30	
Fixed effects by province	Yes		Yes	
Fixed effects by year	Yes		Yes	

Note: \*\*\*, \*\*, \* respectively represent significant levels at 1%, 5%, 10% for statistical analysis.

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