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Measurement and Analysis of Bilateral Costs between China and Trading Partners Based on the Revised Gravity Model

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MEASUREMENT AND ANALYSIS OF BILATERAL COSTS BETWEEN CHINA AND TRADING PARTNERS BASED ON THE REVISED GRAVITY MODEL

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Abstract

A revised gravity model has been adopted in the thesis to measure the changes of bilateral trade costs of China and other 28 countries during 1992～2007.The results are as follows: China's trade costs take on a declining trendand the bilateral trade costs between China and developed countries is lower than that of developing countries. As the trade costs between China and major trading partners take on a declining trend, which even has room for further decline, the major policy significances in this thesis are that China shall continue to excavate the way to reduce the trade costs in order tofurther enhance the export competitiveness.

Key words: trade costs, gravity model, cost measurement

1.Forewords

Trade cost is also called transaction cost, which includes all the costs for delivering the products to the ultimate consumers. As is well known, the decrease of transaction costs will enhance the degree of specialization of economic entities, increase the transactions between the entities, extend the market scale and increase the varieties of the products. On the contrary, if the transaction costs are too high, the transactions between the companies will decrease. In case the transaction costs are infinitely large up to the limit, no transactions will take place between any two companies in two countries. Currently, trade costs widely exist in international trade under the tides of global economic integration. The level of trade costs has been a decisive factor in determining whether the trade transactions will take place or not. To explore and measure the trade costs of a country can not only reveal its degree of integration into the world economy and its international competitiveness, but also have practical significance for a country's trade policy.

Since the adoption of the reform and open policies, China has made a remarkable progress in foreign trade. During 1980～2007,China's cargo export volume grows at an annual average rate of 25.62%,which is 18.32% higher than the world's average growth rate in cargo export volume during the same period and the average contribution rate of it to the GDP growth achieves 27% , which is also 10.15% higher than the average level of all the developing countries.(It is calculated according to the calendar year of "China Statistical Yearbook"and the World Trade Organization) The constant economic growth of China in the past 30 years obviously benefits from the rapid growth of the foreign trade. However, we have noticed that some problems have been caused by the rapidly developing trade pattern of China: Chinese enterprises rival with each other to participate in the work division system of global value chain through processing trade(processing on consignment or OEM) which is a trade pattern characteristic of low-tech, low added value and labor-intensive low-road manufacturing and assembly links.

This will inevitably bring about some problems such as the low exports value environmental pollution during manufacturing and increasing trade frictions etc.. Generally, what influence will such trade development bring to china? If China's trade development just relies on the increase of export quantity of local enterprises instead of improving the quality of the productivity of the enterprises, this kind of foreign trade is unsustainable, nor is the role it plays in driving the economic growth of China. Therefore, the measurement of China's trade costs under such background can not only provide direct evidence for the performance of China's foreign trade, but also be of vital importance for comprehending the pattern of trade and specialization China adopts in participating in the international division of labor. It has been an important subject of practical value and political connotations of China to make objective comments on the trade cost relations between China and the trading partners, and to discuss the interaction mechanism between them systematically. So The revised gravity model is adopted herein to measure and research the bilateral trade costs between china and 28 trade partners.

The structure of the remaining parts of the thesis is as follows: The second part is introduction to the international research background and the related research achievements, The third part is introduction to the empirical

methods and the data, while the forth part is presentation and analysis of the major calculation results, The fifth part is the summary.

2.Research Background and Literature Review

Issues related to cost are the primary issues in economics. Each significant development in economics is embodied in the development of cost, and each important economist has given its unique answer to issues related to cost in the history of economics. The cost of international division of labor and international trade consists of costs of resources reallocation and costs of transaction. The former refers to cost of converting the productive structure, which falls into the category of production and is the object of study in microeconomics; the latter falls into the category of circulation and is the object of study in international trade theories. From the perspective of the development history of international trade theories, scholars have carried out a detailed analysis of the benefits of international division of labor and international trade as well as issues related to production cost. However, they have not conducted a careful and systematic study of the transaction cost of international division of labor and international trade. Attention has been paid to the production cost very early in the international trade theory, but transaction cost has not been the major object of study in international trade theory all the time. Even if some scholars mention this question indirectly, they just skate over such issues with scattered elaborations.

Trade costs have been almost excluded in the conventional trade theory and trade model(Behrens etc.2007) [1]. Firstly, what conventional trade theory has always paid attention to is visible costs such as tariff and tariff barrier. On the one hand, the tariff data is available, which makes the empirical research easy to carry out. On the other hand, the cost of tariff is determined by the trade policy, which is an endogenous process of decision-making and provides an attractive subject for research. On the contrary, it will take much time and effort to obtain the data of the transportation cost, information cost and cost of contract performance etc.. What's more, some relative data may not be available at all. Secondly, the trade costs is very difficult to be incorporated into the normal form of perfect competition due to uncertainty leading to balance, which is the backbone of the trade theory. Finally, people generally believed that the different components of trade cost can be simplified into a single parameter (Samuelson, 1954) [2].

At present, trade costs have been a core concept in the trade theory. Melitz(2003) [3]founded the so-called New-new International Trade Theory with the critical assumptions of heterogeneity of manufacturers and sunk cost of export. It is the sunk cost of export that puts heterogeneity of manufacturers into play. In Krugman(1980,1991)'s theory of economic geography, trade costs is the key factor to comprehend the locational choice of enterprises and the concentration and spread of the space of economic activity [4][5]. Benard(2006) [6]have expanded a Single product company to Multi-product company, and every product has corresponding sunk cost of export so as to explain the export and production adjustment in the company.

Moreover, Helpman(2007) [7] holds that different sunk costs of export shall be paid to enter into different countries to explain zero trade and unilateral trade. Andersen and Wincoop(2004) [8] thought that trade costs is of vital importance, alsopointing out that trade costs is equal to 170% customs duties. Obstfeld and Rogoff(2000) [9] regarded the trade costs as the key to solve the mysteries of all the other open macroeconomics and noted that trade costs is the common answer to explain the 6 big doubts in the domain of international trade. Hummels(2001) [10] believed that trade costs played a core role in international specialization and the trade model and any experiential assessment involving international specialization and trade model may face trade costs finally. Kancs(2007) [11] divided the trade costs into variable trade costs and fixed export cost, holding that different trade costs have different influences on export growth. He inspected the influences caused by the invariable trade costs and the fixed export cost on the export growth of the countries of southeastern Europe under the frame of the heterogeneous trade model of the enterprises.

The importance of trade costs determines the necessity for measuring the trade costs. As for merchandise trade, trade costs consist of transportation cost (shipment cost and time cost),policy barrier(tariff and non-tariff barrier),information cost, the cost paid for guaranteeing contract performance, payment of overcoming the linguistic and cultural differences, expense spent in currency conversion and risk of exchange rate, cost of the law and control in importing countries and the distribution cost for wholesale and retail sales etc..

People have already reached the consensus about the importance of the trade costs, and recent research has supplied attracting clues. However, there are rare evidences about the nature, scale and structure of trade costs (Hummel,2001).How to measure trade costs is still confusing. At present, there are limitations in either measuring the trade

costs directly or indirectly. For example, direct measurement of the trade barriers. Although there are many indexes for direct measurement of the trade barriers such as the level of customs duty, the coverage ratio of each non-tariff barrier and the premium of exchange rate in black market etc., the nominal customs duties promised by various countries , especially the duties of manufacturing industry will be reduced greatly after multi-round bilateral and multilateral consultations. More and more countries have resorted to non-tariff barrier as the major means of trade protection. However, it is hard to quantify non-tariff barrier precisely and different kinds of non-tariff barriers have different restrictive effect. Each index has its own limitation in application and it is hard to draw a consentaneous conclusion for different means of measuring, which will affect the reliability and accuracy of the direct measurement. Therefore, researchers mainly measure the trade costs indirectly.

Most scholars adopt the gravity model to measure trade costs indirectly. Anderson (2003) has revised the traditional gravity model through adding the overall multilateral trade costs of both sides in the trade on the basis of the traditional regressive variable so that the bilateral volume of trade becomes the function of the economical scale and the relative trade costs[12] [13]. The basic form of the gravity model is as follows:

$$X_{ij} = a_1 y_i + a_2 y_2 + \sum_{m=1}^{m} \beta_m \ln(Z_{ij}^m) + \varepsilon_{ij} \quad (1)$$

X_{ij} is the log value of the export volume from country I to country j. Y_i and Y_j are the log value of the GDP in exporting country i and importing country j respectively, Z_{ij}^m is the proxy variable related to trade costs. ε_{ij} is disturbance Item.

McCallum(1995) [14] adopted this method to measure the trade between American and Canada, and found that the trade volume between the various provinces in Canada was 22 times as much as that between American various states and Canadian various provinces. Rose (2000) [15] inspected the influences of the monetary union on trade with this method, finding that the trade volume of countries using the same currency is 3 times as much as that of countries using different currencies. However, this method also has obvious limitations. Firstly, this method determines the basic components of trade costs beforehand, which is then put into the gravity model to carryout regression analysis. It will probably produce biased result for omitting variables(Novy,2006) [16].The research indicates that it is not enough to just use distance to represent the trade costs. Geraci and Prewo (1977) [17] found that just using distance to represent the trade costs will underestimate the sensitivity of the bilateral trade flow to the trade costs after studying the trade costs of countries in OECD. Limao and Venables(2001) [18] found out that distance explained merely 10% of the trade costs, which is nearly 50% lower after taking infrastructure into consideration. Secondly, the traditional gravity model lacks theoretical basis and we can't carry out comparative static analysis with it or to explore the effect after removing some trade barriers (Anderson and van Wincoop,2003). Finally, traditional gravity model does not take the influences of multilateral resistance into account. Generally, the bigger the trade resistance is from one region to all the other region, the more it will be propelled to trade with the given bilateral trade partners. That is to say trade between two regions depends on the relative magnitude of bilateral trade costs and the average cost between all the trade partners and them. After taking the influences of multilateral resistance into consideration, Anderson and van Wincoop(2003) estimated the McCallum(1995)'s regression equation with the American data, finding that the trade volume between the various provinces in Canada is only 1.5 times as much as that between American various states and Canadian various provinces.

Just because of the defects of traditional trade gravity model in measuring the trade costs, some economists have begun to try to amend and extend the traditional gravity model. They deduced the gravity model of micro-theoretical foundation Through the general equilibrium model, and they determined the trade cost afterwards instead of beforehand. and took the impact of multilateral resistance into account. Anderson and van Wincoop(2003) deduce the following forms of gravitational equations after taking a single-sector economy into consideration.

$$X_{ij} = \frac{Y_i Y_j}{Y_w} \left(\frac{T_{ij}}{P_i P_j} \right)^{1-\rho} \quad (2)$$

X_{ij} is export from country I to country j, Y_i and Y_j is GDP of country I and country j respectively; T_{ij} is iceberg trade costs, P_i and P_j is the price index, P is the elasticity of substitution. The key meaning of the equation is that the trade between two regions is determined by the relative trade costs. In the above equation the price index P_i and P_j represent the term of multilateral resistance. However, it is not an ideal method to use the price index to replace the multilateral resistance. Novy(2006) pointed out that

the comparative static analysis is invalid, for both production and consumption are exogenous in the model of Anderson and van Wincoop, and the changes in trade costs affect not only trade volume, but also affect production and consumption. In short, the current indirect methods of measuring trade costs are unsatisfactory and an improved method is expected. (Anderson and vanWincoop,2004).

The researches on trade costs of the domestic scholars mainly focus on two aspects: Li Kunwang and Huang Jiuli(2006) and Li Kunwang etc.(2006) estimated China's manufacturing industry and degree of freedom in the bilateral trade between China and its major trading partners through making use of the model of fixed effect and on the basis of the new economic geography model respectively, which has provided useful exploration for understanding the changes of China's trade openness. But the defect of the former lies in that it ignores the influences on bilateral trade costs by the multilateral resistance. The computational formula derived from the new economic geography model by the latter is over-simplified and they used a single parameters to cover all the trade barriers. Shi Bingzhan(2008)[19]and Qian Xuefeng, Wang Qi(2008) [20] have adopted the improved gravity model to measure the bilateral trade costs with its trading partners since 1980s respectively and revealed the downward trend in trade costs.

To conclude , these documents have provided a deep insight for us to understand the relationship between trade costs and the growth of trade, however, there are some shortcomings. First of all, most of the documents have directly adopted the traditional gravity model as the means of research, thus they fail to explain the mechanisms between the development of trade and trade costs clearly in theory. Secondly, most of the literature are on the basis of enterprise-level survey data in empirical studies,. However such data are hardly available, and even if the data are obtained, the conclusions may be not comprehensive due to the quantitative limitations of the samples.. Finally, as for the perspectives of research, no documents except Novy(2006) have separated the different effects on trade development by different trade costs, which is very important for choosing the developmental path of China's trade. Compared with the current research, the main contributions of this article are as follows: Such deficiencies can be made up for by referring to the improved gravity model provided by Novy(2006) and the bilateral trade costs between China and other 28 countries since China's reform and opening to the outside world have been measured comprehensively.. As shown in relevant studies, the bilateral trade costs of the tariff equivalent between China and other 28 countries has been less than 50% decreasing by 30% averagely compared with that in 1992.Particularly, the empirical research on China is favorable not only to understand the nature of China's trade prosperity and the meaning of welfare, but also to provide rich policy implications for choosing the path for the further development of China's foreign trade as well as the empirical evidences for the trade model of enterprise from large developing countries.

3.Empirical Methods and Data Sources

3.1. Novy model

Novy(2006) put forward a convenient and easy equation of gravity model through dividing the export commodities into tradable goods and non-tradable goods, extending the bilateral model to multilateral model, and integrating Samuelson(1954)'s iceberg type trade costs and Krugman(1980)'s framework of monopoly competition into the gravity trade costs. The equation is as follows

$$E_{ij}E_{ji} = s_i(Y_i - E_i)s_j(Y_j - E_j)(1-\tau_{ij})^{\rho-1}(1-\tau_{ji})^{\rho-1} \quad (3)$$

In the equation, E_{ij} and E_{ji} are the export from country I to country j and the export from country j to country I' respectively, E_i, Y_i and E_j, Y_j are country I and country k's total exports and GDP respectively, s_i and s_j are country j and country j's share of tradable goods respectively, τ_{ij} and τ_{ji} are the trade costs of the export from country I to country j' and that of the export from country j to country I respectively, ρ is the elasticity of substitution.

The above equation shows that if the bilateral trade costs τ_{jk} and τ_{kj} are very high, the bilateral trade E_{jk} and E_{kj} will drop; if the share of tradable goods are very low, the bilateral trade E_{jk} and E_{kj} will decline too. In the traditional gravity model, bilateral trade is only determined by the Y, but in the equation by $(Y_j - E_j)$ and $(Y_k - E_k)$. $Y_j - E_j$ represents the market potential actually, which is the potential tradable part of j's output that don't happen in fact.

If the potential of the bilateral market increases, the bilateral trade will also expand. What's more, the equation reflects the impact of multilateral resistance, and bilateral trade is determined by the level of bilateral trade costs corresponding to their average trade costs. For example, suppose that other

conditions remain unchanged, , if the average trade costs between j and the other country l (k≠l) decline, the actual total trade export E_j will increase and the bilateral trade will decrease between j and k. Therefore, the actual total export E_j and E_j E_k imply the average trade costs, which represents the multilateral resistance. As the data of the actual total export can be obtained directly, it avoids the problems caused by using the price index that can't be observed as the multilateral resistance in Anderson and Wincoop's model.

In addition, as both production and consumption are endogenous in Novy(2006)'s model, comparatively static analysis can be carried out effectively. In order to measure the trade costs easily, it is assumed that the bilateral trade costs is symmetric($T_{ij} = T_{ji}$) and the share of bilateral tradable goods is equal($s_i = s_j$).Then, we can easily obtain the computing formula of the trade costs:

$$\tau_{ij} = \tau_{ji} = 1 - \left[\frac{E_{ij} E_{ji}}{(Y_i - E_i)(Y_j - Y_j)s^2} \right]^{\frac{1}{2\rho - 2}} \qquad (4)$$

Obviously, if the bilateral trade increases, it means that it is easier for the two sidesto develop trade, and the trade costs will come down in case that other conditions remain unchanged, and if the increase in output has not led to an increase in bilateral trade, it in fact means that the bilateral trade costs goes up. Therefore, use of Novy(2006)'s model and methods will not only greatly improve the defects of the traditional gravity model and the current gravity model with theoretical foundation but also make data availability convenient and feasible.

3.2. Data sources

If we want to measure the bilateral trade costs between China and the 28 major trading partners by using Novy's model and methods, first we need to acquire the actual data of mutual exports between China and its trading partners and each of their actual total exports as well as the actual data of GDP. The relevant data of each country's export come from the United Nations Commodity Trade Statistics Database (UN COMTRADE), while the data of each country's GDP is obtained from the International Monetary Fund(IMF).In the calculation of the trade costs, the numerical value of GDP and trade costs are the value of the current year, for the trade costs is a ratio not influenced by the deflating index. In estimation of the gravity model, as the index of parity income of purchasing power is more suitable for estimation of the long-term trade flow , the figures of GDP in this paper is calculated on the bases of purchasing-power parity(PPP) in the IMF database according to the sample study period. The data of distance has been adopted in the form of the spherical distance from Beijing to the other political or economic center of countries as the explanatory variable, which is from "distance calculator" in the site www.indo.com. And the data of exchange rate is from "China Statistical Yearbook 2008".The 28 countries we have selected are as follows: Brazil, Turkey, the Philippines, Mexico, Finland, Denmark, Pakistan,Sweden,Ireland,Israel,Switzerland,Argentina,Greece,New Zealand,Norway, Russia, Canada, the United Kingdom, Germany, France, the United States, Australia, India, Indonesia, Egypt, Italy, Thailand, the Netherlands. The time span of the sample we have selected is from 1992 to 2007.

The value of the two parameters (the share of tradable goods)and ρ (elasticity of substitution) in the equation (2) is very difficult to estimate directly from the data. As for the tradable share, evidences show that the tradable output is between 0.3 to 0.8(Evenett,Keller,2002) [21].Novy(2006) and Jacks etc.(2006) [22] set s at 0.8. Considering that there are 15 developed countries as well as 13 developing countries in our 28 sample countries, the share of tradable goods should be high Therefore, we think that it is appropriate to set s at 0.5.As for the elasticity of substitution, low elasticity of substitution means that the consumers lack sensitivity to the price and trade costs, and they tend to conduct more trade as a result. Anderson and vanWincoop (2004) have summarized all the estimated results of all the existing literature and they thought the value of the elasticity of substitution ρ may fall into the range between 5 and 10.In order to explore the impact on trade costs from the elasticity of substitution better, we will set the value of ρ at 5(low),8(middle),10(high) respectively.

According to Novy (2006)'s research thoughts and methods, when s=0.8, ρ =8,we have measured the changes in bilateral trade costs between China and other 28 countries from 1992 to 2007 by using bilateral trade data. In order to solve the problems of period heteroskedasticity and autocorrelation in the model, we adopt generalized least squares (GLS) in the thesis to carry out the multiple linear regression analysis based on the panel data.

$$\begin{aligned} Log\tau_{ij} &= c + \beta_1 Lograte \\ &+ \beta_2 Logdistance + \beta_3 LogY_i \\ &+ \beta_4 LogY_j + \beta_5 high \\ &+ \beta_6 Apec + \beta_7 Asean \\ &+ \beta_8 EU + \beta_9 WTO + \varepsilon \end{aligned} \qquad (5)$$

τ_{ij} means country I to country j's trade costs; rate is the exchange rate for RMB against the U.S. dollar; and distance is for the absolute distance between country I and country j; Y_j and Y_j are the GDPs of country I and country j respectively. Ape, WTO, EU, Asean are virtual variables;1 indicates that country j belongs to the trade group, while 0 is for not; The level of national income in the country is i subject to the division of the country in International Monetary Fund, and set high for dummy variable,1 for developed countries,0 for underdeveloped countries.

The results of the multiple regression are as follows:

$$Log\tau_{ij} = 0.027637Lograte + 0.063842Logdistance - 0.106516LogY_i - 0.052159LogY_j - 0.018167high - 0.044207Apec \quad (6)$$

(4.27) (13.12) (-16.64) (-9.16) (-3.00) (-6.65)

R^2=0.93 DW=2.04 S.E.= 0.96 F=1129.84

Regression results show that the seven explanatory variables pass the examination and the other explanatory variables have maintained high significance on the basis of the unchanged effectiveness of the regression equation. Among them, the value of R_2 indicates the high fitting optimization, and strong interpretation to the reality; the value of DW indicates that the explanatory variables are independent of each other and there is no correlation; the test value of F indicates that the explanatory variables of the equation generally have a significant linear effects on the explained variables through the general linear significance test of the equation.

4.Analysis of the Research Results

4.1.The cost of China's foreign trade shows a downward trend

When s=0.8, ρ =8,the bilateral trade costs of equivalent tariff between China and other 28 countries comes down from 61.1% to 49.1% during the year 1992 to 2007, decreasing by 12% averagely, which reflects the ever increasing extent of openness of China to the outside world and the accelerating integration into the global economy.

We can clearly see that the bilateral trade costs of equivalent tariff of China and other 28 countries have declined greatly and the trade costs with 28 major trading partners has fallen below 50% in 2007. Among them, the trade costs of the United States has decreased from 51.3% in1992 to 39.6% in 2007,Canada from 55.9% to 48.0%,France from59.1% to 48.6%,Germany from 53.6% to 40.4%. The orders in terms of the margin of decline from big to small are as follows: India (19%),Ireland(18%), Brazil, the Philippines, Israel, Thailand (17%), Argentina(16%), the Netherlands, Mexico(15%), Finland(14%), Germany(13%), the United States, Australia(12%), France(11%),the United Kingdom, Sweden(10%), Italy(9%), Canada(8%), Greece, New Zealand, Norway, Russia, Egypt, Pakistan (7%). Obviously, the trade costs of China and other developing countries decrease faster.

4.2. China's major trading partners showed a downward trend in bilateral trade costs

All of our trading partners' trade costs show a downward trend from the year 1992 to 2007. For example, the trade costs with the developed countries has less than 50%, while the trade costs with the developing countries are close to 50%, which indicates that the higher the income level is, the lower the policy cost is.

4.3.The changes in bilateral trade costs under different elasticity of substitution.

Table 1 the decline in trade costs of China and 28 trading partners(1992-2007)

countries	the average decline in trade costs from 1992 to 2007		
	ρ=5	ρ=8	ρ=10
Brazil	0.15	0.17	0.16
Turkey	0.10	0.12	0.11
Philippines	0.17	0.17	0.16
Mexico	0.13	0.15	0.14
Finland	0.13	0.14	0.13
Denmark	0.10	0.12	0.11
Pakistan	0.06	0.07	0.06
Sweden	0.09	0.10	0.09
Ireland	0.16	0.18	0.18
Israel	0.14	0.17	0.16
Switzerland	0.10	0.11	0.10
Argentina	0.15	0.16	0.15
Greece	0.06	0.07	0.07
New Zealand	0.07	0.07	0.07
Norway	0.06	0.07	0.07
Russia	0.08	0.07	0.06
Canada	0.09	0.08	0.08
The United Kingdom	0.10	0.10	0.10
Germany	0.14	0.13	0.12
France	0.10	0.11	0.10
the United Stated	0.13	0.12	0.10
Australia	0.13	0.12	0.11
India	0.18	0.19	0.18
Indonesia	0.10	0.09	0.08

Egypt	0.06	0.07	0.07
Italy	0.09	0.09	0.08
Thailand	0.19	0.17	0.15
the Netherlands	0.16	0.15	0.13
the average decline	0.12	0.12	0.11

Note: There is lack of the annual data of some countries. The margin of decline in Russia is from 1996 to 2007,while Egypt is from 1994 to 2007.The decline of other countries are all from 1992 to 2007.

When ρ =8,the bilateral trade costs of China and 28 countries dropped by an average margin of 12% from the year 1992 to 2007 (as is shown in Table 1).In order to test the different influences on trade costs by the different values of the elasticity of substitution ρ ,we have further calculated the tariff equivalent of trade costs of China and 28 countries respectively when ρ =5 and ρ =8.From As shown in Table 1, different elasticity of substitution have more effect on the absolute value of the cost. For example, in 2007 (as is shown in Table 2),the bilateral trade costs between China and USA drop to 32.4% when ρ =10,while they are as high as 58.6% when ρ =5. And it is also the case with the trade costs between China and other countries. However, obviously the changes in trade costs rather than its absolute magnitude truly reflect the degree of openness of a country. We have found that though the influences of the different value of ρ on the absolute value of trade costs are not quite large, different values have not changed the trend of the bilateral trade costs between China and 28 countries.

Table 2 the decline in trade costs in 2007

countries	decline in trade costs in 2007		
	ρ=5	ρ=8	ρ=10
Brazil	0.69	0.49	0.41
Turkey	0.75	0.55	0.46
Philippines	0.63	0.44	0.36
Mexico	0.74	0.54	0.45
Finland	0.69	0.49	0.40
Denmark	0.73	0.53	0.44
Pakistan	0.74	0.54	0.45
Sweden	0.72	0.52	0.43
Ireland	0.72	0.51	0.43
Israel	0.73	0.53	0.44
Switzerland	0.71	0.51	0.43
Argentina	0.70	0.50	0.41
Greece	0.82	0.62	0.53
New Zealand	0.74	0.54	0.45
Norway	0.76	0.56	0.47
Russia	0.63	0.44	0.36
Canada	0.68	0.47	0.39
The United Kingdom	0.70	0.49	0.41
Germany	0.59	0.40	0.33
France	0.69	0.49	0.40
the United Stated	0.59	0.40	0.32
Australia	0.63	0.44	0.36
India	0.66	0.46	0.38
Indonesia	0.64	0.44	0.37
Egypt	0.79	0.59	0.50
Italy	0.69	0.49	0.41
Thailand	0.56	0.37	0.31
the Netherlands	0.61	0.42	0.34

In addition, we have noticed that the bilateral trade costs between China and 28 countries demonstrated an accelerating downward trend after the year 2001regardless of the value of ρ .This reflects the effect of China's accession to the WTO to some extent, which somewhat shows the effects of China's entry into the WTO and that China has fulfilled all the obligations and commitments well and enjoys the power and privileges that the WTO members shall enjoy.

4.4.The quantitative analysis of influencing factors of trade costs

Factors that influence trade costs are as follows: the virtual variables such as the exchange rate influencing the trade costs, geographical distance, income level, historical linkages as well as the Apce, WTO, EU,Asean etc..

The regression function shows that, suppose other conditions remain unchanged, if the exchange rate of country j fluctuates by one unit, the trade costs of China to country j will vary by 0.027637 unit. Obviously, the impacts of the exchange rate fluctuations on trade costs are not great, almost no impact with a small elastic coefficient, which means that the changes of RMB exchange rate will have small effect on the trade costs of China and its trading partners. As a result, we shall not overestimate the impacts of the changes of the real effective exchange rates of RMB on trade costs.

Trade costs determined by geographic location is still a factor influencing the bilateral trade costs of China and major trading partners. We find that although distance has negative effect on the trade costs of bilateral countries, that is the farther two countries are away to each other, the smaller the trade costs will be. Meanwhile we find that the size of bilateral trade costs and bilateral distance have no corresponding relations, which reflects the improvement of the transport technology. Therefore it is truly inappropriate to only use the distance to replace the trade costs.

The total economic output and market size as well as per capita income level of a country are the major factors that affect trade costs with positive relationship. . That is because, when the size of

gross domestic product is large, it will not only provide a wide range of market activities to manufacturers, but also lay a basis for enterprises to strengthen the production of differentiated products in case of increasing returns to scale so as to promote bilateral trade development; and the rise of the level of pre capita income will increase the consumers' demand for differentiated products.

The historical changes on the impact of trade costs are significant. This shows that late-development trading partners have gradually enhanced their understanding of China so that the gap of information cost caused by historical factors will be narrowed..

5.Conclusion and Policy Significances

The traditional gravity model and the current gravity model with the theoretical basis have some defects of various extent when used for measuring the trade costs. The methods and models put forth by Novy(2006) have improved the defects, which is also easy and available to acquire the data. Using this method to measure the bilateral trade costs of equivalent tariff between China and 28 countries, we find that China and these countries' trade costs of equivalent tariff have been fallen below 50% and the average margin of decline is up to 12% from the year 1992 to 2007.As the 28 countries occupy a quite important position in China's foreign trade, the bilateral trade costs with them, to some extent, can reflect China's level of the overall trade costs. This fully shows that the ever-increasing extent of openness of China to the outside world is and the accelerating integration into the global economy during the 15 years.

This conclusion has not only provided a new analytic perspective for us to understand the expansion of China's export trade. What is more, it has provided rich policy implications. . For the Government, it can reduce the cost of exports, and promote the development of bilateral trade as well as raise China's international trade competitiveness by means of the multilateral trading system, bilateral trade agreements etc.. Certainly, this thesis is still a preliminary research. Due to data availability and other reasons, this thesis has only studied the export trade and trade cost of China and the 28 major trading partners from the year 1992 to 2007.

In fact, the expansion of the period span and section capacity of the sample will help us to conduct a more comprehensive analysis of the relation of the bilateral trade costs' changes between China and major trading partners since China's reform and opening up, and of the different countries (both developed and developing countries), also which can also help us to set up differentiated suitable trade policies according to local conditions . We believe that these are research directions that may yield more research achievements in the future.

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