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Optimization of Business Environment and Division of Labor in Global Value Chain

-- Based on the Analysis of OECD Member Countries

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Abstract

In order to further study the relationship between business environment and global value chain division position, this paper selects panel data of 36 OECD member countries from 2005 to 2016 on the basis of relevant literature, calculates the global value chain division position of OECD member countries by using the basic data provided by TiVA, and empirically analyzes the influence of business environment on the promotion of global value chain division position by using intermediary effect model, and studies the relationship between business environment sub-indicators and global value chain division position.The results show that: the optimization of business environment can obviously promote the division of labor in global value chains.T his promotion not only has direct effects, but also has indirect effects by stimulating innovative activities, improving terms of trade and strengthening financial development. The sub-indicators of business environment have different impacts on promoting the division of labor in global value chains.Based on this, some suggestions are put forward to optimize the business environment and enhance the division of labor status of global value chain.

Keywords

Business Environment; Global Value Chain; The Position in Global Value Chain; OECD.

1. Introduction

In recent years, the business environment has gradually become an important field in the fierce international competition. Governments have actively explored the construction of the business environment in order to unleash the vitality of market entities and social creativity and drive the sustained growth of the national economy.China has regarded optimizing the business environment as a basic goal of government governance.In October 2019, Premier Li Keqiang signed a State Council Order announcing the Regulations on Improving the Business Environment, which came into effect since January 2020.Compared with the traditional division of labor mode, under the global value chain division of labor mode of value appreciation link, the institutional environment factors are of important significance for a country or region to participate in the global value chain division, especially the high-end link of the global value chain, with stricter requirements on the institutional environment[1]. In the constituent elements of the institutional environment, the business environment is an important part that cannot be ignored.

Combining the optimization of the business environment with the improvement of the division of labor in the global value chain has become a research issue that we should pay special attention to at present.Can the business environment have an impact on the higher division of labor in the global value chain?How will the business environment have an impact?How impact the hierarchical indicators in the business environment on the global value chain?Based on this,

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this paper is based on factual characteristics, on the basis of relevant theory analysis, using panel data, through the business environment of the global value chain, and the grading indicators of business environment, analyze the influence of the global value chain, the research conclusion for the Chinese government to further optimize the business environment, improve the global value chain division status provides theoretical basis.

2. Review of Literature

The impact of the business environment on the division of labor in the global value chain is mainly reflected in enhancing the ability of enterprises to integrate into the global value chain by optimizing the business environment.Some studies believe that the fundamental factors that determine the division of labor in the global value chain is the quality of factor endowment and the matching quality between production factors owned by different countries or regions[2]. But in addition to the factor endowment, the business environment will also affect the division of labor in the global value chain. Existing research believes that the business environment will have a direct effect on the contract execution efficiency of micro enterprises, and a good contract execution efficiency will promote technological innovation by reducing the transaction costs of enterprises engaged in technology research and development activities[3]. At the same time, in countries or regions with highly efficient contract implementation, it is easier for enterprises to integrate into the global value chain division of labor system led by multinational corporations in developed countries[4][5]. In addition, some scholars believe that the business environment will strengthen intellectual property protection, and thus promote the rise of the global value chain by "reducing costs" and "encouraging innovation"[7][9]. Through literature review and combing, this paper found that most of the studies describe the business environment by starting from a single dimension and lack a comprehensive investigation of the indicators of various dimensions.

This paper, taking OECD countries as an example, adopts the relevant index in the business environment report released by the World Bank, not only examines the direct impact of the business environment on the division status in the global value chain, but also studies the indirect influence mechanism of the optimization in the global value chain from the innovation activities, the trade conditions and financial development. Specifically analyze and empirically test the impact of the sub-indicators in the business environment on the division of labor status in the global value chain, and provide a certain reference for the policy formulation of China to further optimize the business environment and enhance the division of labor status of the global value chain.

3. Empirical Inspection

3.1. Data Source and Measurement Method

3.1.1. TIVA Database Decomposition Method

Table 1. Total outlet breakdown

<table>
<tr><td colspan="4">Total Export (E)</td></tr>
<tr><td colspan="3">Domestic added Value (DV)</td><td rowspan="3">Foreign Value added FV(5)</td></tr>
<tr><td rowspan="2">Included in the final product, (1) is absorbed by the importing country</td><td colspan="2">Performance is an intermediate product export</td></tr>
<tr><td>(2) is directly consume by the importing countries</td><td>Produced by the importing countries and exported to the third country, the (3)</td><td>It was produced and processed by third countries and returned to the importer (4)</td></tr>
<tr><td colspan="2">Direct export of value-added (1)+ (2)</td><td>Indirect export of added value IV(3)</td><td></td><td></td></tr>
</table>

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According to the Koopman[10]The established KPWW total export decomposition method can divide the total export into domestic added value and foreign added value. Based on the two-country model, the total export can be extended to many countries to obtain a generally adapted general export decomposition model.

The TiVA database released at OECD also decomposes total exports into domestic added value and foreign added value[11]. Unlike the Koopman export decomposition method, the TiVA database divides domestic added value (DVA) into three parts, including four parts of domestic direct value added export (DDVA), indirect value export of domestic intermediates (IDVA), and domestic reimport Value-added Export (RDVA).Comparing the Koopman decomposition method with the TiVA database decomposition method, the (I) = (1) +(2), () =(3), () = (4).

Table 2. TiVA database total export breakdown

Total Export (E)			
Domestic added Value (DVA)			
Domestic Direct Value Value Export (I)	Domestic intermediate products added value indirect export (Ⅱ)	Domestic added added exports ()	Foreign added Value (FVA)

Source: prepared according to Koopman et al. (2010) and TiVA 2016 indicators-definition.

3.1.2. Metric Selection

(1) Global value chain status index of division of labor

Based on the accounting framework of trade value added value, Koopman and others investigate the status of specific industries in the international division of labor through the constructed "global value chain status index" (GVC Position Indices). among them, $\frac{IV}{E}$ known as the forward participation rate, $\frac{FV}{E}$ the backward participation rate, and GVC_position is the GVC status index. The meaning of GVC status index is that if a country participates in the GVC division of labor through production mainly through the import of intermediates from other countries, then the forward participation rate is less than the backward participation rate, then the country is in the relatively downstream position of GVC.On the contrary, if a country mainly exports raw materials or intermediates in the GVC international division of labor, then the forward participation rate is greater than the backward participation rate, then the country is relatively upstream of GVC[12]. That is, the smaller the status index, the lower a state's status in GVC; the larger the status index, the higher its status in GVC.The following expressions are given:

$$\mathrm{GVC\_Position}_{ir} = Ln\left(1+\frac{IV_{ir}}{E_{ir}}\right) - Ln\left(1+\frac{FV_{ir}}{E_{ir}}\right)$$

Among them, $GVC\_Position$ is the index of division of labor of the global value chain, IV the indirect export added value, FV the foreign value and E the added value export.

(2) Index of domestic added-value exports

Domestic added value export index mainly draws on the calculation method of the J ohnson & Noguera by calculating the domestic added value of the final product export, the domestic added value directly absorbed by the import countries in the intermediate product export, and the import countries reexport the proportion of domestic added value absorbed by the third countries. The specific calculation formula is:

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$$VAXR_j = \frac{VAX_i}{E_i}$$

Among them, $VAXR_j$ is the national j index of domestic value-added exports, VAX_i the domestic added value of economic i, and E_i the total export of economic i.

(3) Export technical complexity index

The export technology complexity index mainly judges the status of GVC based on the comparative advantage of export display. Haussmann et al measure the international technology competitiveness of the country by using the export trade data of exporting exporters and the per capita GDP level[13], The GVC status. This index can better highlight the leading position of technological progress in GVC upgrading.Export products from developed countries tend to have higher technical complexity, and have high added value, and are in a higher position in the value chain.On the contrary, developing countries have low technological complexity and a correspondingly low position in the value chain.Therefore, the greater the export technology complexity index, the higher a country stands in GVC, and the lower vice versa[14]. Haussmann has proposed a two-step computation method. The first step measures the technical complexity index (technological sophistication index, TSI) of each export, as follows:

$$TSI_k = \sum_j \frac{x_{jk} / X_j}{\sum_j \left(x_{jk} / X_j\right)} Y_j$$

Among them, TSI_k namely the technical complexity index of export commodities k . x_{jk} is j the export of goods k , X_j the total export of the country j , Y_j for the per capital income level of the country j , GDP usually expressed per capital.The second step is to calculate the overall export technology complexity of a country through the following formula:

$$EXPY = \sum_k \frac{x_k}{X} TSI_k$$

Among them, $EXPY$ is the export technical complexity index of a country, x_k the export amount of the commodities of the country k , X the total export amount of the country, and TSI_k the technical complexity index of the commodities k .

(4) The business environment index

Among the most authoritative and influential studies on the business environment, the bank is the Global Business Environment Report released by the World Bank.Take the latest report in 2020, for example, the report includes 10 sets of indicators, involving 190 economies, the evaluation system based on the enterprise life cycle, from entrepreneurship, site, financing, daily operation and problems five stages, according to the enterprise life cycle, get ten common indicators: start business, construction permit, power, property registration, credit, protect a few investors, tax payment, cross-border trade, execution contract and bankruptcy.This paper uses the value of the National Business Environment Index (EI) to measure the business environment of OECD Member States.

3.2. Factual Characteristics

Given the match between the data, the data covers an annual range of 2010-2016, including a sample economy of 36 OECD member states.According to the calculated global value chain division of labor status index, domestic value-added export proportion index, and export technology complexity index, this paper draws the scatter linear fitting map between the three variables and the business environment index, see the figure below:

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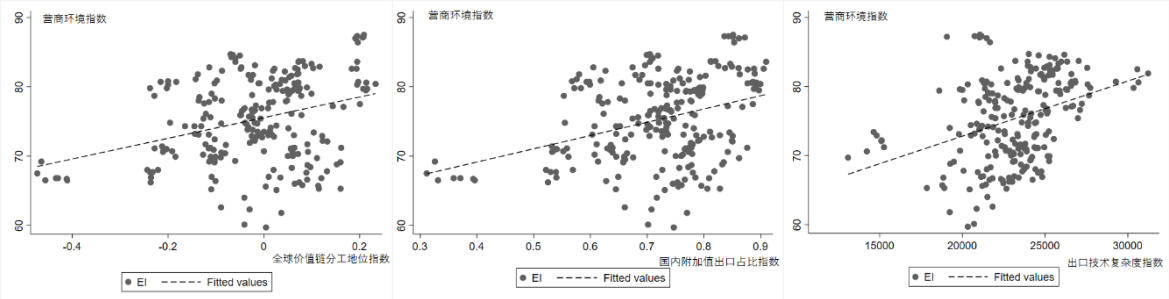

Figure 1. Scatter fitting map of the business environment index and the division of labor in the global value chain

From the business environment index and representing the global value chain divergence between the index can be obvious, three indicators and the business environment index show obvious positive correlation, namely the higher the business environment index, the higher the GVC _Position, VAXR, EXPY index, also initially proved that the business environment optimization on the global value chain division of labor status may have positive promotion.At the same time, it can also be seen that the business environment index of OECD Member States is more than 60, but the difference of business environment is also performing significantly in different countries and regions[15], As shown in the 2020 Business Environment Report released by the World Bank, Greece's business environment index is only 68.4, while the U. S. business index is as high as 84. In addition, there is an undisputed fact that developed countries like the United States have always been the leader and controller of the global value chain division system, while developing countries like China are at the middle and low end of the global value chain division position.

Therefore, this paper puts forward the hypothesis that the optimization of the business environment plays a significant role in improving the division of labor status in the global value chain.In addition, the optimization of the business environment will affect the change of the division of labor status in the region of the global value chain through factors such as the innovation activities and trade conditions of a country or region.

3.3. Model Setting

But analysis solely on scatter fit plots is far from enough.Refer to the existing research literature on the influencing factors of the division of labor in the global value chain[16][20], This paper presents the hypothesis that business environment optimization works through influencing a country's innovation activities (as RD), conditions of trade (as TOT), financial development (FD)[21]Such mechanisms affect the division of labor in the global value chain. In this paper also selects foreign investment (FDI), service ratio (SER), human capital level (EDU), economic freedom (EFI), per capita GDP (PGDP), total population (POP) as the control variables. In order to eliminate data volatility to the fluctuation level of other variables, per capita GDP (PGDP) and total population (POP) were treated in the measurement regression process.Given the availability of the data, the 36 member states of the OECD were selected as empirical study subjects, containing the data from 2010-2016.This paper sets the following panel data model to measure and analyze the impact of the business environment on the division of labor in the global value chain and its intermediary role:

$$G_{i,t} = \alpha_0 + \beta_t + \lambda_0 EI_{i,t} + \lambda_1 FDI_{i,t} + \lambda_2 SER_{i,t} + \lambda_3 EDU_{i,t} + \lambda_4 EFI_{i,t} + \lambda_5 \ln PGDP_{i,t} + \lambda_6 \ln \mathrm{POP}_{i,t} + \eta_i + \varepsilon_{i,t}$$

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$G_{i,t}$ Among them, said the annual global division of value chain status index, with $GVC\_Position$、$VAXR$、$EXPY$ Characterization of three variables; α_0 representation of the constant term of the regression model; β_t representation Time effect terms unrelated to the sample individual in the panel regression model; λ_0 _ λ_6 the action coefficient of the corresponding explanatory variable on the division of labor in the global value chain respectively; η_i the individual effect items not observable under panel conditions; $\varepsilon_{i,t}$ the residual term, the random effects of individual and time effects in the regression.

The underlying data used by the explained variable, the status index of the Global Value Chain, came from the latest TiVA database published by OECD (2018edition), which contains input-output data from 2010-2016 among the 36 member states in the OECD. The core explanatory variable Business Environment Index (EI) was derived from the Global Business Environment Report published by the World Bank Group, which contains business environment data from OECD members from 2010-2016. The measures and data sources of the remaining variables are summarized in the following table:

Table 3. For variable selection and data sources

Variable	Variable name	Variable measure	Data source
GVC	Division of labor status index	Global value chain division of labor position index	The OECD-TiVA database
RD	Innovation activity index	The proportion of R & D expenditure accounted for GDP	The World Bank database
TOT	Trade conditions index	Price trade conditions	United Nations UNNations Trade Development Conference (UNCTAD) statistical database
FD	Financial Development Index	The sum of total domestic private sector credit and share market value to GDP	The Global Financial Development Database (GFDD)
FDI	Foreign direct investment	The net inflow of FDI accounted for GDP	The IMF Balance of payments Database
SER	The proportion of service industry	The added value of the service industry accounted for GDP	The World Bank database
EDU	Human capital level	Higher Education enrollment rate	The UNESCO (UNESCO) Statistical Database
EFI	Economic freedom	Comprehensive indicators of a country's tax rate system, legal system, trade openness and government efficiency	The Fraser Institue database
PGDP	GDP per capita	Gross domestic product was divided by the mid-annual population	The World Bank database
POP	Total population	-	The World Bank database

4. Analysis of the Empirical Results

4.1. The OLS Regression Results of the Benchmark Regression

To eliminate the volatility of the data as much as possible to the fluctuation level of other variables without affecting the regression results, we applied logarithize the export technical complexity index (EXPY) during the measurement regression process[22]. In this paper, the impact of the key explanatory variable of the business environment index was considered

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separately, and then included in other control variables for OLS regression analysis. In order to solve the endogeneity problem that may be caused by missing variables, a fixed effect model was selected at regression based on the results of the hausman test. During the regression, considering heterovariance, a clustering robust standard error was used and the resulting regression results are reported in the following table:

Table 4. OLS regression estimation results

Project	GVC(1)	GVC(2)	VAXR(3)	VAXR(4)	lnEXPY(5)	lnEXPY(6)
EI	0.007***	0.005***	0.007***	0.004***	0.006***	0.003**
	(8.15)	(4.22)	(8.53)	(4.11)	(16.78)	(2.50)
FDI	-	-0.003***	-	-0.003***	-	0.000
		(-4.97)		(-4.47)		(0.13)
SER	-	0.004***	-	0.003***	-	-0.005***
		(9.03)		(5.81)		(-6.71)
EDU	-	0.002***	-	0.002***	-	-0.001***
		(4.37)		(4.15)		(-6.88)
EFI	-	0.011	-	0.015	-	-0.054**
		(0.70)		(1.25)		(-2.50)
lnPGDP	-	0.005	-	0.019*	-	0.137***
		(0.51)		(2.20)		(14.41)
lnPOP	-	0.029***	-	0.021***	-	0.016***
		(14.41)		(9.43)		(7.07)
_cons	-0.558***	-1.393***	0.231***	-0.505***	9.561***	8.997***
	(-8.37)	(-12.17)	(3.99)	(-5.81)	(333.33)	(65.56)
Sample size	240	213	240	213	240	213

Note: The numbers in the square brackets under the estimation coefficient are the t statistic of the coefficient estimates, are significant at 0.1,0.05,0.01, respectively. *, **, ***.

The regression results can be seen in Table 4. Among the three explained variables representing the division of the global value chain, the regression estimation factor alone is positive and significant at the level of 0.01, which shows that the business environment optimization obviously promotes the improvement of the division of the global value chain, and also reflects the robustness and reliability of the estimation results.After incorporating other explanatory variables and control variables, the coefficient estimate of the business environment index has not been changed substantially, showing good stability and logical consistency, which more shows that the business environment has significantly improved and improved the division of labor in the global value chain.

4.2. Robustness Test

Due to the possible two-way role between the business environment and the division of labor in the global value chain, that is, that is, the optimization of the global value chain promotes the division of labor in the global value chain.

Improvement will also lead to the optimization of the business environment, and then lead to the estimation bias due to the endogenous problems of variables. to solve the endogenous problem caused by mutual causality, the business environment index lags behind one phase and was included in the model as endogenous variables, and the following table shows the regression results:

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Table 5. Results of the robustness test

Project	GVC(1)	VAXR(2)	lnEXPY(3)
LEI	0.002**	0.003**	0.005**
	(2.19)	(2.57)	(2.44)
FDI	0.000	0.000	-0.000
	(0.12)	(0.12)	(-0.33)
SER	0.002*	-0.001	-0.007***
	(1.83)	(-1.18)	(-3.00)
EDU	-0.000	-0.001**	0.000
	(-1.21)	(-2.35)	(0.12)
EFI	0.010	0.028*	0.088***
	(0.64)	(1.75)	(2.94)
lnPGDP	0.021	-0.018	-0.032
	(0.98)	(-0.82)	(-0.77)
lnPOP	0.143	0.207**	0.518***
	(1.49)	(2.09)	(2.78)
_cons	-2.918*	-2.703*	1.400
	(-1.86)	(-1.67)	(0.46)
Sample size	182	182	182

Note: The numbers in the square brackets under the estimation coefficient are the t statistic of the coefficient estimates, are significant at 0.1,0.05,0.01, respectively. *, **, ***.

The robustness test in Table 5 showed that the coefficient estimates remained significant after incorporating the model, showing good agreement with the regression results above.

4.3. Measurement Test of the Intermediate Action Mechanism

It can be seen from the above measurement test results that the optimization of the business environment really has a positive effect in improving the division of labor status in the global value chain. This paper believes that this positive effect not only has a direct effect, but also through affecting innovation activities, trade conditions and financial development intermediary effect. First of all, the main advantage of a country or region to participate in global competition is technological innovation. The business environment, by encouraging a country's technological innovation activities, will stimulate the vitality of a country's independent innovation, encourage enterprises to upgrade the industry in the direction of improving the core competitiveness, and thus enhance the status of the country or region in the division of labor in the global value chain [23]. In fact, the improvement of the division of labor in the global value chain is essentially the result of innovation and technological progress. Secondly, a good business environment is conducive to attract the gradient transfer of high-end link, thus more conducive to innovation activities, not only can enhance the added value creation ability, but also because of the national and regional "brand effect" and "image effect" produce a certain price bonus, and then affect the price and quantity of import and export goods of the country and region.The improvement of trade conditions will affect the price of goods, thus improving the value-added creation capacity of a country or region. And the improvement of the division of labor status of the global value chain, from the perspective of efficiency, is specialized in the production link with higher added value[24]. Finally, in areas with a good business environment, the government covers property rights protection with administrative examination and approval[25] The government has done better in abiding by the law and developed the financial market better.Financial development can encourage enterprises to invest in scientific and technological innovation, and expand the external financing channels for

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enterprise research and development projects by alleviating the financing constraints faced by technology enterprises and individuals[26], Provide financial support for more innovative projects, and then enhance the division of labor status in the global value chain.To test the above assumptions, this paper draws on the mediation effect model introduced by Wen Zhonglin et al[27]stepwise test regression analysis was performed and the results were as follows:

Table 6. Test results of the mediation mechanism of action

Project	GVC(1)	RD(2)	TOT(3)	FD(4)	GVC(5)	GVC(6)	GVC(7)
EI	0.005***	0.063***	-1.239***	2.322**	0.006***	0.008***	0.003*
	(3.33)	(4.26)	(-3.21)	(2.30)	(4.04)	(7.41)	(1.95)
RD	_	_	_	_	-0.040***	_	_
					(-5.38)		
TOT	_	_	_	_	_	0.003***	_
						(13.28)	
FD	_	_	_	_	_	_	-0.003***
							(-4.67)
FDI	-0.003***	-0.012**	-0.109	-0.059	-0.004***	-0.003***	0.000*
	(-5.29)	(-2.28)	(-0.74)	(-0.16)	(-6.40)	(-6.56)	(1.72)
SER	0.004***	-0.008	-1.371***	3.849***	0.003***	0.008***	0.002
	(3.22)	(-0.74)	(-4.35)	(4.71)	(2.76)	(8.13)	(1.19)
EDU	0.002***	0.006	0.088	0.449*	0.002***	0.002***	0.002***
	(5.22)	(1.64)	(0.88)	(1.78)	(5.73)	(6.32)	(4.57)
EFI	0.011	-0.929***	33.820***	51.829***	-0.015	-0.080***	0.022
	(0.51)	(-3.98)	(6.00)	(3.43)	(-0.61)	(-4.55)	(0.83)
lnPGDP	0.005	0.854***	3.130	37.078***	0.042***	-0.004	-0.007
	(0.35)	(6.64)	(0.89)	(3.87)	(2.85)	(-0.35)	(-0.39)
lnPOP	0.029***	0.062	-0.054	12.459***	0.034***	0.029***	0.028***
	(6.32)	(1.48)	(-0.05)	(3.60)	(7.84)	(8.71)	(4.55)
_cons	-1.393***	-5.342***	-17.652	-1275.251***	-1.645***	-1.346***	-1.120***
	(-8.34)	(-3.18)	(-0.41)	(-11.23)	(-9.26)	(-11.04)	(-4.26)
Sample size	213	203	213	165	203	213	165

Note: The numbers in the square brackets under the estimation coefficient are the t statistic of the coefficient estimates, are significant at 0.1,0.05,0.01, respectively. *, **, ***.

Based on the regression results in Table 6, the coefficient estimates of the business environment index in the first column are significant at 0.01; in the regression result of the second effect and the fourth column, the main effect of the main environment shows the mediation effect, namely the intermediary mechanism.

In the above empirical analysis, it can be concluded: First, the optimization of the business environment will play a positive role in the improvement of promoting the division of labor in the global value chain.Second, the impact of the business environment on the division of labor in the global value chain is affected not only through direct effects, but also through indirect effects such as innovation activities, trade conditions and financial development.

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5. Analysis of the Impact of Business Environment Subindicators on the Division of Labor in the Global Value Chain

5.1. Status Quo Analysis

According to the empirical analysis results mentioned above, the improvement of the business environment of a country or region will have a positive effect on the improvement of the division of labor status of the global value chain in the region. Therefore, exploring the influence of specific indicators in the business environment on the division of labor status in the global value chain has a strong reference value.Before the empirical analysis, the descriptive statistics for each variable are as follows:

Table 7. Descriptive statistics of the variables

Variable	Variable name	mean	Minimum value	Maximum value	standard deviation
S tar	Start an enterprise	85.96	52.1	100	8.84
Perm	Handle construction permit	71.69	40.0	91.6	10.19
Elec	Get power	80.70	55.3	99.9	11.18
Prop	Property registration	73.79	33.9	97.1	15.09
Cred	Get credit	67.12	15	100	17.48
Prot	Protect a small minority of investors	61.78	30	96.7	13.69
Tax	Pay taxes	79.17	42.4	95.3	9.71
T rad	Cross-border trade	85.94	56.7	100	7.40
Cont	Contract execution	68.63	34.5	86	10.34
Clos	Bankruptcy handling	68.59	22.9	93.9	15.44

It can be seen from the above descriptive statistics that the enterprise business environment indicators of OECD member states are high, and the data show that 80% of OECD countries' enterprise business environment index ranks in the top 30. At the same time, a self-evident fact is that the enterprise business environment of most developing countries lags behind developed countries, so the economic development also lags behind developed countries[28]. The following table is the ranking of China's business environment among the 190 economies as published in the Global Business Environment Report 2020:

Table 8. Ranank of Enterprise Business Environment Index in 2019

Project	Ranking
Business environment convenience	31
Start an enterprise	27
Apply for a construction permit	33
Get power	12
Register property	28
Get credit	80
Protect a small minority of investors	28
Pay taxes	105
Cross-border trade	56
Execute the contract	5
Handle bankruptcy	51

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As can be seen from the above table, Credit ranking 80, Tax Payment ranking 105, Cross-border trade and bankruptcy handling ranking 56 and 51, respectively, It can be seen from the subindicators that the business environment of Chinese enterprises lags seriously behind the developed countries, The main performance is: in setting up a business, There are complicated problems of opening procedures and high costs; In terms of handling the construction permit, There are the problems of complex handling procedures and high handling costs; In respect of registering the property, There are many mortgage procedures, Handle for a long time and other problems; In gaining access to credit, The lack of communication of corporate credit information, There are problems such as difficult enterprise loans, financial institutions dare not borrow; In protecting a minority of investors, There are serious enterprise transaction opacity and enterprise agency problems; In terms of the tax payment, There are problems of dealing with tax procedures, more time spent and high tax level; In the area of cross-border trade, There are problems such as long customs clearance time and unreasonable charges at customs clearance ports; In handling bankruptcy, There are problems of long trial of cases and low efficiency of disposal of bankruptcy assets.Therefore, it is very necessary to improve China's business environment through reform [29].

5.2. Empirical Analysis

5.2.1. Regression Results

Given the data availability, This paper selects the nine major business environment index data of OECD member States from 2005-2015 (since power indicators are only obtained from 2010 and beyond, Therefore, is not included in the model), The nine major indicators are S tar t Up Business (S tar), Construction Permit (perm), Property Registration (Prop), Get Cred it (Cred), P rot ection of Minority Investors (P rot), Tax Payment (Tax), Cross-border T rad e (T rad), Cont ract Execution (Cont), Bankruptcy (Clos), The data comes from the business environment report released by the World Bank.This paper builds the following model,

$$G_{i,t} = \alpha_0 + \beta_t + \lambda_1 Star_{i,t} + \lambda_2 Perm_{i,t} + \lambda_3 \mathrm{Pr}op_{i,t} + \lambda_4 \mathrm{Cred}_{i,t} + \lambda_5 \mathrm{Pr}ot_{i,t}$$
$$+ \lambda_6 Tax_{i,t} + \lambda_7 Trad_{i,t} + \lambda_8 Cont_{i,t} + \lambda_9 Clos_{i,t} + \lambda_{10} FDI_{i,t} + \lambda_{11} SER_{i,t}$$
$$+ \lambda_{12} EDU_{i,t} + \lambda_{13} EFI_{i,t} + \lambda_{14} \ln PGDP_{i,t} + \lambda_{15} \ln \mathrm{POP}_{\mathrm{i,t}} + \eta_i + \varepsilon_{i,t}$$

Among them, $G_{i,t}$ said the annual global division of value chain status index, with $GVC\_Position$、$VAXR$、$EXPY$ Characterization of three variables; α_0 representation of the constant term of the regression model; β_t representation Time effect terms unrelated to the sample individual in the panel regression model; λ_1 - λ_{15} the action coefficient of the corresponding explanatory variable on the division of labor in the global value chain respectively; η_i the individual effect items not observable under panel conditions; $\varepsilon_{i,t}$ the residual term, the random effects of individual and time effects in the regression.

During regression, considering the problems of heterovariance robust standard error, the resulting regression results are reported in the table below:

It can be seen from the regression results of Table 9 that the effect of the first-level indicators of the business environment on the division of labor status in the global value chain is different. To the global value chain division of labor status index $GVC\_Position$ For example, Opening enterprise (Starting a business), property registration (Registering property), protected minority investors (Protecting minority investors) coefficient estimates are greater than zero and significant at 0.01, indicating a significant improvement in the division of labor in the global

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value chain; while the contract execution (Enforcing contracts) coefficient estimate is positive, positively promoting the division of labor in the global value chain.

Table 9. Results of OLS regression estimates

Project	GVC(1)	VAXR(2)	lnEXPY(3)
Star	0.002***	0.002***	0.002**
	(2.71)	(2.72)	(2.27)
Perm	-0.002***	-0.002***	-0.001*
	(-2.78)	(-2.96)	(-1.78)
Prop	0.004***	0.003***	-0.003***
	(8.29)	(7.45)	(-5.72)
Cred	-0.000	0.000	0.002***
	(-0.13)	(0.39)	(6.03)
Prot	0.003***	0.002***	-0.002***
	(5.18)	(5.04)	(-4.60)
Tax	-0.000	0.001**	-0.001
	(-0.38)	(2.28)	(-1.39)
Trad	-0.003***	-0.002**	0.004***
	(-3.87)	(-2.59)	(4.46)
Cont	0.001	0.000	0.000
	(1.32)	(0.34)	(0.31)
Clos	-0.001***	-0.002***	0.002***
	(-2.94)	(-4.98)	(4.72)
FDI	-0.002***	-0.002***	-0.000
	(-4.46)	(-4.24)	(-0.34)
SER	0.007***	0.004***	-0.007***
	(6.33)	(4.01)	(-5.92)
EDU	0.003***	0.002***	-0.001**
	(7.56)	(6.83)	(-2.40)
EFI	-0.045**	-0.053***	-0.004
	(-2.29)	(-2.92)	(-0.20)
lnPGDP	0.033***	0.050***	0.129***
	(2.78)	(4.59)	(10.10)
lnPOP	0.043***	0.038***	-0.003
	(9.47)	(9.04)	(-0.58)
_cons	-1.429***	-0.592***	8.915***
	(-9.16)	(-4.15)	(52.96)
Sample size	322	322	322
R^2	0.560	0.526	0.647

Note: The numbers in the square brackets under the estimation coefficient are the t statistic of the coefficient estimates, are significant at 0.1,0.05,0.01, respectively. *, **, ***.

Coefficient estimates for handling construction permits (Dealing with construction permits), obtaining credit (Getting credit), tax payment (Paying taxes), cross-border trade (Trading across borders), bankruptcy handling (Resolving insolvency) was negative, likely due to step-by-step restrictions in the process of optimizing the business environment. At the same time, regardless of what index represents the division of labor in the global value chain, the coefficient estimate of the startup enterprise (Starting a business) is greater than zero and

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significant, indicating that it does have a positive effect on promoting the division of labor in the global value chain.

5.3. Test of Robustness

[10][11]Considering the possible endogenous problems caused by sample selective bias, this paper replaces the dependent variables based on the original model and draws on Koopman et al. (2014 [11]), 2014) and decompose the bilateral total export into 16 parts in 16 parts according to the Wang G (2015 [14]) value source. The regression results are shown in the table below:

Table 10. Test of robustness

Project	GVC(1)	VAXR(2)	lnEXPY(3)	DVR(4)
Star	0.002***	0.002***	0.002**	0.002***
	(2.71)	(2.72)	(2.27)	(2.60)
Perm	-0.002***	-0.002***	-0.001*	-0.002***
	(-2.78)	(-2.96)	(-1.78)	(-2.94)
Prop	0.004***	0.003***	-0.003***	0.003***
	(8.29)	(7.45)	(-5.72)	(7.42)
Cred	-0.000	0.000	0.002***	0.000
	(-0.13)	(0.39)	(6.03)	(0.40)
Prot	0.003***	0.002***	-0.002***	0.002***
	(5.18)	(5.04)	(-4.60)	(4.71)
Tax	-0.000	0.001**	-0.001	0.002**
	(-0.38)	(2.28)	(-1.39)	(2.45)
Trad	-0.003***	-0.002**	0.004***	-0.002*
	(-3.87)	(-2.59)	(4.46)	(-1.81)
Cont	0.001	0.000	0.000	0.000
	(1.32)	(0.34)	(0.31)	(0.40)
Clos	-0.001***	-0.002***	0.002***	-0.003***
	(-2.94)	(-4.98)	(4.72)	(-5.23)
FDI	-0.002***	-0.002***	-0.000	-0.001***
	(-4.46)	(-4.24)	(-0.34)	(-3.10)
SER	0.007***	0.004***	-0.007***	0.004***
	(6.33)	(4.01)	(-5.92)	(3.86)
EDU	0.003***	0.002***	-0.001**	0.002***
	(7.56)	(6.83)	(-2.40)	(6.14)
EFI	-0.045**	-0.053***	-0.004	-0.064***
	(-2.29)	(-2.92)	(-0.20)	(-3.24)
lnPGDP	0.033***	0.050***	0.129***	0.056***
	(2.78)	(4.59)	(10.10)	(4.90)
lnPOP	0.043***	0.038***	-0.003	0.043***
	(9.47)	(9.04)	(-0.58)	(9.39)
_cons	-1.429***	-0.592***	8.915***	-0.707***
	(-9.16)	(-4.15)	(52.96)	(-4.57)
Sample size	322	322	322	288
R^2	0.560	0.526	0.647	0.519

Note: The numbers in the square brackets under the estimation coefficient are the t statistic of the coefficient estimates, are significant at 0.1,0.05,0.01, respectively. *, **, ***.

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The robustness test results in the above table do not differ fundamentally from the previous regression results, showing the reliability and stability of the aforementioned regression results. [30]

6. Research Conclusions and Policy Suggestions

Using the basic data in the latest TIVA database published by OECD in 2018 and the business environment data released by the World Bank, we empirically test that the business environment optimization has a positive effect on the promotion of division of labor in the global value chain, which not only has a direct effect, but also affects indirect effects such as innovation activities and trade conditions.At the same time, by examining the impact of the sub-indicators of the business environment on the division of labor of the global value chain, we found that there are large differences between the subdivision indicators.

Based on the above research conclusions, the following suggestions are put forward: First, the improvement of hard indicators.In the business environment report released by the World Bank, there is a large gap between China and other countries in terms of obtaining credit, tax payment, cross-border trade and bankruptcy handling. Therefore, strengthening weak links should become the focus of China to further optimize the business environment.In terms of obtaining credit, the government, small and medium-sized enterprises, banks and financial institutions work together to provide greater financial products for small enterprises, implement tax reduction policies, reduce the burden of enterprises, expand intelligent tax handling, improve tax efficiency and reduce tax time.In terms of cross-border trade, reduce the overall customs clearance time by implementing relevant policies, simplify import and export supervision documents, and clean up unreasonable port standards and non-compliance charges; handle bankruptcy, strengthen the management team construction, establish a quick trial mechanism for simple cases, and improve the enterprise exit procedures.Second, the improvement of the soft environment.We should mobilize the enthusiasm of local governments and economic administrative departments to truly serve the market economy. Through specific and precise measures, we will promote the realization of high-quality and efficient service covering the whole process from the establishment, expansion to the end of the enterprise.Third, change your ideas.Optimizing the business environment should not only stay on the surface, it is not enough to improve the ranking, more should pay attention to whether the impact after the optimization of the business environment can bring a broader and far-reaching impact through mediation.We will pay attention to the business environment on stimulating the intermediary role of innovation activities, improving trade conditions, residents 'entrepreneurial tendencies and infrastructure, thus enhancing China's position in the division of labor in the global value chain.

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