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The Impact of Anti-Dumping Measures on the Export of Intermediate Goods in Chinese Manufacturing Industry - Based on the perspective of ownership of importing firms

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Abstract

This paper links the OECD-ICIOMNE database with the OECD analytical AMNE database. Based on the ownership of importing countries' enterprises, it dissects the scale of intermediate product exports in the Chinese manufacturing industry. Furthermore, it combines this analysis with the Temporary Trade Barriers Database to explore the heterogeneous effects of anti-dumping measures on the scale of intermediate product exports. The study finds that: (1) The scale of intermediate product exports from the Chinese manufacturing industry to domestically owned enterprises in importing countries is higher than that to the third-country multinational corporations within the importing country, with the lowest scale observed for exports to Chinese multinational corporations located within importing countries' borders. (2) Under the impact of anti-dumping measures, the negative effect on the scale of intermediate product exports to domestically owned enterprises in importing country is greater than that on exports to the third-country multinational corporations within the importing country. However, exports to Chinese multinational corporations within importing countries' borders don't experience a significant impact. (3) The endowment of factors in Chinese manufacturing industries and the regions to which importing countries belong will lead to heterogeneous impacts on the relationship between anti-dumping measures and the scale of intermediate product exports.

Keywords: Scale of Intermediate Product Export, Importing Country, Domestically Owned Enterprise, Chinese Multinational Corporation, Third-country Multinational Corporation.

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1. Introduction

Amidst the current unprecedented global upheaval, characterized by accelerated evolution, the interplay between major power rivalry and populism, and the resonance of geopolitical conflicts with anti-globalization sentiments, the international landscape is becoming increasingly complex and perilous. This has led to a surge in trade friction risks, disrupting the diverse and stable international economic and political order and severely hindering the deepening collaboration in global industrial division of labor. Anti-dumping measures, given their formal legitimacy, strong targeting, arbitrariness, and ease of implementation (Wang et al., 2015), have emerged as a typical form of trade friction. According to statistics from the China Trade Remedy Information Network, anti-dumping cases accounted for 83.61% of the total global trade remedy cases from 1995 to 2024. Among them, there were a total of 1,727 anti-dumping cases initiated against China, comprising 26.8% of the total global anti-dumping cases. The implementation of anti-dumping policies against China by foreign countries has significantly deteriorated the export environment for Chinese enterprises, markedly reduced the willingness of enterprises in importing countries to engage in economic and trade cooperation, and caused significant impacts on the export scale of intermediate products from Chinese enterprises.

The deepening development of economic globalization has blurred traditional boundaries between nations, providing maximal facilitation for the free flow of capital, labor, and products across the globe. Against this backdrop, the globalization strategies of Chinese multinational corporations (MNCs) and the cross-border export behaviors of intermediate products have been vigorously promoted. On the one hand, this trend has encouraged market entities within importing countries to transcend national and ethnic limitations, moving towards a direction where domestically owned enterprises (DOEs), Chinese multinational corporations, and the third-country multinational corporations coexist. On the other hand, the export destinations of intermediate products from the Chinese manufacturing industry have also expanded to include various entities such as domestically owned enterprises, Chinese multinational corporations, and third-country multinational corporations. However, in recent years, the increasing frequency of anti-dumping sanctions against China, compounded by political maneuvering, has weakened the price advantage of intermediate products, disrupting the favorable situation for the Chinese manufacturing industry to export intermediate products to various entities within importing countries. In light of this, it is of paramount importance to explore the heterogeneous impact effects of anti-dumping measures on the scale of Chinese manufacturing enterprises' exports of intermediate products to various types of enterprises within importing countries, and to formulate export risk prevention measures from the perspective of the ownership dimension of importing countries' enterprises under the impact of anti-dumping measures, which is crucial for promoting the orderly improvement of China's foreign trade quality and maintaining stable growth in foreign trade volume.

In conclusion, this paper, guided by the research question, focuses on the impact effects of anti-dumping measures on Chinese manufacturing exports from the perspective of importing countries' enterprise ownership. The main contributions are as follows:

1.In terms of theoretical research, incorporating the ownership attributes of enterprises within importing countries into the research framework elucidates and analyzes the inherent mechanisms of the impact effects of anti-dumping measures on Chinese manufacturing exports.

2.In terms of empirical analysis, the scale of intermediate product exports from the Chinese manufacturing industry is subdivided based on the ownership attributes of importing countries' enterprises, and the impact effects of anti-dumping measures on the scale of Chinese manufacturing exports to various types of enterprises within importing countries are empirically tested.

3.In terms of data processing, matching, and linking the World Bank's Temporary Trade Barriers (TTBD-GAD) database with the OECD analytical AMNE database and the OECD-ICIOMNE database provide a reliable data foundation for the subsequent empirical work.

The remainder of the paper is organized as follows. Section 2 outlines the literature review and research hypothesis. Section 3 describes the research methodology and index measurement. Section 4 presents the results and discussion. Section 5 presents the conclusions and policy implications.

2. Literature Review and Research Hypothesis

2.1 Literature Review

Anti-dumping measures possess characteristics such as formal legitimacy, strong impact, high specificity, and ease of implementation (Feinberg and Hirsch,1989), making them the most widely used and frequently implemented trade remedy measures (Zanardi,2004). The initiation of anti-dumping measures involves both economic motives and strategic considerations, not solely due to actual instances of dumping and injury (Prusa and Skeath, 2002). Its effectiveness has been widely validated (Ganguli, 2008; Park, 2009), while also exhibiting certain regional characteristics (Bown, 2011). Bown and Crowley (2007) summarized the four main trade effects of anti-dumping measures: trade restriction, trade diversion, trade deflection, and trade suppression.

Existing literature on the impact of anti-dumping measures on export activities predominantly explores from the perspective of exporting countries. Based on the industry dimension of exporting countries, Vandenbussche and Viegelahn (2013) utilized industry-level export data and found that anti-dumping measures had significant trade-destructive effects. Wang et al. (2014) confirmed the inhibitory effect of anti-dumping measures on the dual marginal effects of Chinese export growth, with a greater inhibitory effect on the extensive margin than on the intensive margin. Tang and Zhang (2016) empirically verified the short-term inhibitory effect of anti-dumping measures on export quantity from a dynamic perspective, but it was

not very evident in the long term.

Based on the micro-enterprise dimension of exporting countries, Lu et al. (2013) found that foreign anti-dumping sanctions against China had a negative impact on the variety and export value of products exported by Chinese enterprises. Lu et al. (2018) found that enterprises under anti-dumping investigations would, on one hand, reduce the scope of exports, and on the other hand, increase the complexity of export product portfolios. Li and Whalley (2015) pointed out that besides reducing the quantity of products exported by enterprises, anti-dumping measures also had a negative impact on the survival number of enterprises. Felbermayr and Sandkamp (2020) indicated that the inhibitory effect of anti-dumping on the export behavior of small enterprises was significantly higher than that of medium and large enterprises. Based on micro-level data, Chandra and Long (2013) found that under the impact of anti-dumping measures, firms with initially higher export intensity experienced a greater decline in productivity.

There is limited discussion in existing research on the impact of anti-dumping measures on export activities from the perspective of importing countries, and such studies mostly focus on the examination of trade diversion effects. Trade diversion effect refers to the possibility that the accused country may divert its accused products to third-party markets due to the implementation of anti-dumping measures by the accusing country (Brenton,2001). Chandra (2016), Felbermayr and Sandkamp (2020) have confirmed the trade diversion effect. Bown and Crowley (2007) found that the trade diversion effect resulting from US anti-dumping sanctions on Japan is influenced by the market size, trade policies, and economic development level of the diverting country. Similarly, Lv et al. (2023) pointed out that the trade diversion effect caused by anti-dumping measures is influenced by differences between China and the diverting country in terms of demand structure and comparative advantages. Wang et al. (2015) found through research that the inhibitory effect of anti-dumping measures by developed countries on Chinese exports is higher than the average level and varies by industry.

Through reviewing existing literature, it is evident that scholars have primarily explored the impact of anti-dumping measures on export activities from the perspective of exporting countries. Relevant literature has thoroughly discussed this issue at the industry and micro-enterprise levels. However, there is limited exploration from the perspective of importing countries and existing literature mainly focuses on the direction of trade diversion effects caused by anti-dumping measures. Therefore, this paper, starting from the perspective of ownership attributes of enterprises within importing countries, explores the heterogeneous impact of anti-dumping measures on the scale of intermediate product exports from China to different ownership attributes of enterprises within importing countries.

2.2 Theoretical Analysis and Research Hypotheses

According to Article 6 of the GATT/WTO, dumping refers to the act of selling products in the markets of another country at a price lower than their normal value, with a surge in export volume, causing substantial damage or the threat of substantial damage to the industry of the importing country. Anti-dumping policies are countermeasures taken against the dumping practices of exporting countries. The implementation of anti-dumping policies, on one hand, causes exporting countries to lose their price advantage, increases their export costs, and weakens their motivation to export. On the other hand, it increases the import costs for various types of enterprises within the importing country (the country initiating the anti-dumping measures).

1.Regarding domestic enterprises within the importing country, their production-related relationships are mostly established with enterprises within the same country, and their business decisions are significantly influenced by the domestic market and legal environment. Faced with rising import costs, their motivation to import may decrease. Therefore, under the influence of anti-dumping measures, the scale of intermediate product exports from the exporting country to domestically owned enterprises (DOEs) within the importing country may decrease.

2.Concerning the multinational corporations (MNCs) from the exporting country located within the importing country, they maintain close production-related relationships with the home country (i.e., the exporting country), and their business activities and management decisions are supervised and guided by the parent company, with capital gains ultimately flowing back to the home country. Considering the overall profit, the parent company might continue to supply export products to them. Hence, under the influence of anti-dumping measures, the scale of intermediate product exports from the exporting country to MNCs from the exporting country within the importing country might not decrease.

3.Regarding the third-country MNCs within the importing country, they often seek to maximize profits by sourcing high-quality factor resources for economic activities. Therefore, when the prices of products from the exporting country rise under the influence of anti-dumping measures, their motivation to import might decrease. Consequently, under the influence of anti-dumping measures, the scale of intermediate product exports from the exporting country to the third-country MNCs within the importing country might decrease.

Hypothesis 1: Under the influence of anti-dumping measures, the scale of intermediate product exports from the exporting country to DOEs within the importing country is likely to decrease.

Hypothesis 2: Under the influence of anti-dumping measures, the scale of intermediate product exports to MNCs from the exporting country within the importing country might not decrease.

Hypothesis 3: Under the influence of anti-dumping measures, the scale of intermediate product exports to the third-country MNCs within the importing country is likely to decrease.

3. Methodology, Index Measurement and Data

3.1 Model

This paper utilizes the OECD-ICIOMNE database, the OECD analytical AMNE database, and the World Bank Temporary Trade Barrier (TTBD-GAD) Database. Based on the perspective of ownership of enterprises within importing countries, it explores and analyzes the impact of anti-dumping measures on the export behavior of intermediate goods in China's manufacturing sector. To achieve this, the following econometric model is constructed.

$$EXPORT_{mt}^{jd} = \alpha + \alpha_1 AD_{mj(t-1)} + \alpha_2 \vec{Z} + \lambda_t + \mu_m + \varepsilon_{mt} \quad (1)$$

$$EXPORT_{mt}^{jfc} = \alpha + \alpha_1 AD_{mj(t-1)} + \alpha_2 \vec{Z} + \lambda_t + \mu_m + \varepsilon_{mt} \quad (2)$$

$$EXPORT_{mt}^{jfo} = \alpha + \alpha_1 AD_{mj(t-1)} + \alpha_2 \vec{Z} + \lambda_t + \mu_m + \varepsilon_{mt} \quad (3)$$

The dependent variables, ($EXPORT_{mt}^{jd}$) represents the scale of intermediate goods exports from industry m in China to DOEs within importing country j in year t, ($EXPORT_{mt}^{jfc}$) represents the scale of intermediate goods exports from industry m in China to Chinese MNCs within importing country j in year t, and ($EXPORT_{mt}^{jfo}$) represents the scale of intermediate goods exports from industry m in China to the third-country MNCs within importing country j in year t. The core explanatory variable is ($AD_{mj(t-1)}$), which denotes the intensity of anti-dumping measures faced by industry m from country j in year (t-1). $\vec{Z}$ represents the control variable set, λ_t indicates time fixed effects, μ_m represents industry fixed effects, and ε_{mt} represents the random disturbance term.

3.2 Variable Description

3.2.1 Scale of Intermediate Product Exports

In this paper, the scale of intermediate product exports from sector m of China's manufacturing industry to DOEs within importing country j ($EXPORT_{mt}^{jd}$), to Chinese MNCs located within importing country j ($EXPORT_{mt}^{jfc}$), and to the third-country MNCs located within importing country j ($EXPORT_{mt}^{jfo}$) are used as the dependent variables. Logarithmic values of the corresponding types of intermediate product export amounts are used to characterize them.

The following section introduces the process of constructing the indicators for the scale of intermediate goods exports. This section first presents the basic structure of the sub-database of the OECD analytical AMNE database, namely the bilateral output database, and the inter-country input-output table (OECD-ICIOMNE) with firm type information.

Table 1: The bilateral output database

		Country 1	Country 2	…	Country G
Country 1	Sector 1	x_{1111}	x_{1211}		x_{1G11}
	…	…	…		…
	Sector N	x_{11N1}	x_{12N1}		x_{1GN1}
Country 2	Sector 1	x_{2111}	x_{2211}	…	
	…	…	…		
	Sector N	x_{21N1}	x_{22N1}	…	
…	Sector 1			…	
	…			x_{JKnt}	
	Sector N			…	
Country G	Sector 1	x_{G1N1}			x_{GG11}
	…	…			…
	Sector N	x_{G1N1}			x_{GGN1}

Suppose there are G economies and N sectors worldwide. In Table 1, the countries listed in the first column are host countries, and those listed in the first row are the home countries (i.e., the source of output). The basic element x_{JKnt} (J $\in$ [1, G], K $\in$ [1, G], n $\in$ [1, N]) denotes the output of sector n in host country J in year t, produced by MNCs from country K operating within the host country J. The data located within the shaded area in Table 1 (i.e., J=K) indicates that the output is produced by DOEs. Other data outside the shaded area indicated by solid arrows (i.e., J≠K) suggests that the output is produced by MNCs operating within the host country. Therefore, the total output created by MNCs in sector n of host country J is $\mathrm{GO\_MNC}_{Jnt}=\sum_{J\neq K} x_{JKnt}$. The proportion of output created by Chinese MNCs, within this total, w_{JCnt}, is

$$w_{JCnt}=\frac{x_{JCnt}}{\sum_{K\neq J} x_{JKnt}} \tag{4}$$

The proportion of output created by the third-country MNCs within this total, w_{JOnt}, is

$$w_{JOnt}=\frac{\sum_{K\neq J,C} x_{JKnt}}{\sum_{K\neq J} x_{JKnt}} \tag{5}$$

Table 2: Inter-country input-output table with firm ownership information

			Intermediate Uses							Final Uses				Outputs
			Country 1		Country 2		…	Country G		Country 1	Country 2	…	Country G	
			D	F	D	F	…	D	F					
Intermediate Uses	Country 1	D	Z_{11}^{DD}	Z_{11}^{DF}	Z_{12}^{DD}	Z_{12}^{DF}	…	Z_{1G}^{DD}	Z_{1G}^{DF}	Y_{11}^{D}	Y_{12}^{D}	…	Y_{1G}^{D}	X_1^D
		F	Z_{11}^{FD}	Z_{11}^{FF}	Z_{12}^{DF}	Z_{12}^{FF}	…	Z_{1G}^{DF}	Z_{1G}^{FF}	Y_{11}^{F}	Y_{12}^{F}	…	Y_{1G}^{F}	X_1^F
	Country 2	D	Z_{21}^{DD}	Z_{21}^{DF}	Z_{22}^{DD}	Z_{22}^{DF}	…	Z_{2G}^{DD}	Z_{2G}^{DF}	Y_{21}^{D}	Y_{22}^{D}	…	Y_{2G}^{D}	X_2^D
		F	Z_{21}^{FD}	Z_{21}^{FF}	Z_{22}^{FD}	Z_{22}^{FF}	…	Z_{2G}^{FD}	Z_{2G}^{FF}	Y_{21}^{F}	Y_{22}^{F}	…	Y_{2G}^{F}	X_2^F
	…	…	…	…	…	…	…	…	…	…	…	…	…	…
	Country G	D	Z_{G1}^{DD}	Z_{G1}^{DF}	Z_{G2}^{DD}	Z_{G2}^{DF}	…	Z_{GG}^{DD}	Z_{GG}^{DF}	Y_{G1}^{D}	Y_{G2}^{D}	…	Y_{GG}^{D}	X_G^D
		F	Z_{G1}^{FD}	Z_{G1}^{FF}	Z_{G2}^{FD}	Z_{G2}^{FF}	…	Z_{GG}^{FD}	Z_{GG}^{FF}	Y_{G1}^{F}	Y_{G2}^{F}	…	Y_{GG}^{F}	X_G^F
Value added			Va_1^D	Va_1^F	Va_2^D	Va_2^F	…	Va_G^D	Va_G^D					
Total Inputs			$(X_1^D)'$	$(X_1^F)'$	$(X_2^D)'$	$(X_2^F)'$	…	$(X_G^D)'$	$(X_G^F)'$					

The basic structure of the inter-country input-output table with firm ownership information is illustrated in Table 2. Suppose there are G economies and N sectors worldwide, each sector includes two types of enterprises: domestically owned enterprises (D) and multinational corporations (F). The intermediate input matrix Z consists of 2GN×2GN basic elements, where subscripts denote the supplying and using countries, and superscripts denote supplying and using enterprises. Taking Z_{IJ}^{DF} as an example, it illustrates that intermediate goods produced by domestically owned enterprises (D) in country I are used as intermediate inputs by multinational corporations (F) in country J. The intermediate input matrix for exporting intermediate goods from country I to country J is composed of Z_{IJ}^{DD}, Z_{IJ}^{DF}, Z_{IJ}^{FD}, and Z_{IJ}^{FF}. Among these, Z_{IJ}^{DD} represents intermediate goods exported by domestically owned enterprises in country I to domestically owned enterprises in country J for using as intermediate inputs, Z_{IJ}^{FD} represents intermediate goods exported by multinational corporations in country I to domestically owned enterprises in country J for using as intermediate inputs, and Z_{IJ}^{FF} represents intermediate goods exported by multinational corporations in country I to multinational corporations in country J for using as intermediate inputs.

Table 3: Intermediate input matrix with firm ownership information

			Country J							
			D				F			
			Sector 1	Sector 2	…	Sector N	Sector 1	Sector 2	…	Sector N
Country I	D	Sector 1	$Z_{IJ}^{D_1D_1}$	$Z_{IJ}^{D_1D_2}$	…	$Z_{IJ}^{D_1D_N}$	$Z_{IJ}^{D_1F_1}$	$Z_{IJ}^{D_1F_2}$	…	$Z_{IJ}^{D_1F_N}$
		Sector 2	$Z_{IJ}^{D_2D_1}$	$Z_{IJ}^{D_2D_2}$	…	$Z_{IJ}^{D_2D_N}$	$Z_{IJ}^{D_2F_1}$	$Z_{IJ}^{D_2F_2}$	…	$Z_{IJ}^{D_2F_N}$
		…	…	…	$Z_{IJ}^{D_mD_n}$	…	…	…	$Z_{IJ}^{D_mF_n}$	…
		Sector N	$Z_{IJ}^{D_ND_1}$	$Z_{IJ}^{D_ND_2}$	…	$Z_{IJ}^{D_ND_N}$	$Z_{IJ}^{D_NF_1}$	$Z_{IJ}^{D_NF_2}$	…	$Z_{IJ}^{D_NF_N}$
	F	Sector 1	$Z_{IJ}^{F_1D_1}$	$Z_{IJ}^{F_1D_2}$	…	$Z_{IJ}^{F_1D_N}$	$Z_{IJ}^{F_1F_1}$	$Z_{IJ}^{F_1F_2}$	…	$Z_{IJ}^{F_1F_N}$
		Sector 2	$Z_{IJ}^{F_2D_1}$	$Z_{IJ}^{F_2D_2}$	…	$Z_{IJ}^{F_2D_N}$	$Z_{IJ}^{F_2F_1}$	$Z_{IJ}^{F_2F_2}$	…	$Z_{IJ}^{F_2F_N}$
		…	…	…	$Z_{IJ}^{F_mD_n}$	…	…	…	$Z_{IJ}^{F_mF_n}$	…
		Sector N	$Z_{IJ}^{F_ND_1}$	$Z_{IJ}^{F_ND_2}$	…	$Z_{IJ}^{F_ND_N}$	$Z_{IJ}^{F_NF_1}$	$Z_{IJ}^{F_NF_2}$	…	$Z_{IJ}^{F_NF_N}$

Table 3 further illustrates the basic structure of the intermediate input matrix for intermediate goods exported from country I to country J. $Z_{IJ}^{D_mD_n}$ represents a component of Z_{IJ}^{DD}, indicating that intermediate goods produced by domestically owned enterprises in sector m of country I are used as intermediate inputs by domestically owned enterprises in sector n of country J. Similarly, $Z_{IJ}^{D_mF_n}$ is a component of Z_{IJ}^{DF}, indicating that intermediate goods produced by domestically owned enterprises in sector m of country I are used as intermediate inputs by multinational corporations in sector n of country J. The basic meanings of $Z_{IJ}^{F_mD_n}$ and $Z_{IJ}^{F_mF_n}$ are not reiterated here.

This paper further completes the data disaggregation of the export value of intermediate goods from manufacturing sector m in China to various types of enterprises within destination country j. The specific calculation formula is as follows.

The export value of intermediate goods from manufacturing sector m in China to domestically owned enterprises within destination country j is:

$$EXPORT_m^{jd}=\sum_n(Z_{CJ}^{D_mD_n}+Z_{CJ}^{F_mD_n}) \tag{6}$$

The export value of intermediate goods from manufacturing sector m in China to Chinese MNCs within destination country j is:

$$EXPORT_m^{jfc}=\sum_n[(Z_{CJ}^{D_mF_n}+Z_{CJ}^{F_mF_n})\times w_{JCnt}] \quad (7)$$

The export value of intermediate goods from manufacturing sector m in China to the third-country MNCs within destination country j is:

$$EXPORT_m^{jfo}=\sum_n[(Z_{CJ}^{D_mF_n}+Z_{CJ}^{F_mF_n})\times w_{JOnt}] \quad (8)$$

(I) Statistical Analysis of the Trend in the Export Value of Intermediate Products, Distinguishing Ownership of Enterprises within Importing Countries

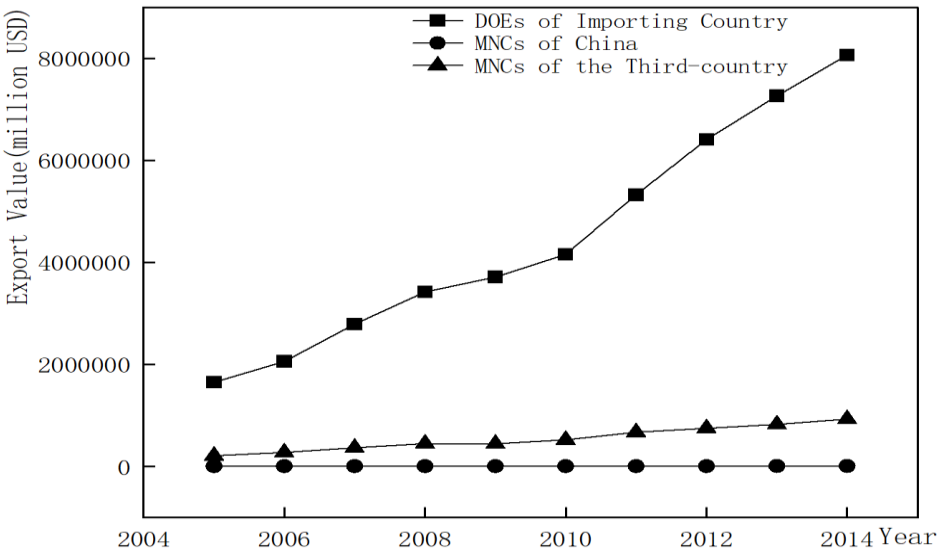

Figure 1: Export value of intermediate products to various ownership enterprises within importing countries

Figure 1 illustrates the value variations from 2005 to 2014 of intermediate product exports from China's manufacturing sector to DOEs, Chinese MNCs within importing countries, and the third-country MNCs within importing countries. Among these, the export value of intermediate products to DOEs in importing countries have consistently been significantly higher than the other two categories of export activities. The export value of intermediate products to Chinese MNCs within importing countries is at the lowest levels. This suggests that there is a need for further improvement in the pace of Chinese enterprises' expansion abroad.

(II) Statistical Analysis of the Trend in the Export Value of Intermediate Product, Distinguishing Factor Endowments of China's Manufacturing Sector and Ownership of Enterprises within Importing Countries

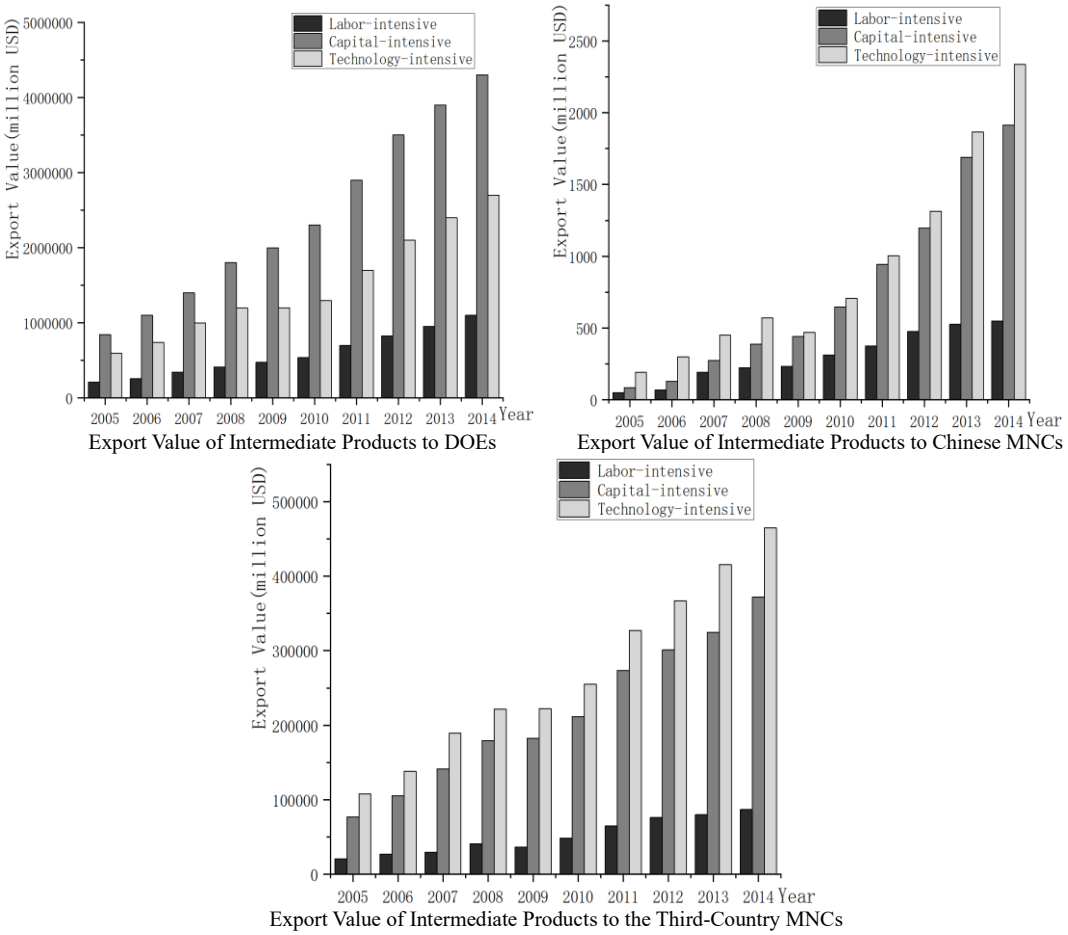

Figure 2: Export value of intermediate products, distinguishing heterogeneity in factor endowments of China's manufacturing sector and ownership of enterprises within importing countries

Figure 2 illustrates the value variations of intermediate product exports from heterogeneous factor endowment industries of China's manufacturing sector to various types of enterprises within importing countries from 2005 to 2014. For exports to DOEs in importing countries, the value of exports from capital-intensive industries is the highest, followed by technology-intensive industries, while the value of exports from labor-intensive industries is the lowest. For exports to Chinese MNCs within importing countries, the value of intermediate product exports from capital-intensive and technology-intensive industries is relatively high and shows similar growth rates, whereas the value of exports from labor-intensive industries is

the lowest and has a smaller growth rate. For exports to the third-country MNCs within importing countries, the results indicate that the value of intermediate product exports from technology-intensive and capital-intensive industries is significantly higher than that from labor-intensive industries.

(III) Statistical Analysis of the Trend in the Export Value of Intermediate Product, Distinguishing the Region of Importing Countries and Ownership of Enterprises within Importing Countries

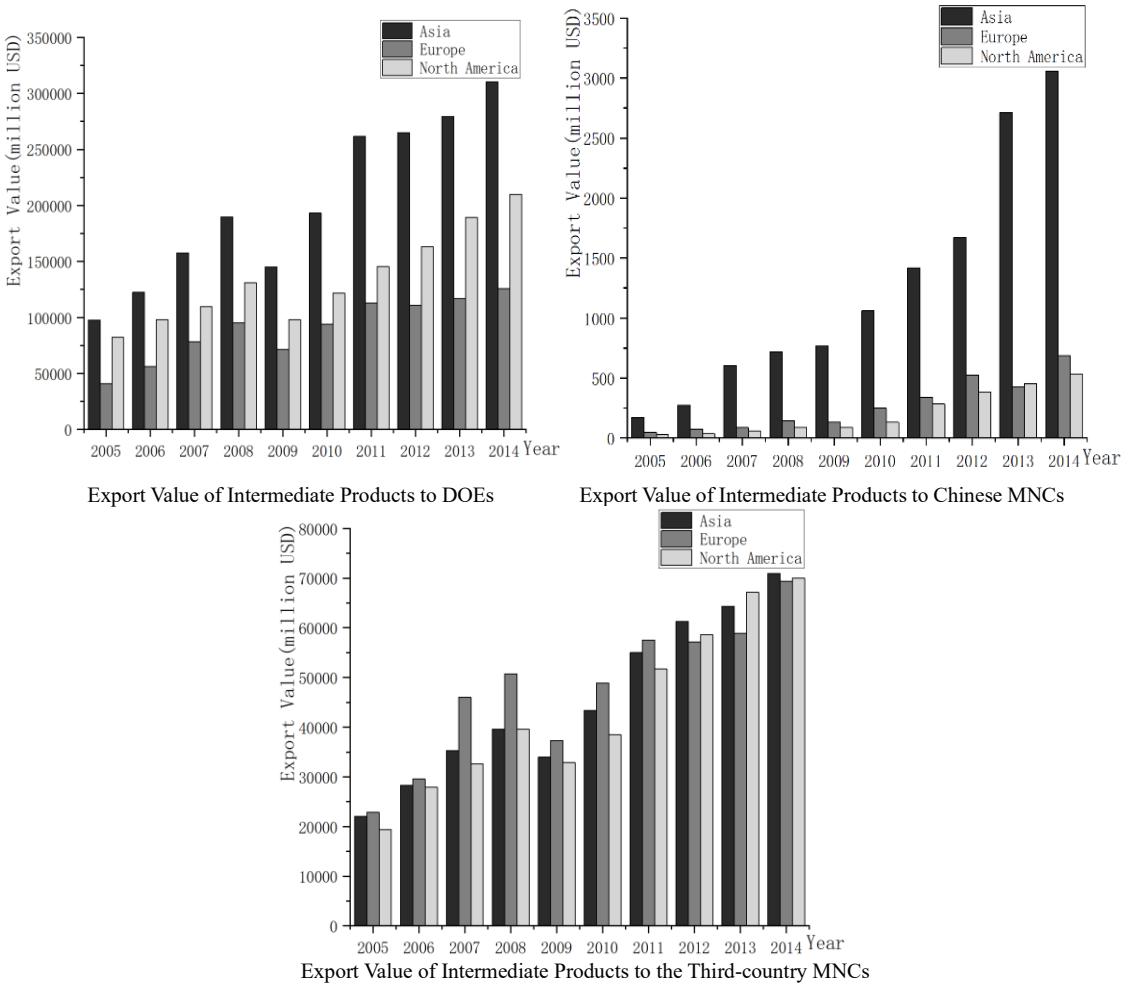

Figure 3: Export value of intermediate products, distinguishing the region of importing countries and ownership of enterprises within importing countries

Figure 3 displays the trend in the value variation of intermediate product exports from China's manufacturing sector to various types of enterprises within the three major core regions of the world from 2005 to 2014. Based on geographical location, the value of exports to DOEs is subdivided into intermediate product exports to Asian, European, and North American DOEs. The results reveal that the value of

intermediate product exports to Asian DOEs is significantly higher than that to North American enterprises, while the value of exports to European DOEs is at the lowest level. Similarly, when subdividing exports to Chinese MNCs and the third-country MNCs based on the same criteria, it is observed that for the former, the value of exports is highest to Asian regions, followed by European and North American regions. However, for the latter, the value of intermediate product exports to MNCs from third countries within the three major regions is relatively similar.

3.2.2 Intensity of Anti-dumping Measures

In this paper, the intensity of anti-dumping measures ($AD_{mj(t-1)}$) is used as the core explanatory variable, specifically characterized by the frequency of anti-dumping investigations initiated by various countries against China with a lag of one period.

3.2.3 Control Variables

1) Output Structure (STRUCTURE): Expressed as the ratio of industry output to the total industry output.
2) Openness: Represented by the ratio of industry exports to output.
3) Revealed Comparative Advantage Index (RCA): Indicated by the ratio of industry export value as a share of a country's total industry export value to the share of world industry export value as a proportion of total world industry exports.
4) VA_PI: Represented by the level of value-added price.

3.2.4 Data Sources and Descriptive Statistics

The data for measuring the scale of intermediate product exports from China's manufacturing industry to various types of enterprises within importing countries mainly come from the OECD-ICIOMNE database and the OECD analytical AMNE database. These databases cover cross-border input-output data with firm ownership information and bilateral output data for 59 countries (including 36 OECD countries and 23 non-OECD countries), as well as data for other regions worldwide from 2005 to 2016. The data on anti-dumping intensity come from the World Bank Temporary Trade Barriers database (TTBD-GAD), covering anti-dumping data for 33 major countries and other regions worldwide from 1980 to 2019. The control variables in this paper primarily come from the World Input-Output Database (WIOD) Socio Economic Accounts (SEA), covering variables such as output, prices, capital stock, and labor for 43 countries and regions classified under the ISIC.REV4 classification standard from 2000 to 2014. Considering data availability and to avoid endogeneity issues arising from bidirectional causality, the data intervals for the dependent and control variables are delimited as 2005-2014, and for the explanatory variables as 2004-2013. Descriptive statistics for the aforementioned variables are presented in Table 4.

Table 4: Summary statistics

VarName	Obs	Mean	SD	Min	Max
$EXPORT^{d}$	9280	4.1044	2.2096	0.0000	10.7647
$EXPORT^{fc}$	9280	0.4097	0.7499	0.0000	6.3472
$EXPORT^{fo}$	9280	3.2693	2.0156	0.0000	9.4963
AD	9280	1.2025	6.0374	0.0000	149.0000
STRUCTURE	9280	0.0321	0.0176	0.0084	0.0668
OPENNESS	9280	0.1846	0.1305	0.0309	0.5424
VA_PI	9280	126.6169	46.7591	20.6140	268.8180

4. Results and Discussion

4.1 Benchmark Regression Results

Table 5 displays the changes in the scale of intermediate product exports from Chinese manufacturing enterprises to various types of enterprises within importing countries under the influence of anti-dumping measures. Columns (1) and (3) of the regression results show that under the impact of anti-dumping measures, the damage suffered by Chinese manufacturing enterprises in their exports of intermediate products to DOEs in importing countries is greater than the scale of exports to the Third-country MNCs within importing countries, confirming Hypothesis 1 and Hypothesis 3. One possible reason is that, compared to the Third-country MNCs, DOEs are mainly owned and controlled by domestic investors, with their capital returns influenced significantly by the domestic market and legal environment. This reduces their willingness to cooperate with Chinese enterprises, making it more difficult for Chinese enterprises to export, thereby resulting in a more severe decline in the scale of intermediate product exports. Column (2) of the regression results shows that the scale of intermediate product exports from Chinese manufacturing enterprises to Chinese MNCs within importing countries did not suffer significant negative impacts from anti-dumping measures, confirming Hypothesis 2. This might be because, on one hand, Chinese manufacturing enterprises have established stable supply chain relationships with outbound MNCs. On the other hand, the Chinese headquarters of MNCs, driven by considerations of maximizing overall profits and strong national sentiment, continue to supply upstream products to multinational corporations located within importing countries.

Table 5: Results of benchmark regression

Variables	(1)	(2)	(3)
	$EXPORT^d$	$EXPORT^{fc}$	$EXPORT^{fo}$
AD_{t-1}	-0.0018***	0.0007	-0.0016**
	(-2.73)	(1.30)	(-2.24)
STRUCTURE	25.2686***	-0.7135	24.7705***
	(4.65)	(-0.14)	(5.18)
OPENNESS	0.1361	-0.7102**	-0.6424
	(0.26)	(-2.18)	(-1.38)
RCA	0.6266***	0.1458**	0.5972***
	(7.05)	(2.16)	(7.40)
VA_PI	-0.0020***	-0.0009**	-0.0024***
	(-2.93)	(-2.06)	(-4.08)
Constants	1.8527***	0.2481	1.4038***
	(9.97)	(1.40)	(8.30)
Year FE	Yes	Yes	Yes
Country-Industry FE	Yes	Yes	Yes
N	9280	9280	9280
R^2	0.4766	0.2426	0.4932

* p<0.1, ** p<0.05, *** p<0.01

4.2 Endogeneity

Considering the potential endogeneity issues between the scale of intermediate product exports from Chinese manufacturing enterprises to various enterprises within the importing country's borders and anti-dumping intensity, this paper addresses the reverse causality that may exist in the benchmark regression section by using the lagged one-period anti-dumping intensity faced by China to mitigate potential evasion of anti-dumping measures. Additionally, this paper uses the lagged one-period anti-dumping intensity faced by India as an instrumental variable and employs two-stage least squares method to further address endogeneity issues. On the one hand, the anti-dumping intensity faced by various industries in India does not directly impact the scale of China's exports of intermediate products to enterprises within the importing country, satisfying the requirement of instrumental variable exogeneity. On the other hand, the industrial structures of China and India are similar, and there are numerous shared trading partner countries. Both sides exhibit high similarity in facing anti-dumping investigations, meeting the correlation requirements of instrumental variables. Therefore, selecting them as instrumental variables is reasonably justified. The estimation results in Table 6 show that the coefficients' signs and significance of the core explanatory variables remain unchanged, and they pass the tests for weak instrument and under identification, indicating the robustness of the conclusions after addressing endogeneity issues.

Table 6: Results of endogenous processing

Variables	(1)	(2)	(3)
	$EXPORT^{d}$	$EXPORT^{fc}$	$EXPORT^{fo}$
AD_{t-1}	-0.0020***	0.0010	-0.0017**
	(-2.89)	(1.63)	(-2.17)
STRUCTURE	25.3199***	-0.8006	24.7784***
	(8.24)	(-0.29)	(8.73)
OPENNESS	0.1375	-0.7126***	-0.6422**
	(0.40)	(-3.59)	(-2.13)
RCA	0.6268***	0.1454***	0.5972***
	(12.66)	(3.88)	(13.17)
VA_PI	-0.0020***	-0.0009***	-0.0024***
	(-5.12)	(-3.54)	(-6.99)
Year FE	Yes	Yes	Yes
Country-Industry FE	Yes	Yes	Yes
Kleibergen-Paap rk LM statistic	58.362 [0.0000]	58.362 [0.0000]	58.362 [0.0000]
Kleibergen–Paap rk Wald F statistic	1525.678 {16.38}	1525.678 {16.38}	1525.678 {16.38}
N	9280	9280	9280
R2	0.4766	0.2425	0.4932

* p<0.1, ** p<0.05, *** p<0.01

4.3 Robustness Test

4.3.1 Based on Adding Control Variables

Firstly, the expansion of the labor force size contributes to enhancing the output level, which, in turn, increases the scale of exports, indicating a potential correlation between labor force size and export scale. To ensure the robustness of the research findings and to overcome the interference of heteroscedasticity, this paper selects the number of employees (EMP) from Socio Economic Accounts (SEA) and after applying logarithmic transformation, incorporates it as a control variable into the regression equation. Secondly, the extensive span of the data sample interval might be influenced by factors such as economic growth and inflation. Therefore, this paper incorporates the intermediate input price index (II_PI), which reflects changes in the prices of intermediate goods, as a control variable. The factor intensity might affect a country's product production and export situation. China is recognized as a labor-intensive country; it is necessary to consider labor intensity (LCI) when examining export issues. This paper uses the ratio of labor compensation to capital compensation to measure labor intensity and includes it as a control variable. After the addition of three control variables, namely, labor force size, the intermediate input price index, and labor intensity, columns (1) - (3) of Table 7 show that the

coefficient signs, magnitude relations, and significance of the core explanatory variables have not undergone significant changes, proving the robustness of the research conclusions.

Table 7: Results of adding control variables

Variables	(1)	(2)	(3)
	$EXPORT^d$	$EXPORT^{fc}$	$EXPORT^{fo}$
AD_{t-1}	-0.0015**	0.0007	-0.0015**
	(-2.27)	(1.34)	(-2.02)
STRUCTURE	34.9437***	5.6501	33.7153***
	(5.64)	(1.09)	(6.16)
OPENNESS	0.0768	-0.5856*	-0.5734
	(0.14)	(-1.80)	(-1.20)
ln EMP	-0.1651*	-0.0310	-0.0600
	(-1.94)	(-0.44)	(-0.77)
RCA	0.6095***	0.1106*	0.5611***
	(6.91)	(1.65)	(6.91)
VA_PI	-0.0004	-0.0004	-0.0012**
	(-0.73)	(-0.92)	(-2.36)
II_PI	0.0088***	-0.0001	0.0040**
	(4.25)	(-0.05)	(2.13)
LCI	0.7424***	0.2863***	0.5707***
	(5.41)	(2.99)	(4.67)
Year FE	YES	YES	YES
Country-Industry FE	YES	YES	YES
Constants	1.4343*	0.0902	0.7365
	(1.92)	(0.15)	(1.08)
N	9280	9280	9280
R2	0.4853	0.2456	0.4984

* p<0.1, ** p<0.05, *** p<0.01

4.3.2 Based on Adjusting Anti-Dumping Data

The reason for the anti-dumping intensity observed in the sample data is zero could be: (1) The industry has never been subjected to an anti-dumping investigation during the sample period. (2) The industry has not undergone anti-dumping investigations in certain years. To eliminate the interference of the first reason on the empirical results, this study sets the anti-dumping intensity of industries for which the importing country has not initiated an anti-dumping investigation throughout the sample period as missing values and conducts robustness tests again. The regression results in columns (1)-(3) of Table 8 indicate that the signs,

magnitudes, and significance of the coefficients of the core explanatory variables have not changed significantly, demonstrating the robustness of the research conclusions.

Table 8: Robustness test results of antidumping data adjustment

Variables	(1)	(2)	(3)
	$EXPORT^{d}$	$EXPORT^{fc}$	$EXPORT^{fo}$
AD_{t-1}	-0.0028***	0.0004	-0.0023***
	(-4.22)	(0.64)	(-3.15)
STRUCTURE	31.1561***	5.4059	30.1731***
	(4.64)	(0.81)	(4.89)
OPENNESS	-0.2515	-1.2660***	-1.0747*
	(-0.36)	(-3.29)	(-1.69)
RCA	0.7976***	0.2190***	0.7561***
	(7.44)	(2.80)	(7.72)
VA_PI	-0.0022***	-0.0016***	-0.0027***
	(-2.62)	(-3.61)	(-3.70)
Year FE	YES	YES	YES
Country-Industry FE	YES	YES	YES
Constants	1.3920***	0.0849	1.1149***
	(5.77)	(0.33)	(4.84)
N	5530	5530	5530
R2	0.4506	0.2213	0.4903

* p<0.1, ** p<0.05, *** p<0.01

4.3.3 Based on Excluding the Impact of Financial Crisis

The outbreak of the financial crisis led to a global economic recession, with sustained contraction in international market demand, restraining export activities and sparking tendencies towards trade protectionism. To eliminate the impact of the financial crisis, this paper conducts robustness tests after excluding data from 2008. Table 9 displays the regression results in columns (1)-(3) after excluding data from 2008, revealing that the signs, magnitudes, and significance of the coefficients of the core explanatory variables have not changed significantly. This indicates the robustness of the research conclusions.

Table 9: Robustness regression results based on financial crisis

Variables	(1)	(2)	(3)
	$EXPORT^{d}$	$EXPORT^{fc}$	$EXPORT^{fo}$
AD_{t-1}	-0.0022***	0.0006	-0.0019**
	(-3.18)	(1.12)	(-2.49)
STRUCTURE	25.9613***	-0.2035	26.1141***
	(4.72)	(-0.04)	(5.32)
OPENNESS	0.1648	-0.6703**	-0.6322
	(0.31)	(-2.02)	(-1.34)
RCA	0.5773***	0.1348*	0.5450***
	(6.41)	(1.91)	(6.61)
VA_PI	-0.0021***	-0.0010**	-0.0027***
	(-2.95)	(-2.04)	(-4.26)
Year FE	YES	YES	YES
Country-Industry FE	YES	YES	YES
Constants	1.9184***	0.2541	1.4738***
	(10.21)	(1.40)	(8.53)
N	8352	8352	8352
R2	0.4982	0.2480	0.5120

* p<0.1, ** p<0.05, *** p<0.01

4.4 Heterogeneity Analysis

4.4.1 Based on the Factor Endowments of Chinese Manufacturing

This paper segments the scale of intermediate product exports from the Chinese manufacturing sector to various enterprises within the importing countries, based on the heterogeneity of factor endowments. Specifically, the export behavior of intermediate products from China's manufacturing industry to DOEs in importing countries is categorized into labor-intensive, capital-intensive, and technology-intensive intermediate product export behaviors. Similarly, the export activities of the Chinese manufacturing sector to Chinese MNCs and the third-country MNCs within the importing countries are classified using the same criteria. On this basis, empirical research is conducted on the effects of anti-dumping measures on the export activities of intermediate products by labor-intensive, capital-intensive, and technology-intensive enterprises. Regression results in columns (1)-(3) show that anti-dumping measures positively promote the scale of exports of intermediate products from labor-intensive industries to DOEs in the importing countries, have a significant inhibitory effect on the export activities of capital-intensive industries, and do not significantly affect the export activities of technology-intensive industries. The possible reason is that labor-intensive industries, after facing anti-dumping measures, can enhance their resource allocation and shock response capabilities, compelling an increase in their export capacity. Compared to labor-

intensive industries, capital-intensive industries bear higher fixed costs and have relatively poor liquidity, resulting in lower flexibility in responding to demand shocks. Technology-intensive industries, focusing on R&D, often possess highly specialized technical knowledge and professional skills with relatively high irreplaceability, maintaining stable export capabilities despite the price disadvantages caused by anti-dumping measures. Regression results in columns (4)-(6) indicate that anti-dumping measures positively promote the scale of exports of intermediate products from labor-intensive industries to Chinese MNCs within the importing countries but do not significantly affect the export activities of capital-intensive and technology-intensive industries. Compared to the regression results in columns (1)-(3), the notable change is observed in the capital-intensive industry, which did not experience a significant impact from anti-dumping measures. This could be due to the close strategic partnership and input-output relationships maintained between Chinese manufacturing enterprises, especially multinational corporation headquarters, and Chinese multinational corporations operating abroad. The relatively low financial turnover pressure in the capital-intensive industry under anti-dumping measures may account for this. The pattern observed in columns (7)-(9) of the regression results exhibits similarities to columns (1)-(3). Anti-dumping measures exert a squeezing effect on the export scale of labor-intensive industries, significantly dampen the export scale of capital-intensive industries, and have a non-significant impact on the export scale of technology-intensive industries. This could be attributed to both parties' cooperation with Chinese manufacturing enterprises based on input-output relationships. Strategic decisions are controlled by the interests of the enterprises themselves or influenced by domestic political intentions. This is due to the relatively low level of influence from the Chinese government and enterprises.

Table 10: Regression results based on factor endowments

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$EXPORT^d$	$EXPORT^d$	$EXPORT^d$	$EXPORT^{fc}$	$EXPORT^{fc}$	$EXPORT^{fc}$	$EXPORT^{fo}$	$EXPORT^{fo}$	$EXPORT^{fo}$
	labor	capital	technology	labor	capital	technology	labor	capital	technology
AD_{t-1}	0.0017*	-0.0028***	-0.0054	0.0029***	-0.0012	0.0114	0.0028***	-0.0035***	0.0024
	(1.70)	(-2.71)	(-1.22)	(3.46)	(-1.51)	(1.48)	(2.84)	(-3.56)	(0.63)
STRUCTURE	-176.6189***	40.3659***	17.1442***	-112.2352***	11.8597*	4.7169	-169.0308***	47.6683***	17.8456***
	(-4.47)	(4.59)	(2.88)	(-4.79)	(1.88)	(0.78)	(-5.37)	(5.65)	(3.54)
OPENNESS	-0.3012	3.5546***	0.2498	-0.7006	-3.3731***	-1.9913***	1.1822	0.1066	-0.6074
	(-0.31)	(2.63)	(0.33)	(-1.14)	(-3.25)	(-3.17)	(1.29)	(0.09)	(-0.83)
RCA	0.9394***	0.6707***	0.4564**	0.2260*	0.3886***	0.6966***	0.6533***	0.9601***	0.4107**
	(5.15)	(4.29)	(2.28)	(1.76)	(3.89)	(3.76)	(4.03)	(7.01)	(2.15)
VA_PI	0.0199***	-0.0055***	0.0005	0.0049***	0.0005	-0.0017**	0.0089***	-0.0044***	0.0004
	(4.88)	(-5.37)	(0.72)	(2.73)	(0.80)	(-2.43)	(2.62)	(-4.94)	(0.63)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constants	2.3816***	1.4466***	2.1602***	1.7936***	-0.3468*	-0.1790	3.0411***	0.3880	1.8931***
	(4.53)	(4.87)	(7.86)	(4.01)	(-1.84)	(-0.66)	(6.23)	(1.41)	(7.83)
N	1740	4060	3480	1740	4060	3480	1740	4060	3480
R2	0.5682	0.5308	0.4361	0.2833	0.2482	0.2646	0.5540	0.5410	0.4728

* p<0.1, ** p<0.05, *** p<0.01

4.4.2 Based on the Importing Country's Regional Affiliation

This paper subdivides the scale of intermediate product exports to DOEs based on the importing country's regional affiliation into exports targeting Asia, Europe, and North America. Similarly, the scale of intermediate product exports to Chinese MNCs and the third-country MNCs is categorized using the same criteria. On this foundation, a heterogeneity analysis is conducted on the effects of anti-dumping measures on the scale of intermediate product exports from Chinese manufacturing to various enterprises within the world's three core regions. Regression results in columns (1)-(3) indicate that anti-dumping measures significantly inhibit the scale of intermediate product exports to DOEs in Europe and North America, while their impact on exports to Asian regions is not significant. This may be attributed to the current formation of a tripartite regional value chain structure across Asia, Europe, and North America, where intra-regional closely knit cooperative relations are formed. China plays a key role as an important source of added value in the Asian production network, holding a pivotal position as the network's operational center node. Asian countries' high dependency on China may explain the negligible impact on its exports. Regression results in columns (4)-(6) show that anti-dumping measures do not significantly affect the scale of intermediate product exports to Chinese MNCs in Asia, Europe, or North America. A possible explanation is that Chinese enterprises, leveraging the factor endowment advantages of various countries from a globalization development perspective, establish overseas MNC subsidiaries to profit, maintaining close production links and supervising their business activities and management decisions to ensure alignment with the overall development strategy. Therefore, facing anti-dumping measures, Chinese enterprises may continue to supply intermediate input products to their MNCs to maximize overall profits. Similar to the findings in columns (1)-(3), results in columns (7)-(9) reveal that anti-dumping measures significantly inhibit the scale of intermediate product exports to third-country MNCs in Europe and North America, while their impact on exports to Asian third-country MNCs is not significant. A comparison between column (2) and column (8) finds that regarding exports targeting the European region, the scale of intermediate product exports to domestically owned enterprises is more adversely affected by anti-dumping measures than to third-country MNCs. A similar pattern is observed for exports targeting the North American region, as shown in the comparison between column (3) and column (9). This could be because, compared to domestically owned enterprises, third-country MNCs seek advantageous factor resources globally and establish production network relations. They maintain relatively close input-output cooperation with China. Hence, under anti-dumping measures, the scale of China's intermediate product exports to third-country MNCs within the importing countries is less adversely affected than that to domestically owned enterprises.

Table 11: Regression results based on regional membership relationships of importing countries

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$EXPORT^d$	$EXPORT^d$	$EXPORT^d$	$EXPORT^{fc}$	$EXPORT^{fc}$	$EXPORT^{fc}$	$EXPORT^{fo}$	$EXPORT^{fo}$	$EXPORT^{fo}$
	Asia	Europe	North America	Asia	Europe	North America	Asia	Europe	North America
AD_{t-1}	-0.0002	-0.0040***	-0.0029***	-0.0019	-0.0006	0.0008	0.0002	-0.0031***	-0.0022**
	(-0.12)	(-5.13)	(-5.13)	(-0.58)	(-1.06)	(0.40)	(0.17)	(-3.73)	(-2.26)
STRUCTURE	-2.6242	32.3001***	37.1908***	1.4161	-1.9126	1.6891	3.7277	30.9056***	31.9534***
	(-0.24)	(4.65)	(2.68)	(0.12)	(-0.33)	(0.06)	(0.39)	(4.80)	(2.84)
OPENNESS	1.3176	0.2402	-2.2081	0.2232	-0.7096**	-3.6926**	1.0056	-0.9405	-1.0389
	(1.22)	(0.34)	(-1.60)	(0.24)	(-2.26)	(-2.36)	(1.01)	(-1.51)	(-0.85)
RCA	0.4569**	0.7114***	0.9244***	-0.0026	0.1512**	0.6238*	0.3835**	0.7118***	0.6033**
	(2.48)	(6.34)	(3.45)	(-0.01)	(2.31)	(1.71)	(2.21)	(6.90)	(2.42)
VA_PI	0.0006	-0.0026***	-0.0039*	0.0007	-0.0011***	-0.0038**	-0.0001	-0.0029***	-0.0046**
	(0.47)	(-3.38)	(-1.74)	(0.44)	(-3.33)	(-2.20)	(-0.05)	(-4.18)	(-2.40)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constants	3.2383***	0.9656***	3.1445***	0.1588	0.1918	0.5234	2.3251***	0.7649***	2.8403***
	(8.11)	(3.88)	(7.78)	(0.43)	(0.87)	(0.51)	(6.92)	(3.20)	(7.58)
N	2080	5120	640	2080	5120	640	2080	5120	640
R2	0.6482	0.3688	0.5975	0.3721	0.1371	0.4736	0.5694	0.4117	0.6506

* p<0.1, ** p<0.05, *** p<0.0

5. Conclusion and Implications

Based on the ownership dimension of importing country enterprises, this paper examines the impact of anti-dumping measures on the export scale of intermediate products in China's manufacturing industry. The main conclusions include:

Firstly, under the impact of anti-dumping measures, the negative effects on the export scale of intermediate products from China's manufacturing industry to DOEs in importing countries are higher than those to the third-country MNCs within the importing countries. However, the export scale of intermediate products from China's manufacturing industry to Chinese MNCs located within the importing countries is not significantly affected. Secondly, the heterogeneity of factor endowments in China's manufacturing industry affects the relationship between anti-dumping measures and the export scale of intermediate products as follows: (1) Anti-dumping measures positively promote the export scale of intermediate products from labor-intensive industries to DOEs in importing countries, significantly suppress the export behavior of capital-intensive industries, while having no significant impact on technology-intensive industries. (2) Anti-dumping measures positively promote the export scale of intermediate products from labor-intensive industries to Chinese MNCs in importing countries, with no significant impact on the export behavior of capital-intensive or technology-intensive industries. (3) Anti-dumping measures exert a constraining effect on the export scale of labor-intensive industries and significantly negative impacts on capital-intensive industries, while the impact on technology-intensive industries is not significant. Thirdly, the heterogeneity of importing country regions affects the relationship between anti-dumping measures and the export scale of intermediate products as follows: (1) Anti-dumping measures significantly suppress the export scale of intermediate products to DOEs in the European and North American regions, but their impact on the export scale to DOEs in the Asian region is not significant. (2) Anti-dumping measures do not significantly affect the export scale of intermediate products to Chinese MNCs in the Asian, European, and North American regions. (3) Anti-dumping measures significantly suppress the export scale of intermediate products to the third-country MNCs in the European and North American regions, while their impact on the export scale to the third-country MNCs in the Asian region is not significant.

Based on the above conclusions, this paper obtains the following insights.

In response to anti-dumping sanctions, at the national level, there should be the establishment of a robust legal system, the full utilization of trade dispute settlement mechanisms, and active resistance against trade protectionism. At the corporate level, it is crucial to scientifically assess potential risks, actively defend against anti-dumping investigations, optimize product structures, enhance product competitiveness, increase the diversification of export markets, and actively diversify operational risks.

Engaging in cross-border investment activities is advantageous for addressing anti-dumping sanctions. To achieve this, at the national level, there should be increased

policy support for corporate internationalization, refinement of bilateral investment cooperation mechanisms, and active cultivation of competitive large multinational corporations. At the corporate level, efforts should be made to actively establish distribution and warehousing centers within importing countries, increase the channels and coverage of export trade, cultivate stable supply chain relationships between multinational corporations and domestic enterprises, and actively promote the export of domestic components and materials in the face of risk impacts.

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