



# A Study on the Influence of Digital Service Trade Barriers on the Dual Margin of Service Exports

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**Abstract.** This paper uses the service exports of 34 countries from 2014 to 2021 to calculate the dual margin of service exports, introduces DSTRI index and uses Poisson pseudo-maximum likelihood measurement method to conduct benchmark regression on the impact of digital service trade barriers on the dual margin of service exports, and tests the mediating effect of trade costs. The results show that digital service trade barriers have a restraining effect on the dual margin of service exports; The digital service trade barriers increase the variable trade cost of exporting enterprises, and then inhibit the expansion of the intensive margin of service exports. The digital service trade barriers increase the fixed trade cost and variable trade cost of exporting enterprises, and then restrain the expansion of the extensive margin of service exports. The extensive margin of service exports is more constrained than intensive margin by digital service trade barriers.

**Keywords:** service export; dual margin; digital service trade barriers

## 1 Introduction

The digital economy has brought new opportunities for the development of global service trade. Through enabling the whole process of service trade such as negotiation, signing and foreign exchange payments, the application of digitalization makes the trade between countries further break through the restrictions in time and space, reduces fixed and variable trade costs, improves the trade efficiency, and then achieves the further expansion of trade scales. Therefore, while the traditional service trade is relatively mature, the digital service trade is becoming a new frontier of the game between great powers. At the same time, the construction of digital service trade barriers has become an important measure for countries to weaken the impact of service exports of other countries on the development of their domestic digital industries. What is the impact of this measure on service exports? It is of great significance to discuss the impact of digital service trade barriers on service exports based on a dual margin perspective in this paper.

## 2 Literature Review

At present, scholars have conducted a variety of researches on the digital service trade barriers and the dual margin of exports respectively. Among them, the researches on the dual margin of exports mainly focus on the definition (such as Hummels & Klenow(2002)[1]; Chen Yongbing and Chen yumei(2011)[2]) and measurement(AmuIgo-Pacheco & Pierola(2008)[3]; Liu Zhizhong & Chen Qianying(2022)[4]). Some scholars also discussed the influence mechanism of different factors on the dual margin from the aspects of trade costs, trade policies and trade agreements, etc. For example, Kanacs(2007)[5] analyzed the effect of variable costs and fixed costs on the dual margin of exports of southeast European countries, and Chen Yongbing et al.(2012)[6] found that these costs have opposite effects on the dual margin of exports of enterprises; Lawless's research(2010)[7] shows that both the import complexity and the country distance have significant negative effects on the dual margin of exports; The results by Wei Youyue and Liu Hongduo(2017)[8] show that the uncertainty of China's economic policies has no significant effects on the intensive margin of exports, but has a significant inhibiting effect on the extensive margin of exports; The results by Lin Xi and Bao Xiaohua(2019)[9] show that the services RTAs has a significant promotion effect on the dual margin of service exports, and the promotion effect of intensive margin is slightly greater than that of extensive margin; Hou Junjun et al. (2024)[10] found that bilateral free trade agreements significantly inhibited the growth of China's extensive margin of exports and promoted the growth of the intensive margin of exports; The research results by Han Huixia and Jin Zehu(2023)[11] show that the increase of policy uncertainty in trading partners will significantly restrain the dual margin of China's service exports, and the inhibiting effect on the intensive margin is greater; Herman and Oliver(2023) [12] evaluated the impact of digital trade policies and Internet connectivity on trade, and found that the use of the Internet has a significantly positive effect on the intensive margin and extensive margin of exports.

In addition to the definition (such as Ferencz(2019)<sup>[13]</sup>)and the measurement(such as Wang Lan(2021)<sup>[14]</sup>) of digital service trade barriers, some scholars also conduct researches about the impact of service trade barriers on trades. For example, Ferencz(2019)<sup>[15]</sup> conducted researches based on DSTRI index and found that digital service trade barriers have a significant inhibiting effect on digital service trades; Van and Ferracane(2021) <sup>[16]</sup> used the DTRI index to investigate the impact of digital barriers on service trade and found that trading partners sharing the open model for cross-border transfers of data exhibit higher levels of digital service trade; Zhou Nianli and Yao Tingting(2021)<sup>[17]</sup> found that the restrictive measures on the free flow of cross-border data have a significant inhibiting effect on the improvement of the export technology complexity of service sectors; Qi Junyan and Qiang Huajun(2021)<sup>[18]</sup> found that digital service trade barriers can significantly inhibit the improvement of export complexity of service industries through technological innovation; Zhang Guofeng et al.(2022)<sup>[19]</sup> studied the impact of digital service trade barriers on the exports of manufacturing industries based on DSTRI index, and found that digital service trade barriers would inhibit the improvement of the export product quality through both intensive margin and extensive margin, and tested the effects of the trade cost effect and

intermediate input effect. Fang Yong (2022)<sup>[20]</sup> used qualitative analysis method to explore the impact of digital service trade barriers on the extensive margin of exports, and found that the impact of digital service trade barriers on the extensive margin of exports is mainly caused by changing trade costs.

In general, the amount of literatures that explore the impact of digital service trade barriers on service exports focusing on the marginal source of growth is relatively limited. Therefore, this paper introduces a dual margin perspective to test the impact of digital service trade barriers on the intensive margin and extensive margin of service exports respectively, so as to provide a more specific and comprehensive reference for the proposal of corresponding policy guidelines.

### 3 Model Settings and Variables Description

#### 3.1 Model Settings

This paper applies Chaney's (2008)[21] heterogeneous enterprise model framework to the field of trade in services, and draws on the research methods of Qian Xuefeng, Xiong Ping(2010)[22], Lin Xi and Bao Xiaohua(2019)[9] to introduce the impact of digital service trade barriers into the framework of trade gravity model, and builds the measurement model of trade gravity as follows:

$$\ln IM_{ijpt} = \alpha_0 + \alpha_1 DSTRI_{ijt} + \alpha_2 X + \lambda_i + \lambda_j + \lambda_p + \lambda_t + \mu_{ijpt} \quad (1)$$

$$\ln EM_{ijpt} = \beta_0 + \beta_1 DSTRI_{ijt} + \beta_2 Z + \lambda_i + \lambda_j + \lambda_p + \lambda_t + \varepsilon_{ijpt} \quad (2)$$

Formula (1) is the equation of the impact of digital service trade barriers on the intensive margin of service exports, and formula (2) is the equation of the impact of digital service trade barriers on the extensive margin of service exports. In the equations,  $i$  represents the exporting country,  $j$  represents the importing country,  $p$  represents the industry,  $t$  represents the year,  $\ln IM_{ijpt}$  refers to the intensive margin of exports of country  $i$  to the  $p$  service industry of country  $j$  in year  $t$ ,  $\ln EM_{ijpt}$  refers to the extensive margin of exports of country  $i$  to the  $p$  service industry of country  $j$  in year  $t$ .  $DSTRI_{ijt}$  represents the degree of restriction of the bilateral digital service trade between country  $i$  and country  $j$ .  $X$  and  $Z$  represent the set of control variables,  $\lambda_i$ ,  $\lambda_j$ ,  $\lambda_p$ ,  $\lambda_t$  respectively represent the fixed effect of exporting country, the fixed effect of importing country, the fixed effect of industry and the fixed effect of time, and  $\mu_{ijpt}$ ,  $\varepsilon_{ijpt}$  represent the random disturbance items.

#### 3.2 Variables Description

(1) Dependent variables: The dependent variables are the intensive margin and the extensive margin of bilateral trade service exports. The methods of Amurgo-Pacheco & Pierola(2008)<sup>[3]</sup> and Qian Xuefeng & Xiong Ping(2010)<sup>[22]</sup> are used for reference to define the dual margin of service exports. The intensive margin of service exports is defined as follows: Taking 2014 as the base period, if country  $i$  exports the products in

service industry  $p$  to country  $j$  in 2014, and country  $i$  still exports the products in service industry  $p$  to country  $j$  in 2021, then whether country  $i$  exports the products in service industry  $p$  to Country  $j$  during 2014-2021 will be examined in turn. If the export value is not zero, then the export value of the service industry  $p$  is the intensive margin of service exports, otherwise  $IM_{ijpt}$  would be zero. The extensive margin of service exports is defined as follows: Taking 2014 as the base period, if country  $i$  does not export the products of service industry  $p$  to country  $j$  in the end of 2014, but the export value of service industry  $p$  products of country  $i$  to country  $j$  in 2021 is no longer zero, then whether country  $i$  exports the products of service industry  $p$  to country  $j$  during 2014-2021 will be examined in turn. If the export value is not zero, then the export value of service industry  $p$  is the extensive margin of service exports, otherwise  $EM_{ijpt}$  would be zero. Due to the problem of zero data loss, this paper refers to the method of Qian Xuefeng & Xiong Ping(2010)<sup>[22]</sup> to respectively substitute the dual margin of service exports in the form of  $\ln IM_{ijpt} = \ln(1 + IM_{ijpt})$  and  $\ln EM_{ijpt} = \ln(1 + EM_{ijpt})$  into the regression equation. Empirical data are derived from the service exports of bilateral trade between 34 sample countries in the world from 2014 to 2021 in the Batis database, and the service industry is defined as 12 first-level subdivided service industries according to the EBOPS2010 statistical framework.

(2) The main independent variable: It is the digital service trade restriction index  $DSTRI_{ijt}$ , whose data comes from the digital service trade restriction index of 34 sample countries during 2014-2021 released by OECD. The closer the numerical value is to 1, the higher the degree of trade restriction is, and the closer it is to 0, the lower the degree of trade restriction is. Since both the importing country and the exporting country's digital service trade barriers in bilateral service trade may have an impact on the dual margin of the export growth, this paper defines  $DSTRI_{ijt} = DSTRI_{it} \times DSTRI_{jt} \times 100\%$  by referring to the methods of Zhou Nianli et al.(2022)<sup>[23]</sup>.

(3) Control variables: 1) The bilateral economic scale( $\ln GDP_{it}$  and  $\ln GDP_{jt}$ ), it is calculated from the GDP of 34 sample countries based on 2015 constant US dollars and the data is derived from the WDI database. 2) The Importing country's distance index( $\ln \theta_{jt}$ ), the methods of Kancs(2007)<sup>[5]</sup> is adopted to define  $\theta_{jt} = \sum_{i=1}^N (\frac{Y_i}{Y_w}) \sqrt{E_{ij}E_{ji}/E_{ii}E_{jj}}$ , where  $Y_i$  represents the economic scale of country  $i$ ,  $Y_w$  represents the sum of the economic scale of all other countries except country  $j$ ,  $E_{ij}$  and  $E_{ji}$  respectively represent the service export value of country  $i$  to country  $j$  and the service export value of country  $j$  to country  $i$ ,  $E_{ii}$  and  $E_{jj}$  represent the domestic service trade value of countries  $i$  and  $j$  respectively. The data of economic scale is from the WDI database and the data of service export value is from the Batis database. 3) Fixed trade costs ( $f_{ij}$ ), considering that when service enterprises export differentiated service products abroad, they need to pay fixed trade costs first to establish overseas distribution channels, learn and improve service standards to meet foreign regulations and regulatory requirements, and these fixed trade costs are affected by economic, political, cultural and other factors. Therefore, the logarithm of the ratio of the economic liberalization index of the importing country to the economic liberalization index of the exporting country ( $\ln Free_{ij}$ ) is selected in this paper. The higher the numerical value of

the economic liberalization index, the higher the level of economic freedom of the country. The data is deprived from The Heritage Foundation website. 4) Other control variables reflecting the political and cultural relations between the two countries are introduced. *contig<sub>ij</sub>* indicates whether the two countries are adjacent, *colony<sub>ij</sub>* indicates whether the two countries have ever been colonial, and *smctry<sub>ijt</sub>* indicates whether the two countries have ever belonged to the same country or region, with 1 being yes and 0 being no. The data are derived from CEPII database. 5) In terms of variable trade cost( $\tau_{ij}$ ), *dist<sub>ij</sub>* is mainly introduced to indicate the distance between the capitals of two countries, reflecting the difference in the transportation cost of employees brought by the distance between countries; *comlang<sub>ij</sub>* is introduced to indicate whether two countries use the same language, reflecting the communication cost of service enterprises' trades between countries; *currency<sub>ijt</sub>* is introduced to indicate whether two countries use the same official currency, reflecting the exchange costs between the two countries. The above data are from the CEPII database.

(4) Mediator: In order to test the influence mechanism of digital service trade barriers on the dual margin of service exports, the service trade cost is selected as a mediator. Referring to Novy's trade cost calculation model (2013)[24], the expression of bilateral service trade cost is as follows:

$$Cost_{ijt} = \left( \frac{x_{ii}x_{jj}}{x_{ij}x_{ji}} \right)^{1/2(\sigma-1)} - 1 \tag{3}$$

$x_{ij}$  represents the export value of service trade from country  $i$  to country  $j$ ,  $x_{ii}$  and  $x_{jj}$  respectively represent the value of domestic service trade of the exporting country and the importing country,  $x_{ji}$  represents the export value of service trade from country  $j$  to country  $i$ , and  $\sigma$  represents the elasticity of commodity substitution. Using Novy's(2013)[24] method as reference,  $\sigma$  is set to 8, and the tradeable share of total economic output is assumed to be 80%. Then, the statistical values of economic output and bilateral service trade exports of each sample country in WPI database and BATIS database are used to deduce the domestic service trade value backwards. As show in table 1.

**Table 1.** Variables' Descriptive Statistics

Variable	Value	Mean Value	Standard Deviation	Minimum Value	Maximum Value
<i>lnIM<sub>ijpt</sub></i>	107712	2.961	2.239	0.000	10.943
<i>lnEM<sub>ijpt</sub></i>	107712	0.006	0.129	0.000	9.780
<i>DSTR<sub>ijt</sub></i>	107712	0.024	0.022	0.000	0.154
<i>Cost<sub>ijt</sub></i>	107712	1.706	0.575	0.352	4.373
<i>ln<math>\theta_{jt}</math></i>	107712	0.004	0.005	0.001	0.031
<i>lnGDP<sub>it</sub></i>	107712	27.389	1.268	24.796	30.653
<i>lnGDP<sub>jt</sub></i>	107712	27.388	1.266	24.796	30.653
<i>lnFree<sub>ij</sub></i>	107712	4.235	0.123	3.924	4.436
<i>ln<math>dist_{ij}</math></i>	107712	8.475	1.075	5.153	9.892
<i>contig<sub>ij</sub></i>	107712	0.053	0.223	0.000	1.000
<i>comlang<sub>ij</sub></i>	107712	0.115	0.319	0.000	1.000

<i>colony<sub>ij</sub></i>	107712	0.041	0.198	0.000	1.000
<i>currency<sub>ijt</sub></i>	107712	0.100	0.300	0.000	1.000
<i>smctry<sub>ijt</sub></i>	107712	0.010	0.099	0.000	1.000

## 4 Empirical Results

### 4.1 Benchmark Regression

It can be seen from columns (1) and (2) of Sheet 2 that the estimated coefficient of digital service trade barriers to the intensive margin of service exports is significantly negative at the 1% level. After the control variables of the trade gravity model are added, the sign and significance of the estimated coefficient do not change, which indicates that digital service trade barriers significantly inhibit the growth of the intensive margin of service exports. According to columns (3) and (4), the impact of digital service trade barriers on the extensive margin of service exports is significantly negative at the level of 1%. Compared with columns (2) and (4) in the table, every time digital service trade barriers increase by 1 unit, the intensive margin of service exports decreases by 1.029, and the extensive margin of service exports decreases significantly by 25.527. It can be seen that the negative impact of digital service trade barriers on the extensive margin of service exports is greater than that of the intensive margin. This is mainly because the enhancement of digital service trade barriers will lead to the increase of bilateral service trade costs, thus inhibiting the growth of the dual margin of service exports, in which the intensive margin is mainly affected by the change of variable service trade costs, and the extensive margin is affected by the double impacts of the change of fixed service trade costs and variable service trade costs.

The coefficient sign and significance results of the control variables in Table 2 are also in good agreement with the trade gravity model. First, the economic scales of importing country and exporting country will have a significant positive impact on the intensive margin and extensive margin of service exports. The economic scales of the importing country reflect the consumer market scales and the consumption abilities of residents in the country, while the economic scales of the exporting country reflect the type and quantity of products that the country can export. Second, the distance index of the importing country has a significant positive impact on the intensive margin of service exports, because the "trade diversion" effect brought by the rising trade costs with other countries makes the intensive margin scale of the bilateral trade expands. Third, the common official language and official currency have a significant positive impact on the intensive margin of service exports, while the capital distance between countries has a significant negative impact on the intensive margin of service exports, because the reduction of variable trade costs such as communication costs, exchange costs and transportation costs will significantly promote the growth of the intensive margin of service exports. Fourth, whether the two countries are adjacent and whether the two countries have had colonial relations will have a significant impact on the extensive margin of service exports, because the political and economic relations between the

importing country and the exporting country will affect the extensive margin through fixed trade costs.

## 4.2 Robustness Test

In this paper, the evaluation index of digital service trade barriers is replaced with service policy openness index ( $SPO_{ijt}$ ) by referring to the method of Jin Zehu and Shi

**Table 2.** The Results of the Benchmark Regression

	(1)	(2)	(3)	(4)
	lnIM	lnIM	lnEM	lnEM
$DSTRI_{ijt}$	-7.642*** (-57.861)	-2.698*** (-26.406)	-23.565*** (-4.305)	-25.525*** (-5.404)
$lnGDP_{jt}$		0.211*** (197.322)		-1.378 (-0.879)
$ln\theta_{jt}$		12.041*** (36.874)		-10.343 (-0.261)
$ln\text{dist}_{ij}$		-0.196*** (-113.101)		0.732*** (6.623)
$comlang_{ij}$		0.096*** (21.720)		-0.736*** (-2.622)
$currency_{ijt}$		0.079*** (15.774)		-0.596* (-1.843)
$lnGDP_{it}$				0.187*** (3.775)
$lnFree_{ij}$				-1.147 (-0.275)
$colony_{ij}$				-3.368*** (-7.279)
$smctry_{ijt}$				0.000 (.)
$contig_{ij}$				2.386*** (4.938)
_cons	1.392*** (436.470)	-2.963*** (-96.380)	-2.554*** (-20.033)	28.882 (0.696)
fixed effect of year	Yes	Yes	Yes	Yes
fixed effect of country	Yes	Yes	Yes	Yes
fixed effect of industry	Yes	Yes	Yes	Yes
Pseudo R2	0.1961	0.2643	0.2832	0.3286
N	107712	107712	69216	68292

Note: \*, \*\*, and \*\*\* indicate that the coefficient estimates are significant at the 10%, 5%, and 1% levels respectively

$Le(2020)^{[25]}$ , and  $SPO_{ijt}=100*(1-DSTRI_{it})*(1-DSTRI_{jt})$ . The closer the value of this index is to 100, the lower the degree of digital service trade restrictions. According

to the regression results of columns (2) and (4) in Table 3, the impact of SPO index on the intensive margin and extensive margin of service exports is significantly positive at the level of 1%, and the estimated coefficients are 0.015 and 0.055 respectively. It can be seen that the impact on the extensive margin of service export is greater than the intensive margin. It can be seen that digital service trade barriers have a significant negative impact on the dual margin of service exports, and the conclusion of benchmark regression has strong robustness.

**Table 3.** The Regression Results after Replacing the Main Independent Variable

	(1)	(2)	(3)	(4)
	lnIM	lnIM	lnEM	lnEM
<i>SPO<sub>ijt</sub></i>	0.020*** (81.536)	0.015*** (56.836)	0.051*** (4.698)	0.055*** (5.607)
<i>lnGDP<sub>jt</sub></i>		0.378*** (9.706)		-1.415 (-0.902)
<i>lnθ<sub>jt</sub></i>		-1.804 (-0.942)		-10.384 (-0.262)
<i>ln<sub>dist<sub>ij</sub></sub></i>		-0.190*** (-99.571)		0.743*** (7.158)
<i>comlang<sub>ij</sub></i>		0.162*** (31.077)		-0.793*** (-2.709)
<i>currency<sub>ijt</sub></i>		0.085*** (15.604)		-0.467 (-1.500)
<i>lnGDP<sub>it</sub></i>				0.196*** (3.777)
<i>lnFree<sub>ij</sub></i>				-0.807 (-0.192)
<i>colony<sub>ij</sub></i>				-3.364*** (-7.269)
<i>smctry<sub>ijt</sub></i>				0.000 (.)
<i>contig<sub>ij</sub></i>				2.061*** (4.540)
_cons	-0.264*** (-14.362)	-8.757*** (-8.119)	-6.749*** (-8.474)	23.621 (0.571)
fixed effect of year	Yes	Yes	Yes	Yes
fixed effect of country	Yes	Yes	Yes	Yes
fixed effect of industry	Yes	Yes	Yes	Yes
Pseudo R2	0.1741	0.2008	0.2860	0.3310
N	107712	107712	69216	68292

Note: \*, \*\*, and \*\*\* indicate that the coefficient estimates are significant at the 10%, 5%, and 1% levels respectively



### 4.3 Endogenous Processing

Considering the possible endogenous problem in this study, that is, the possible two-way causal relationship between digital service trade barriers and the intensive margin and extensive of service exports, this paper refers to the method of Tang Yihong and Zhang Pengyang(2020)<sup>[26]</sup>, and selects the main variable with a lag of one stage as the instrumental variable, expressed by  $DSTRI_{ijt-1}$ . As can be seen from Table 4, when the variables lag one stage, the negative impact of digital service trade barriers on the dual margin of service exports is still significant at the level of 1%, and the research conclusion is robust and reliable.

**Table 4.** The Regression Result of The Main Independent Variable Lagging One Stage

	(1) lnIM	(2) lnIM	(3) lnEM	(4) lnEM
$DSTRI_{ijt-1}$	-7.514*** (-56.969)	-2.596*** (-25.315)	-25.541*** (-4.500)	-27.439*** (-5.487)
$lnGDP_{jt}$		0.211*** (197.341)		-1.179 (-0.754)
$ln\theta_{jt}$		12.148*** (37.214)		-9.774 (-0.247)
$lndist_{ij}$		-0.196*** (-113.127)		0.735*** (6.690)
$comlang_{ij}$		0.096*** (21.794)		-0.734*** (-2.614)
$currency_{ijt}$		0.079*** (15.761)		-0.588* (-1.822)
$lnGDP_{it}$				0.185*** (3.711)
$lnFree_{ij}$				-0.716 (-0.173)
$colony_{ij}$				-3.367*** (-7.275)
$smctry_{ijt}$				0.000 (.)
$contig_{ij}$				2.375*** (4.947)
_cons	1.389*** (436.122)	-2.970*** (-96.534)	-2.530*** (-19.817)	21.594 (0.520)
fixed effect of year	Yes	Yes	Yes	Yes
fixed effect of country	Yes	Yes	Yes	Yes
fixed effect of industry	Yes	Yes	Yes	Yes
Pseudo R2	0.1959	0.2642	0.2840	0.3292
N	107712	107712	69216	68292

Note: \*, \*\*, and \*\*\* indicate that the coefficient estimates are significant at the 10%, 5%, and 1% levels respectively

#### 4.4 Mediating Effect Test

With reference to Wen Zhonglin and Ye Baojuan's(2014)[27] method, the mediating effect of trade costs is further verified. It can be seen from Table 5 and Table 6 that digital service trade barriers have a significant negative impact on the trade cost of service exports, and both digital service trade barriers and trade costs have a significant inhibitory effect on the intensive margin and extensive margin of service exports. Therefore, it can be seen that trade costs have a partial mediating effect between digital service trade barriers and the dual margin of service exports.

**Table 5.** Test results of the mediating effect of trade cost between digital service trade barriers and intensive margins

	(1) lnIM	(2) lnIM	(3) $Cost_{ijt}$
$DSTRI_{ijt}$	-2.698*** (-26.406)	-0.827*** (-8.390)	1.232*** (45.624)
$Cost_{ijt}$		-0.578*** (-95.339)	
_cons	-2.963*** (-96.380)	-1.907*** (-60.110)	0.274*** (24.417)
control variables	Yes	Yes	Yes
fixed effect of year	Yes	Yes	Yes
fixed effect of country	Yes	Yes	Yes
fixed effect of industry	Yes	Yes	Yes
Pseudo R2	0.2643	0.2766	0.0611
N	107712	105504	105504

Note: \*, \*\*, and \*\*\* indicate that the coefficient estimates are significant at the 10%, 5%, and 1% levels respectively

## 5 Conclusions and Suggestions

This paper finds that: (1) Digital service trade barriers have a significant inhibitory effect on the growth of the dual margin of service exports, and the extent of the inhibitory effect on the extensive margin is greater than that of the intensive margin; (2) Digital service trade barriers will lead to the increase of variable trade costs of service exporting enterprises, which will increase the productivity critical value of obtaining export profits. Some enterprises with low productivity choose to withdraw or reduce the scale of product export, and the intensive margin of service exports will decline. The digital service trade barriers also increase the fixed trade cost of enterprises, the change of variable trade cost and fixed trade cost jointly affects the productivity critical value of exports, making some enterprises with low productivity choose not to enter the export

market, and the extensive margin of service exports decreases. Based on the above conclusions, this paper puts forward the following suggestions.

**Table 6.** Test results of the mediating effect of trade cost between digital service trade barriers and extensive margins

	(1) lnEM	(2) lnEM	(3) $Cost_{ijt}$
$DSTRI_{ijt}$	-25.525*** (-5.404)	-23.316*** (-4.521)	2.881*** (97.734)
$Cost_{ijt}$		-0.376** (-2.037)	
_cons	28.882 (0.696)	36.710 (0.884)	5.935*** (17.866)
control variables	Yes	Yes	Yes
fixed effect of year	Yes	Yes	Yes
fixed effect of country	Yes	Yes	Yes
fixed effect of industry	Yes	Yes	Yes
Pseudo R2	0.3286	0.3332	0.0555
N	68292	65604	105504

Note: \*, \*\*, and \*\*\* indicate that the coefficient estimates are significant at the 10%, 5%, and 1% levels respectively

(1) Greater openness to digital service trade. On the one hand, for partner countries that have established trade cooperation in various service industries, digital infrastructure can be strengthened, restrictions on cross-border data flow of enterprises can be relaxed, allow enterprises to use electronic means to make payments and receipts, and policy pressure on enterprises to carry out cross-border business activities can be reduced, thus helping to increase the intensive margin of service exports. On the other hand, for countries that have not yet established trade relations in the service industries, they should strengthen the protection of intellectual property rights while reducing restrictions on digital service trade in terms of data connectivity, electronic transactions, payment systems and other obstacles, so as to help the extensive margin of service exports grow.

(2) Reduce the cost of export trade of service enterprises. The first is to provide export trade subsidies, export trade tax incentives or export procedure fee reduction to service export enterprises, improve the efficiency of enterprises' cross-border service export declaration process through the "single window" and other forms, and reduce the hidden fees that service export trade needs to pay by standardizing the charging system or enhancing the transparency of the charging process; The second is to urge financial institutions to reduce the financing cost of the export trade of service enterprises, and provide the support of government industrial funds for service export enterprises; The third is to reduce the energy cost of service export enterprises through energy supply guarantee and energy price mechanism; The fourth is to improve the supporting construction of industrial parks, reduce the cost of service export enterprises; The fifth is to actively carry out business negotiations with other countries to strive for

bilateral trade reciprocity policy, and join multilateral trade cooperation organizations to obtain trade reciprocity with many countries.

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