Empirical study on the impact of e-commerce level on the participation and positions of countries in the global value chain

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Abstract. At the end of the 20th century, with the rise of the Internet, the emergence of e-commerce has brought new ideas for the promotion of global value chains. In this context, this paper examines the impact of e-commerce on the global value chain position of participating countries. This paper constructs an e-commerce development index from three aspects: Internet infrastructure, e-commerce application ability and trade facilitation. Using the data from the World Bank and the Universal Postal Union, it calculates the e-commerce development index of 46 countries from 2007 to 2021, and analyzes the current situation of e-commerce development in the sample countries. In addition, this paper uses UIBE GVC database to measure the global value chain position index and participation index of the 36 countries as explained variables, takes e-commerce development index as explanatory variables, and makes empirical analysis by using fixed effect model. The results show that e-commerce can significantly promote the status of each country in the global value chain. The promotion effect on higher income countries is not significant.

Keywords: E-commerce, Global Value Chain, E-commerce development index

1 Introduction

With the continuous progress of science and technology and the acceleration of globalization, e-commerce has become an indispensable part of today's global economy, and countries are constantly. Take China as an example, according to the data of the General Administration of Customs of China, the size of China's cross-border export e-commerce market in 2022 will reach 12.3 trillion yuan, compared with 11 trillion yuan in 2021, an increase of 11.81%. The import cross-border e-commerce market reached 3.4 trillion yuan, up 6.25% year-on-year from 3.2 trillion yuan in 2021. As a new form of commerce, e-commerce not only changes the circulation of products and services, but also reconstructs the global production and supply chain network[1]. While e-commerce is valued by countries all over the world and continues to develop, it will subvert and reshape traditional business models in their own countries. Due to the different levels of development and infrastructure construction in different countries, the development of e-commerce in different countries will also affect the position of each country in the global value chain, so e-commerce will have a profound impact on the development and evolution of the global value chain[2].

First of all, as mentioned above, e-commerce, as an emerging business form, is sweeping the global market[3]. Unlike traditional trade, the distance between upstream and downstream

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enterprises and the market is being shortened, which represents the reduction of costs, such as matching costs, marketing costs, financing costs, etc., which will become an opportunity for the country to rise in the new era. Thereby changing its position in the global value chain[4].

The development of global value chain theory has been relatively mature and perfect, and related research has been sought after by the academic circle and become the forefront of the industry. E-commerce is a new thing that developed gradually with the rise of the Internet at the end of the 20th century. So far, the definition of e-commerce has not been clear in the academic circle, and the development of relevant theories has not been perfected. However, more scholars focus their research on the relationship between digitalization and global value chain, and less on the status of e-commerce and global value chain, and the degree of participation in global value chain. From a theoretical point of view, this paper combined with existing literature, by constructing an e-commerce index that can reflect the development of e-commerce in various countries, combined with 2007-2022 panel data for empirical testing, trying to draw a more comprehensive conclusion, so as to enrich the related research of e-commerce and global value chain.

2 Literature

Su Chaoyan (2024) studied and analyzed the impact of cross-border e-commerce development on the import of intermediate goods from the perspective of global value chain, and concluded that the implementation of cross-border e-commerce policies is conducive to promoting the export quality of intermediate goods. Before and after the implementation of cross-border policies, the development of cross-border e-commerce has a significant positive impact on the scale and quality of intermediate goods imports, and a significant negative impact on the import price of intermediate goods[5];Li Xiaodao (2023) studies the impact of e-commerce on the global value chain embedding of "One Belt, One Road" countries, and explores the impact of the development of e-commerce on the global value chain embedding of "One Belt, One Road" from the perspective of spatial spillover. The study expounds the spatial spillover effect of global value chain embedding from the perspective of spatial spillover. This paper empirically studies the role of e-commerce in promoting global value chain embedment in countries along the Belt and Road;Liu Jing (2017) found in his research and analysis that cross-border e-commerce has effectively improved the drawbacks of traditional trade modes, such as trade ecological environment, unreasonable manufacturing industry structure and regional trade imbalance, by optimizing traditional trade processes and innovating trade modes, and provided a new path for the upgrading of China's trade value chain;Gereffi (2001a) compared the value chain driving models and found that in addition to the original two driving chains dominated by producers and buyers, a new value chain based on the Internet is taking shape. Although the development of the Internet was in its infancy at the time, the Internet would lead to the formation of information-based value chains. The emergence of the Internet has made all industries more consumer-oriented in a new sense, and the power of manufacturers and middlemen is gradually being weakened.To sum up, the research on the relationship between e-commerce and global value chain is still relatively scarce.

3 E-commerce development index construction

3.1 Index selection

According to the above, this paper selects the comprehensive index measurement method to construct the e-commerce development index.This paper selects three first-level indicators: infrastructure, e-commerce application ability and trade. In the actual calculation, considering the availability of data, a total of 15 secondary indicators were selected.[6] They are mobile network coverage, fixed telephone penetration, fixed broadband penetration, secure Internet servers, service exports, ICT service exports, ease of doing business index, ease of starting a business, ICT-related publications, science and technology journal articles, R&D expenditure as a share of GDP, tertiary education workforce, tertiary education enrolment rate, total education expenditure, and mobile Cellular subscriptions, specific metrics are shown below table1.

Table 1. Select metrics and sources

infrastructure	IUI	Individuals using the Internet (% of population)	WDI
	FTS	Fixed telephone subscriptions (per 100 people)	WDI
	FBS	Fixed broadband subscriptions (per 100 people)	WDI
	SIS	Secure Internet servers (per 1 million people)	WDI
trade	ICTse	ICT service exports (% of service exports, BoP)	WDI
	CCe	Communications, computer, etc. (% of service imports, BoP)	WDI
	EoDBS	Ease of Doing Business Score	WB
	EoSBS	Ease of Starting Business Score	WB
E-commerce application capabilities	ICTa	Publication volume of ICT related articles	SJR
	SaTJA	Scientific and technical journal articles	WDI
	R&D	Research and development expenditure (% of GDP)	WDI
	LFwae	Labor force with advanced education (% of total working-age population with advanced education)	WDI
	Set	School enrollment, tertiary (% gross)	WDI
	Geoe	Government expenditure on education, total (% of GDP)	WDI
	Mcs	Mobile cellular subscriptions (per 100 people)	WDI

The index is based on data from the World Bank and the Universal Postal Union, which selected 46 countries for a total of 15 years of data from 2007 to 2021. The descriptive statistics of each indicator data are shown in the following table 2.

Table 2. Descriptive statistics of indicators

	count	mean	sd	min	max
SIS	690	11908.35	29251.75	0.7	277330.58
SaTJA	690	42261.96	88857.11	32.54	669744.3
ICTa	690	16478.17	31561.53	6	267881
ICTse	690	10.02	9.81	0.46	57.75
R&D	690	1.52	1.03	0.08	4.8
FBS	690	24.38	12.71	0.06	48.79

FTS	690	31.38	17.02	0.24	66.35
CCe	690	43.48	15.03	10.87	87.17
EoDBS	690	72.56	8.66	52.52	89.54
Set	690	62.81	24.5	7.51	150.2
Geoe	690	4.77	1.33	1.41	8.56
IUI	690	68.23	24.26	0.49	99
Mcs	690	116.45	22.87	18.84	181.77
LFwae	690	77.89	7.14	42	94.6
EoSBS	690	84.62	11.33	23.72	98.24

3.2 E-commerce development index measurement method

This paper choose 46 countries for 15 years from 2007 to 2021, and selects 15 indicators to build an e-commerce development index. Firstly, the entropy weight method is used to calculate the weights of 15 indicators. Entropy weight method is an objective weighting method, which assigns weights to indicators based on objective data. In addition, entropy weight method has more advantages in the index system with a large number of evaluation indicators and a large time span. Therefore, the entropy weight method is used to determine the evaluation index weight.

Entropy Weight Method (Entropy Weight Method) is a multi-objective decision analysis method, which is based on the concept and principle of information entropy. The method was first proposed by Chinese scholar Tu Shoue in 1980, and has been widely used in management engineering, environmental science, economics and other fields. The basic idea of entropy weight method is to determine the weight of each factor by calculating the information entropy among the factors. In the decision-making process, the greater the information entropy, the more information provided by the factor, the greater the influence on the decision. Therefore, by calculating the information entropy of each factor, its weight can be determined and then used for weight allocation in multi-objective decision making. The steps of the entropy weight method usually include:

Construct a decision matrix: Matrix each factor in the decision problem and its corresponding index. Calculate the information entropy of each factor: for each factor, calculate its information entropy to measure its contribution to the decision.

$$E_i = -\frac{1}{\ln(n)}\sum_{\mathrm{j}=1}^{\mathrm{n}} p_{ij}\ln(p_{ij})$$

Where, p_{ij}represents the probability of j value of the i factor, and n is the number of values of the i factor.

Calculate the weight: according to the information entropy of each factor, calculate its weight, usually use the normalization method to convert the information entropy into the weight. Make a decision: According to the calculated weight, the weight of the decision is allocated to get the final decision result.

$$w_i = \frac{1 - E_i}{n - \sum_{i=1}^{n} E_i}$$

The entropy method is applied to 15 indicators, and the results are as follows table 3:

Table 3. Descriptive statistics of indicators

	Information entropy (e)	Information utility value(d)	w(%)
IUI	0.987	0.013	1.641
FTS	0.973	0.027	3.445
FBS	0.973	0.027	3.481
SIS	0.784	0.216	27.835
ICTse	0.941	0.059	7.599
CCe	0.982	0.018	2.307
EoDBS	0.982	0.018	2.273
EoSBS	0.997	0.003	0.415
SaTJA	0.833	0.167	21.503
R&D	0.958	0.042	5.468
LFwae	0.996	0.004	0.486
Set	0.983	0.017	2.177
ICTa	0.852	0.148	19.034
Geoe	0.987	0.013	1.716
Mcs	0.995	0.005	0.62

Next, the e-commerce development index is calculated according to the results of the entropy weight method for each index ECDI

$$ECDI_i = \sum_{i=1}^{n} w_i X_i$$

Due to the large data magnitude of the index results, logarithmic processing of ECDI was adopted in the empirical study to get lnECDI. The following Figure 1 is a randomly selected index of 7 countries, which can be found that the level of e-commerce development between countries has been increasing in the past 15 years.

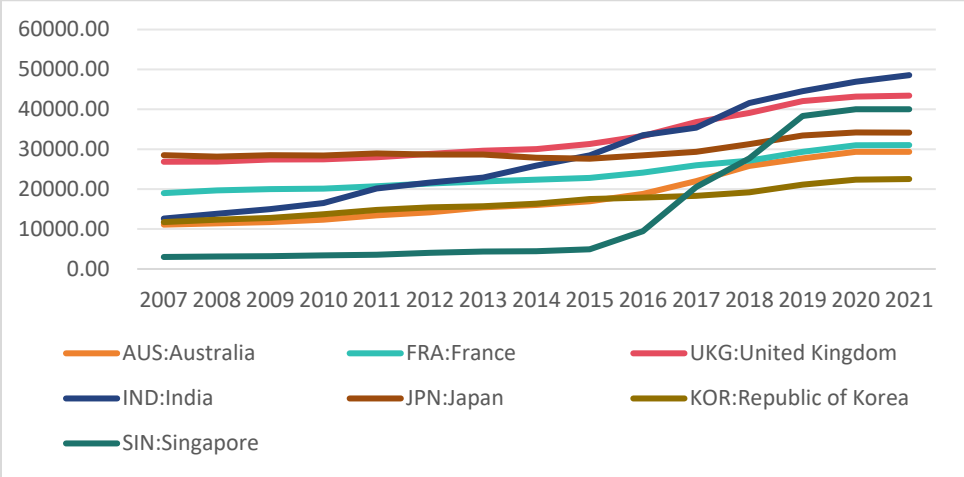

Fig. 1. E-commerce development level

4 An empirical analysis

4.1 Model design

$$GVCpt_{it} = C_0 + \beta_1 lnECDI_{it} + \beta_2 lntIaE_{it} + \beta_3 lnRfts_{it} + \beta_4 lnRfmn_{it} + \mu_{it}$$

$$GVCpos_{it} = C_0 + \beta_1 lnECDI_{it} + \beta_2 lntIaE_{it} + \beta_3 lnRfts_{it} + \beta_4 lnRfmn_{it} + \mu_{it}$$

Where, i represents the country, t represents the year, $\mathrm{GVCpt_{it}}$ is the explained variable, represents the GVC participation degree of the i country t year; $\mathrm{GVCpos_{it}}$ is the explained variable, representing the global value chain position of the i country t year. $\mathrm{lnECDI_{it}}$ as explanatory variable, the e-commerce development index representing the i country t year; $\mathrm{lntIaE_{it}}$ represents the total volume of imports and exports for the i country t year; $\mathrm{lnRfts_{it}}$ represents telecommunications service for the i country t year; $\mathrm{lnRfts_{it}}$ represents ,Mobile network revenue for the i country t year, total of 3 control variables. C_0 is the intercept term, β_1,β_2,β_3,β_4 are regression coefficients of explanatory variables and control variables, μ_{it} is a random disturbance term,which was no correlation with the explanatory variables, and there was no correlation between the explanatory variables.

4.2 Variable selection

4.2.1 Explained variables

Global Value Chain Position Index and Global Value Chain Participation Index. From the perspective of production, a product from the initial research and development design, then to the production of intermediate products, the final assembly is completed, in the various countries or regions involved in the division of labor formed an international division of labor network, from the value creation of products and body entanglement perspective, this is a global value chain[7]. In order to avoid double counting and present the real participation and creation of countries in international trade, the statistical method of using trade added value proposed by Koopman et al. based on national input-output table has been recognized by more and more international organizations and scholars[8]. The data of Global value Chain Position Index and Global Value chain Participation index in this paper are from UIBE GVC database.

4.2.2 Explained variables

E-commerce Development Index. This paper selects mobile network coverage, fixed telephone penetration, fixed broadband penetration, secure Internet servers, service exports, ICT service exports, business environment index, ease of starting a business, ICT-related publications, science and technology journal articles, R&D expenditure as a share of GDP, higher education labor force, higher education enrollment rate, total education expenditure, and more With 15 secondary indicators, the entropy weight method is used to measure the development level of e-commerce in various countries. As the core explanatory variable of this paper, the impact of e-commerce on the global value chain is analyzed.

4.2.3 Control variables

Total imports and exports. The scale of import and export of a country can directly reflect its degree of openness to the outside world, and the degree of openness is one of the important factors that determine the degree of embeddedness and status of a country's global value chain. The higher the degree of openness, the lower the cost of import and export, and the lower the cost of trade with upstream and downstream enterprises of the global value chain, and the more excellent enterprises can be allowed to invest and set up enterprises in the country[9]. The greater the technology spillover effect, the more conducive to improving a country's position in the global value chain. Data from the UN Commodity Trade Statistics Database.

Telecommunications services revenue and mobile network services revenue. Global trade is inseparable from digital platform tools, and telecom service revenue and mobile network service revenue can intuitively reflect the use of a country's citizens to use the Internet and electronic communication, as well as the scale of use. Data from ITU.

4.3 Preliminary Inspection

The table 4 below shows the descriptive statistical results of 46 countries for each variable from 2007 to 2021, with a total of 690 observations for each variable. The standard deviation of each variable is not abnormally larger than the mean value, indicating that there is no abnormal extreme value, which can be further analyzed.

Table 4. Descriptive statistics of indicators

	count	mean	sd	min	max
GVCpt	690	0.42	0.18	0.11	1.05
GVCpos	690	-0.01	0.05	-0.17	0.16
lnECDI	690	8.51	1.81	2.61	12.18
lnRfts	690	22.7	1.76	19.21	27.19
lnRfmn	690	22.03	1.71	18.59	26.35

Next, Hausman test was performed on the data, and the test results were as follows:(Prob > chi2 = 0.0000). According to the test results, the P-value is very small, so the fixed effect model should be chosen.

4.4 Regression analysis of global value chain position index

According to the above results, fixed-effect regression was carried out on the participation degree and position of global value chain respectively, in two ways: without adding control variables and with adding control variables. The regression results are shown in the table 5 below.

Table 5. Fixed effect regression results

	[1] GVCpt	[2] GVCpt	[3] GVCpos	[4] GVCpos	[5] GVCpos
lnECDI	0.017***	0.017***	0.008***	0.008***	0.008***
	(-4.23)	(-4.53)	(-3.92)	(-4.01)	(-3.95)
lnRfts		-0.030**		-0.012***	-0.013*
		(-2.20)		(-2.71)	(-1.84)

lnRfmn		-0.051***			0
		(-3.99)			(-0.05)
lntIaE		0.055***			0.002
		(-3.92)			(-0.26)
_cons	0.089**	0.569	-0.027	0.271**	0.236
	(-2.25)	(-1.61)	(-1.34)	(-2.42)	(-1.35)
N	690	690	690	690	690
R^2	0.9541	0.9601	0.8245	0.8269	0.827
National fixed effects	yes	yes	yes	yes	yes
Year fixed effect	yes	yes	yes	yes	yes

t statistics in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

According to the regression results in the above table, the regression coefficients of the e-commerce development index are all positive and significant under 1%, which indicates that the improvement of the development level of e-commerce will significantly increase the participation degree of countries in the global value chain and improve the status of countries in the global value chain. This is mainly because participating countries can effectively reduce trade costs through the development of e-commerce, including matching costs, marketing costs, financing costs, compliance costs and tracking costs, so that countries locked in the low-end of the global value chain can have more funds to invest in the research and development of products and technology upgrades, and more countries have the opportunity to participate in the global value chain[10]. Secondly, e-commerce makes use of the timely and effective information transmission between participating countries, upstream and downstream enterprises and terminal markets, forcing enterprises to comply with international business rules, promoting product technology innovation and improving international competitiveness[11]. Finally, e-commerce, based on its unique consumer feedback driven chain, realizes the interactive learning effect between producers and end consumers, and small and medium-sized enterprises can gradually upgrade the value chain from five paths through "doing learning"[12]. Ultimately, the goal is to improve the position of participating countries in global value chains.

According to the regression results, R2 keeps increasing after the addition of control variables, indicating that the introduction of control variables increases the degree of fitting. In terms of global value chain participation, the regression coefficient of mobile network service income level and total import and export volume is significant under 1%, indicating that the increase of import and export trade will significantly increase the country's participation in global value chain, while the telecom service income coefficient is negative, possibly because the network cost determines the cost of cross-border trade and other commercial activities of enterprises. The higher the cost, the greater the negative impact on participation in global value chains. Telecom services revenue is significant at 5% and has a negative regression coefficient, similar to mobile network revenue in each country, and costs have a negative impact on GVC participation.

While total import and export volume, telecommunication service income and mobile network income have a significant impact on countries' participation in the global value chain, the change of a country's position in the global value chain is not obvious. The possible reason is that the position in the global value chain is different from the participation level, and the index that can reflect the strength of a country can better reflect its change[13].

4.5 Robustness analysis

In order to ensure the robustness of the results, this paper will observe the impact of the development level of e-commerce on the global value chain through two methods: lag one explanatory variable and change the period of sample size.

4.5.1 Lag one-phase explanatory variables

The one-phase lag explanatory variable is to examine whether the level of e-commerce development in the previous year will have an impact on the position of the global value chain in the next year. The test results are shown in the table 6 below. According to the regression results, the development level of e-commerce after the one-stage lag still significantly affects the position of global value chain and the degree of participation in global value chain at the level of 1%, which is consistent with the conclusion above, which indicates the robustness of the conclusion.

Table 6. Regression results of explanatory variables lag one stage

	[1] GVCpos	[2] GVCpt
L.lnECDI	0.009***	0.015***
	(-3.816)	(-3.738)
lnRfts	-0.008	-0.025*
	(-1.177)	(-1.812)
lnRfmn	0	-0.052***
	0	(-3.801)
lntIaE	-0.004	0.065***
	(-0.509)	(-4.043)
_cons	0.236	0.569
	(-1.353)	(-1.608)
N	690	690
R^2	0.8304	0.9628
National fixed effects	yes	yes
Year fixed effect	yes	yes

t statistics in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

4.5.2 Change the period of sample size

In order to test whether the conclusion is universal, this paper selects a New Year interval and selects the data from 2012 to 2021 to conduct a fixed effect analysis again. The analysis results are shown in the following table 7. According to the regression results, after changing the data cycle, the development level of e-commerce in each country still significantly affects the status of global value chain and the degree of participation in global value chain at the level of 1%, which is consistent with the conclusion above, which indicates the robustness of the conclusion.

Table 7. Change the sample size after the cycle of regression results

	[1] GVCpos	[2] GVCpt
lnECDI	0.011***	0.014***
	(-4.744)	(-3.278)

lnRfts	0.003	0.013
	(-0.469)	(-0.801)
lnRfmn	-0.002	-0.032**
	(-0.296)	(-1.990)
lntIaE	-0.012	0.079***
	(-1.044)	(-3.379)
_cons	0.211	-1.540**
	(-0.638)	(-2.450)
N	690	690
R^2	0.849	0.9731
National fixed effects	yes	yes
Year fixed effect	yes	yes

t statistics in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

5 Mechanism analysis

Next, this paper will study how different levels of e-commerce in countries around the world affect the path of global value chain. Judging from common sense, the status of a country's global value chain should be related to the degree of participation in global value chain, and the development level of e-commerce in countries will affect the degree of participation in global value chain. Then, the development level of e-commerce - participation degree of global value chain - position chain of global value chain is formed. Next, the participation degree of global value chain is taken as the intermediary variable and verified by the method of stepby-step regression. The verification results are shown in the following table 8. According to the test results, it can be analyzed that the level of e-commerce development significantly affects the position of global value chain and the degree of participation in global value chain at the 1% level. After the participation degree of global value chain is introduced as the intermediary variable, the position of global value chain is taken as the explained variable, and the participation degree of global value chain is taken as the explanatory variable. The participation level of global value chain is still significantly positive at 1% level, and the regression coefficient of e-commerce development level decreases from 0.008 to 0.006, indicating that the development level of e-commerce affects the status of countries in the global value chain by influencing the degree of a country's participation in the global value chain. And the higher the level of e-commerce development, the higher the participation, the higher the position of the global value chain.

Table 8. The mechanism checks the regression results

	[1] GVCpos	[2] GVCpt	[3] GVCpos
GVCpt			0.124***
			(-4.035)
lnECDI	0.008***	0.017***	0.006***
	(-3.945)	(-4.529)	(-2.852)
lnRfts	-0.013*	-0.030**	-0.009
	(-1.843)	(-2.202)	(-1.370)
lnRfmn	0	-0.051***	0.007
	(-0.049)	(-3.994)	(-1.186)

lntIaE	0.002	0.055***	-0.005
	(-0.261)	(-3.924)	(-0.719)
_cons	0.236	0.569	0.165
	(-1.353)	(-1.608)	(-0.841)
N	690	690	690
R^2	0.827	0.9601	0.8365
National fixed effects	yes	yes	yes
Year fixed effect	yes	yes	yes

t statistics in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

6 Conclusions and policies

6.1 Research Conclusions

In recent years, "Global value chain" has become a hot topic of research by international organizations and scholars. Based on previous studies, this paper studies the influence mechanism of the improvement of e-commerce development level on the participation degree and status change of countries in global value chain. From an empirical perspective, using data from the World Bank and the Universal Postal Union, After measuring the e-commerce development index, global value chain position index and participation index of 46 countries from 2007 to 2021, and conducting regression analysis, the following conclusions are drawn and policy recommendations are given based on the conclusions.

First, according to the calculation results of the e-commerce Development Index, the sound Internet infrastructure, high national quality and convenient trade conditions have made the development level of e-commerce higher, and the level of e-commerce in all countries is constantly rising.

Second, according to the calculation results of the GVC position index and participation index, it is found that the improvement of e-commerce level will significantly increase the degree of participation in global value chain and promote the status of global value chain. This is mainly due to the development of e-commerce has reduced trade costs and reduced the "threshold" of global value chain embedment. Enterprises that could not participate in the global production division due to high trade costs have been embedded in the global production chain through e-commerce platforms, thus the development of e-commerce has promoted the embedment of value chain.

6.2 Policy Recommendations

According to theoretical analysis and empirical conclusions, e-commerce can promote the status of participating countries in the global value chain, and the development of e-commerce can also help countries to enhance their participation in the global value chain. Therefore, this paper suggests that all countries should vigorously develop e-commerce. From the Internet infrastructure, related personnel training, improve laws and regulations, encourage foreign investment and other aspects to improve the level of e-commerce development, in order to solve the global value chain low-end lock-in problem, actively participate in the international division of labor, deepen economic globalization. Specific suggestions are as follows.

One of the key prerequisites for improving the level of e-commerce development is the establishment of a sound infrastructure, which includes both physical and digital infrastructure. Physical infrastructure is the popularization of broadband, intelligent terminals and computers, and digital infrastructure is the construction of big data, Internet of Things, cloud computing, artificial intelligence and other fields. Governments can adopt strategies, policy incentives, subsidies and other ways to encourage domestic enterprises or attract foreign direct investment to improve infrastructure. Digital human capital investment[14].

Another important reason for the low level of e-commerce development is the lack of digital talents. The government can use incentive policies to encourage young people to devote themselves to digital technology, strengthen investment in digital human capital, popularize computer-related knowledge in basic education, establish key digital technology talent incubation bases in higher education schools, and focus on cultivating high-end artificial intelligence professionals.

In addition, countries need to focus on developing digital skills and advanced cognitive skills, such as information processing and problem solving, to provide learning opportunities and re-employment opportunities for marginalized groups, represented by the unemployed. Improve e-commerce laws and regulations to regulate business behavior, consumer protection and data privacy protection, and promote the healthy development of e-commerce industry. A strong legal framework for consumer protection can foster consumer confidence and enhance their trust in digital marketplaces and online transactions, thus making it easier for them to participate in e-commerce processes.

Encourage foreign investment in e-commerce, and promote healthy competition and healthy development of domestic e-commerce through technology spillover effect and industrial cluster effect. Some low - and middle-income countries may lack the vitality of e-commerce industry due to the weak strength of domestic enterprises or over-protection of domestic enterprises, so that e-commerce can not get better development. At this time, it is necessary to attract foreign direct investment to inject new impetus into the development of e-commerce, and promote the development of domestic e-commerce through technology spillover effect and industrial agglomeration effect[15].

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