The Impact of Trade Liberalization on Intermediate Goods on the High-quality Development of Enterprises

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Abstract. Selecting Chinese A-share manufacturing listed companies from 2005 to 2021 as research objects, analyzing the impact and mechanism of the liberalization of intermediate goods trade on the high-quality development of manufacturing enterprises. The study found that the liberalization of intermediate goods trade significantly promotes the high-quality development of manufacturing enterprises. Therefore, it is necessary to continue to promote the process of trade liberalization, improve relevant policy provisions, and further promote enterprises to achieve high-quality development.

Keywords: Trade liberalization, High-quality development, Research and development incentives.

1 INTRODUCTION

Trade liberalization enhances the openness of the market environment, promotes the transnational flow of goods, capital, technology, and personnel, thereby enhancing the feasibility of enterprises to access advanced technology and knowledge[1].

At the same time, trade liberalization also intensifies market competition, forcing enterprises to continuously enhance their technological capabilities and product competitiveness to maintain a competitive advantage.

Scholars main focused on the impact of trade liberalization on the micro-level of enterprises, mainly on product quality, enterprise innovation, and environmental performance. In the study by Fan Haichao et al. (2022), it was found that trade liberalization encourages enterprises to improve the quality of export products, leading to higher product pricing and optimization of resource allocation. Liu Xinheng et al. (2022) and Sudani et al. (2021)[9] respectively examined the impact of trade liberalization on corporate environment from the perspectives of pollution emissions and emission reduction behavior. At the same time, trade liberalization promotes the selection of clean technologies by enterprises, which is conducive to the implementation of emission reduction behavior. Zhao Chi et al. (2024) studied the impact of trade liberalization on enterprise technological innovation[2].

In conclusion, compared with existing studies, the main contributions of this paper is the research on the liberalization of intermediate goods trade and the high-quality

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development of Chinese manufacturing enterprises is still limited, and further deepening and supplementation is needed.

2 STUDY DESIGN

2.1 Sample Selection and Data Source

This study selected Chinese A-share listed manufacturing companies from 2005 to 2021 as research subjects. The data mainly include financial data at the company level and tariff data at the industry level, sourced from CSMAR and the World Bank's WITS database.

2.2 Model Setting

Baseline regression model

$$tfpop_{j,i,t} = \beta_0 + \beta_1 interT_{j,t} + \beta_2 Z_{j,i,t} + \psi_i + \psi_t + \xi_{j,i,t} \quad (1)$$

In the equation (1) subscripts j, i, and t represent industry, firm, and time, $tfpop_{j,i,t}$ representing the total factor productivity level of firm i in industry j in year t, interTj,t representing the tariff level of industry j in year t. and Zj,i,t representing the control variable includes firm age (age), firm size (size), capital structure (lev), corporate governance structure (sc10), firm financing constraints (sa), and capital-labor ratio (lgkl). In addition, fixed effects for firm and time are considered to mitigate potential issues of spurious regression and endogeneity. $\xi_{j,i,t}$ is random error term.

2.3 The Explained Variables: Enterprise High-Quality Development Level

This paper selects a relatively common quantitative method within the academic community to measure the level of high-quality development of enterprises.The main calculation methods for total factor productivity include the OP, LP , OLS , and FE method.Based on comparative analysis[3], this paper chooses using the OP method to calculate enterprise total factor productivity, and conducting robustness tests using the LP method.

2.4 Explanation Variable: Intermediate Products Trade Liberalization

Following the approach of Amiti and Konings, industry-specific intermediate goods import tariff rates are utilized to measure intermediate goods trade liberalization. Firstly, it is necessary to calculate the final products tariffs for the industry, the specific calculation formula is shown in the equation.

$$finalT_{jt} = \frac{\sum_{m \in I_j} n_{mt} \times tariff_{mt}^{hs6}}{\sum_{m \in I_j} n_{mt}} \quad (2)$$

In the equation (2) subscripts m, j, and t represent products, industries, and time. hs6 represents the six-digit HS product code, nmt represents the tariff line number of product m in the t year of the HS six-digit code, $tariff_{mt}^{hs6}$ representing the MFN import duty rate of product m in the t year of the six-digit code, I_j representing a set of products in industry j. Calculate the import duties of the industry at the two-digit level of classification of national economy and industry (CIC)[4], where the decrease in duties represents an increase in the degree of trade liberalization.

$$interT_{jt} = \sum_{g \in G_j} \lambda_{gt} \times finalT_{gt} \tag{3}$$

In the equation (3) $interT_{jt}$ representing the import duty on intermediate products, $G_j$representing the aggregation of all factors of industry G, λ_{gt} representing the proportion of factor g input, measured by the proportion of the cost of input factor g to the total cost of input factors in industry j, calculated by the "China Input-Output Table."

2.5 Control Variables

Besides liberalization in intermediate goods trade, there are other factors may influence the high-quality development of enterprises. In this paper, consider the following control variables: firm age (age), firm size (size),capital structure (lev),corporate governance structure (sc10),financing constraints of enterprises (sa), capital-labor ratio of enterprises (lgkl)[6].

3 EMPIRICAL ANALYSIS

3.1 Descriptive Statistics

Table 1. Descriptive statistical.

Variable	N	Mean	P50	SD	Min	Max
tfpop	13434	6.640	6.572	0.773	3.637	10.12
interT	13434	2.035	2.092	0.509	0.761	3.128
age	13434	2.829	2.890	0.371	0.693	3.989
size	13434	22.20	22.07	1.189	17.81	27.55
lev	13434	0.416	0.409	0.258	0.00800	20.25
sc10	13434	0.577	0.585	0.148	0.0880	1.012
sa	13434	-3.816	-3.818	0.255	-5.318	-2.736
lgkl	13434	12.63	12.62	0.890	4.835	17.66

From Table 1, it can be seen that the mean level of high-quality development in enterprises is 6.640, the median is 6.572, and the standard deviation is 0.773. This indicates that the high-quality development level of manufacturing enterprises in China is relatively good, but there is a certain gap between enterprises. The mean of intermediate goods trade liberalization is 2.035, the median is 2.092, and the standard deviation is 0.509, suggesting a relatively high degree of intermediate goods trade liberalization with a low level of data dispersion and overall minimal fluctuation. However, there are some differences in the level of intermediate goods trade liberalization among various industries.

3.2 Relevance Analysis

Table 2. Relevance analysis.

	tfpop	intetT	age	size	lev
tfpop	1				
interT	-0.135***	1			
age	0.297***	-0.302***	1		
size	0.744***	-0.134***	0.320***	1	
lev	0.011*	0.00400	0.016***	-0.013**	1
sc10	0.076***	0.043***	-0.248***	-0.036***	-0.032***
sa	-0.280***	0.176***	-0.881***	-0.286***	0.055***
lgkl	0.291***	-0.196***	0.194***	0.369***	0.119***
	sc10	sa	lgkl		
sc10	1				
sa	0.234***	1			
lgkl	-0.097***	-0.192***	1		

Table2 presents the results of the correlation analysis table used in Stata to test the linear relationship between variables in the sample. From the table, it can be seen that the correlation coefficient between total factor productivity (tfpop) and intermediate goods tariff (InterT) is -0.135, and both are significant at the 1% level of correlation. Therefore, it can be preliminarily predicted that there is a significant negative correlation between total factor productivity (tfpop) and intermediate goods tariff (InterT) in manufacturing enterprises, indicating that trade liberalization can promote the high-quality development of manufacturing enterprises.

3.3 Multiple Regression Analysis.

Table 3. Multiple regression analysis.

	（1）	（2）	（2）	（3）	（5）	（6）	（7）
Variable	tfpop	tfpop	tfpop	tfpop	tfplp	tfpop	tfpop
interT	-0.057***	-0.046**	-0.048**	-0.024	-0.042**	-0.069***	-0.055***
	(0.022)	(0.018)	(0.024)	(0.018)	(0.018)	(0.017)	(0.017)
age		0.132***	0.099*	0.133**	0.173***	0.010	-0.008
		(0.033)	(0.053)	(0.053)	(0.033)	(0.029)	(0.032)
size		0.600***	0.413***	0.432***	0.766***	0.399***	0.412***
		(0.007)	(0.009)	(0.010)	(0.007)	(0.008)	(0.008)
lev		-0.039***	-0.030**	-0.069**	-0.027**	-0.028*	-0.059*
		(0.013)	(0.015)	(0.035)	(0.013)	(0.016)	(0.033)
sc10		0.017	0.039	0.035	0.014	0.027	0.098**
		(0.038)	(0.048)	(0.058)	(0.037)	(0.042)	(0.046)
sa		-0.204***	-0.264***	-0.309***	-0.164***	-0.397***	-0.258***
		(0.053)	(0.069)	(0.074)	(0.053)	(0.046)	(0.051)
lgkl		-0.219***	-0.028***	-0.022**	-0.086***	-0.011	-0.002
		(0.006)	(0.007)	(0.009)	(0.006)	(0.007)	(0.007)
L.interT			-0.043*				
			(0.024)				
L2.interT				-0.076***			
				(0.018)			
_cons	5.993***	-3.343***	-3.562***	-4.017***	-6.138***	-3.496***	-3.441***

	(0.056)	(0.235)	(0.316)	(0.270)	(0.234)	(0.180)	(0.199)
N	13434.000	13434.000	10704.000	8558.000	13434.000	11809.000	8392.000
r2	0.329	0.623	0.461	0.396	0.728	0.764	0.433
r2_a	0.214	0.558	0.352	0.249	0.681	0.733	0.351
id	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes

By comparing the table 3 (1) and 3 (2), it can be clearly observed that, regardless of whether control variables are included, the research results consistently indicate that the impact of intermediate goods tariffs on the total factor productivity of enterprises is significantly negative. The significance level reaches 1%, indicating that trade liberalization can promote high-quality development of enterprises.

3.4 Endogeneity Test

To address the endogeneity issue that may lead to reciprocal causation relationships, this study employed lagged explanatory variables for regression analysis[7]. The regression results are shown in table 3(3) and 3(4) . When the explanatory variables are lagged by one period, the relationship between intermediate goods tariffs and the high-quality development of manufacturing enterprises remains significantly negative at the 10% level. When lagged by two periods, the relationship between intermediate goods tariffs and the high-quality development of manufacturing enterprises still remains significantly negative at the 1% level. This indicates that there is no endogeneity issue causing reciprocal causation between the explanatory and dependent variables.

3.5 Reliability Testing

Replace the defined variable. Table 3(5) presents the regression results after replacing the explanatory variable. The research findings indicate that the coefficient of interT remains significantly negative at the 5% level, suggesting that the regression results remain robust after changing the measurement method of the explanatory variable.

Shorten the corporate sample. There are two methods is adopted to reduce the sample size of enterprises. The first method is exclude enterprises with a survival period of less than 5 years; the second method is construct a balanced panel.The results are shown in Table 3(6) and Table 3(7). The results indicate that the regression coefficient of intermediate goods tariffs in the industry remains significantly negative, further confirming the robustness of the conclusion that trade liberalization promotes the high-quality development of enterprises.

4 CONCLUSIONS

Through theoretical and empirical analysis, the conclusion can be drawn.Tariffs on intermediate goods have a negative impact on the total factor productivity of enterprises, meaning that trade liberalization can promote the high-quality development of businesses. Trade liberalization reduces the cost for enterprises to access technology and

resources, enabling them to expand channels for acquiring high-quality resources. Trade liberalization expands market space, increases market competition pressure on enterprises.Enterprises need to improve product quality and technological innovation, enhance international competitiveness further achieve high-quality development.

Therefore, the government should continue to promote trade liberalization, reduce import tariffs, optimize the trade environment, and provide a more relaxed external environment for enterprises to develop in high quality; Enterprises should actively respond to the challenges and opportunities brought by trade liberalization. Enterprises need to continuously innovate, improve the technological content and added value of products, strengthen brand building, enhance product competitiveness and market share, and achieve high-quality development.

PROJECT

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