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THE IMPACT OF TRADE POLICY UNCERTAINTY ON THE QUALITY OF CHINA'S MANUFACTURING EXPORTS: AN EMPIRICAL STUDY BASED ON CHINA'S EXPORTS TO THE UNITED STATES

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Abstract: Previous studies believe that the decline in trade policy uncertainty will lead to a decline in the quality of export products, mainly because the decline in trade policy uncertainty is mainly reflected in the decline in tariff levels, so that enterprises that produce a large number of low-quality products are easier to enter the export market, but China's medium and high-tech products even in the case of tariff decline, due to weak competitiveness, so the export quantity is relatively small, so the overall average quality of export products declines. This paper uses China's export trade with the US manufacturing industry from 2000 to 2013 as the object, uses the double difference method to verify the impact of trade policy uncertainty on China's manufacturing products, and deeply explores the differences in manufacturing at different technology levels. The study finds that, unlike previous studies, this paper finds that the decline of trade policy uncertainty is conducive to the improvement of manufacturing export product quality, mainly because fierce market competition will force the manufacturing industry to improve the quality of export products, and the study also finds that the decline of trade policy uncertainty mainly promotes the improvement of product quality of low-tech manufacturing products, and has little impact on the manufacturing industry with medium and high technology levels.
Keywords: Trade policy uncertainty; Manufacturing exports; Product quality

1. INTRODUCTION

As a pillar industry of China's economic development, the development of manufacturing industry has maintained a good trend. After China's accession to the WTO in 2001, the external trade environment it faced has been greatly improved, and the stability of the external trade environment has greatly increased the export of China's manufacturing products, and the export trade volume has also risen rapidly. In 2000, China's manufacturing exports were only 1,851. 878 billion yuan, and by 2020, this data will increase to 1,225,429 million yuan, with an average annual growth rate of nearly 15.6%. However, in recent years, with the impact of trade protectionism and nationalism that has made the international trade environment unstable, the wave of "anti-globalization" is unstoppable, which has significantly increased the uncertainty of trade policies faced by China's manufacturing industry. Figure 1 is China's monthly trade policy uncertainty index from 2001 to 2020, from the figure it can be seen that since China's accession to the WTO, although China's trade policy uncertainty index has fluctuated, but overall downward trend, but in recent years, under the influence of Sino-US trade war and other events, the trade policy uncertainty index has risen sharply and the upward trend is obvious.

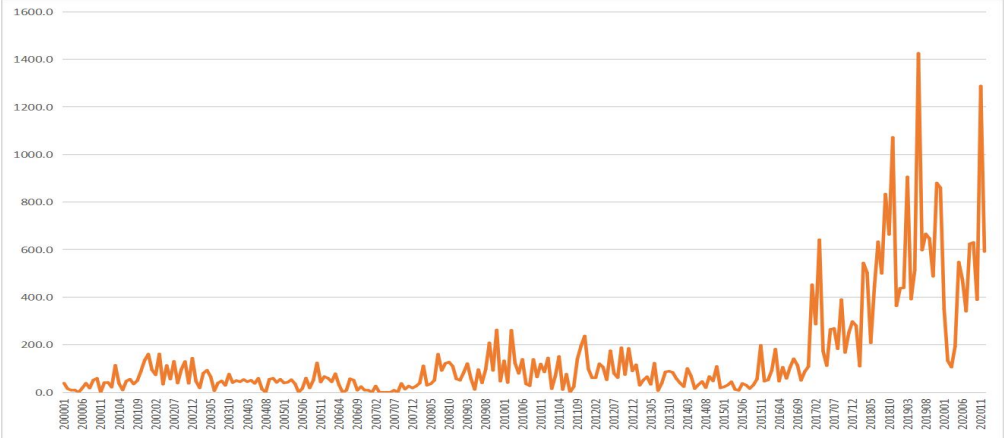

Figure 1 China's Monthly Trade Policy Uncertainty Index from 2001 to 2020

The instability of the trade environment will have a great impact on China's export trade, and manufacturing products, as the most important products in export trade, are the most affected by changes in the external trade environment. In recent years, countries have put forward obvious plans for the development of the manufacturing industry, such as the "German Industry 4.0 Plan" and the "Made in China 2025 Plan", all of which show the importance of manufacturing competition in the future. Looking at the development of China's manufacturing industry, it is mainly based on the development model of "low quality and low price", but the quality of products is far inferior to developed countries, and product quality has always been China's short board. Although China's manufacturing product exports have maintained a relatively high rate of growth, it is not difficult to find that it mainly relies on the huge export quantity rather than quality, coupled with China wants to move from a large trading country to a trading power, not only to have a strong ability to respond to uncertain changes in external trade policies, but also to have high-quality export products, only in this way can we occupy a place in the increasingly competitive export market. Based on this background, this paper analyzes the impact of changes in the foreign trade environment on the quality of China's manufacturing products after China's accession to the WTO, and hopes to find out the relationship between trade policy uncertainty and manufacturing export product quality through research, so as to find out the ways to improve the export quality of China's manufacturing products under the unstable external trade environment and give corresponding suggestions.

2. REVIEW OF RELEVANT RESEARCH

One type of literature relevant to this paper is on trade policy uncertainty. At present, academic research on trade policy uncertainty mainly focuses on trade volume, trade prices, profits, and product innovation. On the study of trade policy uncertainty and trade volume, Handley and Limao analyzed the impact of the decline in trade policy uncertainty on the overall trade volume after China's accession to the WTO [4], and found that 30% of the increase in China's exports to the United States during this period was caused by the decline in trade policy uncertainty after China's accession to the WTO. According to their calculations, this effect is equivalent to a 5 point reduction in the actual tariff of the United States on China. Feng, Li and Swenson based on Handley and Limao studied the impact of the decline in trade policy uncertainty on trade intensity and breadth after China's accession to the WTO, and found that after the decline in trade policy uncertainty, China mainly promoted exports to the United States through the extension margin, and Carballoetal and others reached similar conclusions in their studies of other countries [1,2,4]. Qian Xuefeng and Gong Lianmei found different conclusions in their research on China's accession to the Regional Comprehensive Economic Partnership (RECP) and the Trans-Pacific Partnership, and they used data analysis from 2005 and 2010 to find that China's manufacturing export promotion was mainly done by relying on intensive margins [13]. Regarding the impact of trade policy uncertainty on trade prices and profits, Handley and Limao found that as trade policy uncertainty declines, the price of Chinese exports to the United States also falls, because the decline in trade policy uncertainty

helps enterprises to innovate production technology, improve production efficiency, and thus reduce the price of products [4]. Wang Yanan studied the impact of trade policy uncertainty on the profits of export enterprises through relevant data from China Customs, and found that the decline in trade policy uncertainty has a positive and significant impact on profits in both the short and long term[20]. Regarding the impact of trade policy uncertainty on trade product innovation, Tong Jiadong and Li Shengqi found that the product innovation ability of Chinese export enterprises is also significantly improved in the process of declining trade policy uncertainty, and the research also found that this effect mainly has a more obvious impact on foreign-funded enterprises and processing trade enterprises[19].

Another type of literature relevant to this article is research on the quality of export products. In terms of export product quality, the academic community mainly focuses on the measurement of export product quality and the influencing factors of export product quality. In terms of measuring the quality of export products, Hallak and Li Kunwang used the unit value of export products to measure the quality of export products [3,11], while Hausmann , Li Huijuan and Li Hong believe that the level of technology can directly reflect the quality of export products, and they measure the quality of export products by measuring the technical complexity of export products[5,8,10]. Khandelwal et al. and Shi Bingzhan measure the quality of export products by inference of demand information. In terms of influencing factors, Shi Bingzhan believes that R&D efficiency, market competition and financing will have an impact on the quality of export products [6,16]. Shen Kunrong et al. found that the stock of physical capital and the level of R&D have a significant impact on the quality of export products, but the role of human capital cannot be determined [9].

The most closely related literature to this paper is the study on the impact of trade policy uncertainty on the quality of export products. At present, there are different views in the academic community on the impact of trade policy uncertainty on the quality of export products. Su Limei et al. studied the impact on China's product quality under the background of the most favored nation status granted to China by the United States after China's accession to the WTO from the perspective of the decline in trade policy uncertainty, and they found through the relevant data from 2000 to 2006 that the decline in trade policy uncertainty will lead to the decline in the quality of China's export products, mainly because the decline in trade policy uncertainty makes a large number of enterprises producing low-quality products enter the export market, but they cannot make adjustments in the short term[17]. But Feng et al came to a completely different conclusion, finding that when trade policy uncertainty declines, many new firms enter the export market, their export products are high, and the greater the decline in trade policy uncertainty, the higher the quality of export products[2]. Sun Lin et al. also came to the same conclusion, they found that although the decline in trade policy uncertainty has a significant impact on the improvement of China's export product quality, the impact on enterprises of different ownership systems and different regions is different[18]. On the regional front, the decline in trade policy uncertainty has the most significant effect on the eastern region. Wang Mingtao et al. also take the China-ASEAN Free Trade Area as the background, but they cannot change the measurement of trade policy uncertainty, and conclude that the reason why the decline in trade policy uncertainty will improve the quality of export products is that fierce market competition will force enterprises to improve the quality of their products[21].

According to the above research, the decline in trade policy uncertainty will make competition more intense, and it is easier for export companies to improve product quality through learning effects. In addition, the new trade theory also shows that only enterprises with high production efficiency can gain a foothold in the export market, and the production efficiency of export products is positively correlated with the quality of export products [7].

The possible marginal contributions of this paper are: (1) different from the tariff differential method to measure trade policy uncertainty, this paper draws on the measurement idea of environmental uncertainty faced by enterprises to measure trade policy uncertainty through the fluctuation of industry export value, and the results measured by this method also consider the impact of tariffs, non-tariff barriers, political shocks and international economic fluctuations[14]; (2) Previous literature mainly studies the impact of trade policy uncertainty on the quality of manufacturing export products from the macro or micro level, while this paper analyzes the impact of trade policy uncertainty on export product quality from the perspective of meso industry. (3) It enriches the research content on the

impact of trade policy uncertainty on the quality of manufacturing export products.

3. INDICATOR MEASUREMENT, MODEL SETTING AND DATA DESCRIPTION

3.1 Estimation of Trade Policy Uncertainty

For the measurement of trade policy uncertainty, the academic community mainly adopts the tariff gap method. Most scholars refer to Handley and Limao for the formula of trade policy uncertainty derived under the conditions of monopolistic competition. Although this method is easy to operate[4], it usually yields smaller values than true values because trade policies also include factors such as political fluctuations and non-tariff barriers. In view of the shortcomings of the tariff differential method, this paper draws on Wang Mingtao and Xie Jianguo to measure the uncertainty of US trade policy towards China using fluctuations in industry export volume[21]. Although this method takes into account all policy factors other than tariffs, it also includes other factors, and in order to make the calculation more accurate, we first establish the following model to exclude the impact of other factors on the export value, and use this as a basis for subsequent calculations. The specific model is as follows:

$$\ln chexport_{it} = \beta_0 + \beta_1 lp_{it} + \beta_2 \ln employment_{it} + \beta_3 \ln wage_{it} + \beta_4 \ln chinagdp_t + \beta_5 \ln pcgdp_t + \beta_6 \ln quality_{it} + \beta_7 \ln exchange_t + \varepsilon_i + \varphi_t + \phi_{it}$$

Among them, $lnlp_{it}$ refers to the labor productivity of the manufacturing sub-industry i in t years, and high production efficiency is generally positively correlated with high quality in the new trade theory, and this paper is expressed by dividing the output value of the subdivided industry by the logarithm of the number of employed people in the subdivided industry; $chexport_{it}$ represents the export value of China's manufacturing sub-industry i to the United States in T year; $lnemployment_{it}$ is the logarithmic value of the number of employment in the manufacturing sub-sector i in year t, which indicates the size of the industry, and the new trade theory believes that larger enterprises are also lower than competitors due to the existence of scale effects, which is conducive to their exports. LNWAGEIT is the logarithmic average wage in the manufacturing segment; lnchinagdpt represents the logarithmic value of the average GDP of the Chinese in t year, which can reflect the supply capacity of products to a certain extent; lnpcgdpt represents the logarithmic value of GDP per capita of the importing country, indicating its level of demand; $lnquality_{it}$ indicates the quality of the products exported by the manufacturing sub-industry I in t year, because the export quantity of many products is missing, so this paper uses the manufacturing manufacturing quality competitiveness index instead; LNEXCHANGET represents the logarithmic value of the exchange rate of the renminbi against the US dollar. εi stands for industry effect, φt represents year effect, and Φit is the residual term. Export data from UNcomtrade database, industry output value, number of employed people and wages are taken from China Statistical Yearbook, China Industrial Statistical Yearbook and China Labor Statistics Yearbook; Per capita GDP between China and the United States is measured in constant 2015 dollars in WDI databases. Exchange rates are derived from the IMF database.

The specific calculation method is: first, the above model is estimated by ordinary least squares method (OLS), so as to obtain the residual value of different years of the manufacturing sub-industry; Secondly, the average standard deviation of export residual in China's pre-WTO and post-manufacturing sub-sectors was calculated as aBEFORE(SDI) and AAFTER(SDI), respectively. Finally, the uncertainty of trade policy at the manufacturing level is measured by the difference between the average of the standard deviations of export residual before and after China's accession to the WTO, that is, TPU = abefore(sdi)-aafter(sdi), the larger the TPU indicates that the greater the decline in trade policy uncertainty after China's accession to the WTO, otherwise it means that the uncertainty of trade policy changes less before and after China's accession to the WTO.

According to the above method, the value of the trade policy uncertainty index after China's accession to the WTO is calculated, as shown in Table 1.

Table 1 Trade uncertainty index of manufacturing segments

Industry code	Industry name	TPU
15	Liquor, beverage and refined tea manufacturing	0. 252
17	Textiles	0. 294
18	Textile and garment, clothing industry	0. 521
21	Furniture manufacturing	0. 635
25	Oil, coal and other fuel processing industries	0. 582
26	Chemical raw materials and chemical products manufacturing	0. 078
27	Pharmaceutical manufacturing	0. 359
28	Chemical fiber manufacturing	0. 486
30	Non-metallic mineral products industry	0. 658
31	Ferrous metal smelting and rolling processing industry	0. 378
32	Non-ferrous metal smelting and rolling processing industry	0. 412
33	Metal products industry	0. 488
34	General equipment manufacturing	0. 512
35	Special equipment manufacturing industry	0. 461
37	Railway, shipbuilding, aerospace and other transportation equipment manufacturing	0. 365
38	Electrical machinery and equipment manufacturing	0. 571

3.2 Measurement Model Setting

This paper regards China's accession to the WTO as an exogenous shock event, further studies the impact of trade policy uncertainty changes on the export quality of China's manufacturing products, and constructs the following multiplier measurement model:

$$quality_{it} = \beta_0 + \beta_1 TPU_{it} * Post_{2001} + \beta_2 X_i + \delta_i + \phi_t + \varepsilon_{it}$$

Among them, i represents China's manufacturing sub-industry, and t represents the year; QualityIt indicates the quality of the products of the industry i exported by China to the United States in the t year; TPUit is the trade policy uncertainty index of the industry in the year t, because the TPUit in the manufacturing industry is very different, the reference [12, 21] the industry with a large decline in trade policy uncertainty is regarded as the treatment group (the decline in trade policy uncertainty is large), and the industry with a small decline in trade policy uncertainty is regarded as the control group (the decline in trade policy uncertainty is small). post2001 is a time dummy variable, taking China's accession to the WTO as the time point, taking 0 before 2001 and 1 after 2001; For the interactive term TPUit*Post2001 is the focus of our attention, the estimation coefficient β1 of the cross term represents the impact of the decline of trade uncertainty on the quality of manufacturing export products, and β1>0 indicates that the decline of trade uncertainty

promotes the quality of manufacturing export products; Xi is the set of all control variables; In order to reduce the impact of unobservable factors on the quality of manufactured exports, the industry fixed effect δi and the year effect Φt are set. β0 and εit represent constant and error terms, respectively.

3.3 Variables and Data

3.3.1 The measure of the explanatory variable

For the measurement of manufacturing export product quality, this paper mainly draws on Hausman and others by calculating the technical complexity of manufacturing product exports to measure[5], first through the 2000-2013 UNcomtrade database and WDI database to calculate the technical complexity of China's manufacturing sub-industries, the specific formula is shown below:

$$PRODY_{ijt} = \sum_n \frac{X_{ijt} / X_t}{\sum_n X_{ijt} / X_t} * pcgdp_{jt}$$

Among them, PRODYijt indicates the technical complexity of the products exported to country j by the manufacturing sub-industry i in the t year; Xijt/XT represents the proportion of exports of I industry products to the total exports of manufacturing products to country J in the t year; PCGDPJT represents the per capita GDP level of country J in year t, which is generally used to replace the per capita income level of country J, and the per capita GDP data of country J in this article comes from the World Bank and is measured in constant 2015 dollars.

3.3.2 Control the selection of variables

The scale of the industry (lnlabor), the larger the scale of the industry, the more likely it is to form economies of scale, which will reduce the average cost of products in the industry, and further allow enterprises in the industry to invest in technology research and development and the introduction of more advanced machines to improve the quality of products, this article will use the average number of workers in the industry to measure the size of the industry, the data is from the "China Labor Statistics Yearbook", the unit is people, the expected sign is positive.

The wage level (lnwage) of the industry is generally higher for high-skilled workers, and the level of wages can also reflect the management ability of workers[21]. Higher wages can recruit higher levels of labor, which is conducive to improving the quality of manufacturing export products, this article will use the average wage of subdivided industries to represent the wage level of the industry, the data from the "China Industrial Statistics Yearbook" and China's "Labor Statistics Yearbook", the unit is yuan, the expected sign is positive.

R&D level (lnRD), R&D investment has a significant impact on product quality, generally through technological innovation can improve the quality of products, this paper will use R&D internal expenditure of industries above designated size to represent the level of R&D, and in order to make the empirical results more accurate, it will be logarithmic, and the source of the data is "China Science and Technology Statistical Yearbook", the unit is yuan, and the expected sign is positive.

The degree of openness of the industry (lnopen), the degree of openness of the industry can reflect the quality of the industry's products. Generally speaking, the higher the quality of the industry's export products, the greater the market share in the international market, the higher the degree of openness of the industry, this article uses the logarithm of the export volume of the export product to indicate the degree of openness of the industry, and the data comes from the UNComtrade database, the unit is yuan, and its symbol is positive.

3.3.3 Data description and processing

In 2013, China became the world's largest country in the import and export of goods, and after becoming a major trading country, many scholars were worried about China's way of relying on low-quality products, and thus proposed to develop product quality from a trading country to a trading power. In this context, the quality of manufacturing

export products has also developed rapidly, but with Brexit and Sino-US trade frictions have hindered the improvement of the quality of China's manufacturing export products, and then consider the availability of data, this paper selects the data from 2000 to 2013 to analyze the impact of China's accession to the WTO on the quality of China's manufacturing export products.

First of all, the data taken in this paper mainly come from China Statistical Yearbook, China Industrial Statistical Yearbook, China Science and Technology Statistical Yearbook, World Bank WITS Database and United Nations UNComtrade Trade Database, etc. , secondly, for the relevant treatment of subdivided industries, this paper refers to the method of Sheng Bin to match the classification of national economic industries with the International Trade Classification Standard (SITC) [15], which mainly combines national economic industries (GB/T4754-2002) Matching with the International Trade Classification Standard SITC (Rev.2) yields relevant data, the main variable description statistics are shown in Table 2 below.

Table 2 Descriptive statistical results for variables

Variable	Number of samples	Mean	Standard deviation	Minimum	Maximum
logquality	224	12. 714	0. 06	12. 613	12. 819
tpupost	224	0. 378	0. 206	0	0. 658
loglabor	224	14. 492	0. 843	11. 918	15. 943
logwage	224	9. 89	0. 563	8. 764	11. 012
logRd	224	22. 892	1. 401	17. 708	25. 327
logopen	224	21. 477	1. 751	15. 927	24. 214

4. EMPIRICAL RESULTS AND ANALYSIS

4.1 The Impact of Trade Policy Uncertainty on the Quality of Export Products

This part is based on the relevant data of 16 sub-industries in the manufacturing industry from 2000 to 2013, and establishes a static panel data model to analyze the impact of the decline in trade policy uncertainty on the quality of China's manufacturing export products. The model is estimated by gradually introducing control variables, and the specific estimation results are summarized in the following table: no control variables are added to column (1), but industry fixed effects and year fixed effects are considered and used as benchmark regression results. When the control variables such as industry scale, industry wage level and industry openness are introduced, and the industry fixed effect and year fixed effect are controlled at the same time, it is found that the results in columns (2), (3) and (5) are still positive and significant, which is in line with the expected results. However, after joining the R&D level of the industry, it was found that the symbol at this time was negative but still significant, contrary to the assumed expected sign, and in-depth analysis can find that the main reason is that most of the R&D expenditure invested at that time mainly flowed to labor-intensive industries with comparative advantages at that time, and the product quality of these industries was low, which led to an increase in R&D expenses and a decline in the quality of the industry's export products.

Table 3 Benchmark regression results

Variable	(1)	(2)	(3)	(4)	(5)
	logquality	logquality	logquality	logquality	logquality

tpupost	0. 154***	0. 139***	0. 022***	0. 015***	0. 014***
	(22. 67)	(14. 97)	(5. 03)	(3. 70)	(3. 35)
loglabor		0. 009**	-0. 000	0. 005***	0. 005***
		(2. 38)	(-0. 15)	(3. 47)	(3. 79)
logwage			0. 050***	0. 049***	0. 046***
			(38. 73)	(41. 87)	(32. 85)
logRD				-0. 006***	-0. 006***
				(-6. 35)	(-6. 39)
logopen					0. 003***
					(3. 36)
Constant terms	12. 651***	12. 528***	12. 173***	12. 245***	12. 220***
	(4013. 44)	(242. 44)	(616. 14)	(573. 73)	(550. 94)
Industry effects	yes	yes	yes	yes	yes
Year effect	yes	yes	yes	yes	yes
Observations	224	224	224	224	224

Note: ( ) is the value of the statistic, and *, **, and **** refer to significant at the 10%, 5%, and 1% levels, respectively

4.2 Distinguish Heterogeneity Regression at the Technical Level

For different manufacturing industry segments, the impact of trade policy uncertainty changes is not exactly the same, in order to further analyze whether there is a difference in the impact of trade policy uncertainty changes on different manufacturing industry segments, this paper according to the national economic industry 2-digit classification standard, the 16 manufacturing sub-industries according to the OECD for the division of technical levels to group, the specific results are shown in the following table, the results show that trade policy uncertainty for the decline of high, The quality impact of medium manufacturing products is not obvious, the reason is that in the period from 2000 to 2013, China mainly relies on the export of low-tech manufacturing products characterized by labor-intensive, and the high-tech and medium-tech manufacturing industries have a low level of development at that time and export competitiveness is poor, so the uncertainty of trade policy changes has no obvious impact on it, but low-tech manufacturing as the main object of exports. When the uncertainty of trade policy declines, it will lead to the influx of other developing countries into the international market and improve their competitiveness, so China's low-tech industries are forced to improve the quality of their products to improve product competitiveness.

Table 4 Manufacturing industry estimates by technology layer

Variable	(1)	(2)	(3)
	HT	MT	LT
tpupost	0. 080	0. 002	0. 017**

	(0. 95)	(0. 29)	(2. 49)
loglabor	0. 007	0. 003	0. 005**
	(0. 14)	(1. 14)	(2. 17)
logwage	-0. 312**	0. 052***	0. 047***
	(-3. 35)	(17. 48)	(20. 35)
logRD	-0. 013	-0. 008***	-0. 005***
	(-0. 57)	(-5. 12)	(-4. 05)
logopen	0. 259**	-0. 000	0. 003***
	(2. 58)	(-0. 23)	(3. 08)
Constant terms	9. 918***	12. 314***	12. 201***
	(10. 33)	(269. 49)	(376. 64)
Industry effects	yes	yes	yes
Year effect	yes	yes	yes
Observations	14	70	140

Note: ( ) is the value of the statistic, and *, **, and **** refer to significant at the 10%, 5%, and 1% levels, respectively

4.3 Robustness Regression

In order to make the regression results more reliable, the following methods will be used to test robustness.

First of all, because the uncertain changes in trade policies will make the trade environment unstable, so companies need to consider more factors in entering the export market, at this time, some companies with low production product quality can not profit in the world market because of their low product competitiveness, in order to change this situation, these companies can only improve product quality to enhance product competitiveness and profit in the world market. On the contrary, when the quality of the product is improved, its competitiveness in the world market is also strong, which is easy to cause a trade surplus, which will cause retaliation from other countries and further trigger uncertain changes in trade policies. Therefore, the first-order lagged term of export product quality is used as a tool variable for robustness analysis, and the regression results are shown in column (2) of the table, and the results are consistent with the benchmark regression results in column (1), that is, the decline of trade policy uncertainty is conducive to the improvement of manufacturing export product quality, indicating that the regression results are robust.

Second, change the way the trade policy uncertainty index is measured. The measurement of trade policy uncertainty in this paper is very different from the traditional method, and the measurement of trade policy uncertainty in this paper refers to the method of Wang Mingtao and Xie Jianguo [21], while the academic measurement of trade policy uncertainty mainly adopts the difference method, so this paper will draw on the method of Pielec and Schott to remeasure trade policy uncertainty, and the regression results obtained are shown in column (3) of the table. The regression results show that the trade policy uncertainty index is positive, that is, the decline of the trade policy uncertainty index is conducive to the improvement of manufacturing export product quality, which indicates that the main conclusions drawn in this paper are reliable[12].

Table 5 Robustness regression results

Variable	(1)	(2)	(3)
	Model1	Model2	Model3
tpupost	0. 014***	0. 017***	0. 006***
	(3. 35)	(2. 97)	(1. 34)
loglabor	0. 005***	0. 001	0. 03***
	(3. 79)	(0. 80)	(2. 68)
logwage	0. 046***	0. 037***	0. 048***
	(32. 85)	(20. 97)	(32. 63)
logRD	-0. 006***	-0. 001	-0. 007***
	(-6. 39)	(-0. 72)	(-7. 29)
logopen	0. 003***	0. 002***	0. 003***
	(3. 36)	(2. 69)	(3. 24)
Constant terms	12. 220***	12. 268***	12. 205***
	(550. 94)	(652. 99)	(479. 83)
Industry effects	yes	yes	yes
Year effect	yes	yes	yes
Observations	224	208	224

Note: ( ) is the value of the statistic, and *, **, and **** refer to significant at the 10%, 5%, and 1% levels, respectively

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Main Conclusions

This paper uses the data of China's manufacturing exports to the United States from 2000 to 2013 to analyze the impact of declining trade policy uncertainty on the quality of manufacturing export products, and concludes the following:

Since China's accession to the WTO in 2001, the uncertainty of trade policy has been declining, which makes China's manufacturing export products face more fierce competition, but the decline in trade policy uncertainty is beneficial to the overall development of China's manufacturing industry, because it forces China's manufacturing industry to improve the quality of its own products, thereby improving the international competitiveness of products in the international market.

For industries at different levels of technology, the impact of reduced trade policy uncertainty is also different. According to the results of the heterogeneity regression of distinguishing the technical level, the low-tech level manufacturing industry is more affected after the decline in trade policy uncertainty, mainly because China's export of manufacturing products is mainly of this type, because the high-level level of manufacturing because of its own poor competitiveness in the international market, even if the uncertainty of trade policy declines, it is difficult to compete with developed countries in the international market.

5.2 Policy Recommendations

Based on the main conclusions drawn above, this paper makes the following policy recommendations:

First, the decline in the uncertainty of external trade policies has a promoting effect on the overall quality of China's manufacturing export products, so China must not only make good use of the free trade agreements that China has signed, especially the RCEP agreement that only came into effect this year, and use the RCEP agreement to accelerate the pace of establishing free trade agreements with Japan and South Korea as much as possible, but also to actively establish free trade agreements with other countries, so as to reduce trade policy uncertainty and promote the improvement of the quality of China's manufacturing export products.

Second, strengthen support for the development of high- and medium-tech manufacturing industries. As the world's largest country in goods trade, China should not only continue to maintain and consolidate the competitive advantages it had in the past, but also accelerate the cultivation of new advantages in international competition. Through the analysis of the heterogeneity of the technical level in this paper, it can be found that in the past, China mainly relied on primary production factors such as labor and resources to establish competitive advantages, but in order to move from a large trading country to a trading power, we should adjust the industrial structure, optimize the industrial layout, and support the development of high value-added industries. Specifically, the government should increase support for high- and medium-tech manufacturing industries, and provide certain subsidies and tax exemptions and other corresponding policies for high- and medium-tech manufacturing industries, so as to encourage high- and medium-tech manufacturing industries to increase investment in scientific and technological research and development, and provide strong conditions for the improvement of product quality in high- and medium-tech manufacturing industries.

Third, strengthen the guidance of R&D expenses in the manufacturing industry. This paper finds that the reason why the increase in R&D expenses leads to the decline in export product quality is that the input-output ratio obtained by capital investment in high-, medium-, and low-tech manufacturing industries is very unbalanced in the short term, and the investment cycle of high- and medium-tech manufacturing industries is long and risky, and the investment cycle of low-tech manufacturing is short and has good returns in the short term. Therefore, the government should strengthen the guidance of R&D funds, so that high- and medium-tech manufacturing industries can obtain sufficient R&D funds, so as to play its role in driving the quality of manufacturing export products.

Finally, the data used in this paper from 2000 to 2013 have certain limitations in terms of timeliness, and the processing of missing data and the selection of related data need to be further improved, so it is not possible to accurately analyze the problems studied in this paper.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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