Chapter 8
Competition for Export Share in American Market Between China and Major Latin American Countries: 2001–2010

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8.1 Introduction

The economy of China and that of Latin America and the Caribbean region[1] have achieved rapid development since the beginning of the 21st century. China's economy grew at an average annual rate of 9%, and its total economy surpassed that of Japan in 2010 to become the second largest economy in the world. After Latin America climbed out of Argentina's crisis in 2003, it has maintained 6 consecutive years of rapid economic growth with stable macro-economy, as well as steadily declining unemployment rates and inflation rates until the outbreak of the global financial crisis in 2008. In recent years, the "Chinese factor" has received widespread attention in terms of the economic development of Latin America. As a result of China's strong demand for imports, prices for primary products and exports volume have risen, which helps Latin American countries to achieve economic growth and quickly emerge from the global financial crisis. However, concerns are growing about the competition from China, especially about the fact that China's exports have crowed out Latin America in the American market.

China and Latin America are the major exporters of the world. In 2010, China's total exports reached $1578.3 billion, 87 times what they were 1980, with an average annual growth of 17.2% and accounting for 10.46% of the world's total exports, thus making it the world's largest exporter.[2] China not only exports a large number of labor-intensive products and low tech products, but also more and more knowledge intensive and high-tech products, covering almost all fields of industry, from

[1] Hereafter refer to as "Latin America".

[2] Data of 1980 is from Ministry of Commerce of the People's Republic of China: China Commerce Yearbook 2004, Beijing, 2005. Data of 2010 is from the 2011 report of UNCOMETRADE (UNCOMETRADE, http://comtrade.un.org).

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textiles to products with high added values. Latin America is the world's major commodity exporting area since its independence. Latin America received 12.4% of the world's total exports in 1950. Since 1980, Latin American countries have gradually terminated its import substitution strategy and began to reform the structure of export trade. Consequently, the total export volume significantly increased. Since the beginning of 21st century, world economic growth has stabilized. China's strong demand for imported raw materials began to drive up Latin America's exports. Trade export growth in the Latin American region in the first 10 years of the 21st century was 7.4%. Due to the huge differences between countries in Latin America, the average growth rate cannot reflect the specific performance of individual countries. Specifically on the national and regional level, the South Common Market and the Andean Community countries performed significantly better than other countries in the region with an export average annual growth rate remaining over 10%.

As a rapidly emerging market, China has seen a rapid rise of its proportion in the world's total exports, making Latin America, a region depending heavily on exports consider China as a big rival. On one hand, the United States has been the main export destination of China since the turn of the 21st century. China is very dependent on its exports to the United States. On the other hand, the United States has also been a main export destination for Latin America since the end of World War II. Therefore, China and Latin America's export competition in the U.S. market is valued by the academic circles and in recent years, more and more discussions support that the rise of China will make it compete ever fiercely with Latin America in terms of exports. Some people believe that China has a significant crowding-out effect on Latin America's market share in the US market.

China's economy is largely driven by its strong export growth. The United States is China's largest trading partner; the expansion of China's market share in the United States is bound to be accompanied by loss of market shares in other countries and regions. 70% of total Latin American exports go to the United States, so the study of Latin American trade competition in the U.S. market is necessary. In the previous studies, foreign scholars used the extended CMS method, the gravity model and the econometric model of substitution elasticity. Almost all literature holds that China's export growth has a negative impact on Latin American exports in third-party markets. The mainstream view is that China, to a certain extent, has crowded out the export share of Latin American countries. Only Lederman et al. (2006) pointed out that China did not occupy the Latin American share in third-party markets. Lidoy (2007) studied 34 economies on their competition with China (including 15 Latin American countries) in 1998–2004 using a database containing 620 different kinds of goods. He found that there was no trade competition between China and Latin America in the American market as China is a net importer of raw materials and an exporter of manufactured products; therefore, Latin American countries, which mainly export primary products, face little competition from China. Hanson and Robertson studied the situation of four countries, namely Mexico, Brazil, Argentina and Chile. While explaining the reasons for declining market Latin American export shares in the world, competition from China is only considered as a secondary factor.

8.2 Comparison Between China and Latin American Countries on Exports

Since China's accession to the WTO in 2001, it has quickly enhanced its import and export trade by making full use of globalization and of the rules of the WTO. China has made particularly great achievements in the production of low-tech products. As Latin America's exports are pretty large in size, we will first compare changes in total trade volume and respective proportion in the world's total trade volume. China's total exports exceeded that of Latin America in 2002, and the difference between the two regions has been growing since then. In 2003 China's total export volume was 60 billion U.S. dollars higher than that of Latin America, and in 2010 this figure rose to over 700 billion, more than a tenfold increase. The rapid increase in China's trade exports means that they take a larger proportion of the world's total export; this proportion had exceeded 10% in 2010. Although the trade volume of Latin America also increased during the same period, the increase in the proportion was very small in comparison to that of China. Given the proportion of respective export volumes in the world's total for the two regions, Latin America is relatively stable, close to 6%. It is safe to say that export trade in Latin America develops simultaneously with world export trade, and no significant increase or decrease is found.

In terms of the structure of export commodities, China's exports are concentrated in manufactured goods. China's top 10 exports products from 2008 to 2010 were all SITC commodities under code 7, except for liquid crystal devices. According to the data in Table 8.1, we can see that the most important feature of China's export commodities structure is the sharp decline in the proportion of primary products (from 50.3% in 1980 to 5.2% in 2010). The proportion of manufactured goods increased significantly (from 49.7% in 1980 to 94.8% in 2010). It can be said that China has basically achieved the optimization of its export structure in the last 30 years of reform and opening up.

We can see in Table 8.2 among Latin America's top 10 exported products; there are 6 primary products and crude oil accounting for the largest proportion, which is basically maintaining itself at over 10%. In the first decade of the 21st century, Latin America was dependent on exports of primary products. The optimization and upgrading of the export structure was not achieved yet.

China and Latin America have a variety of export destination. The EU, the United States, Japan and ASEAN have become the main export destinations of China. The proportion of Latin American exports to the United States is declining, and China has become one of its new export destinations. However, this situation is not balanced in the whole Latin American region. Regional powers are far more successful than Central American and Caribbean countries in terms of trade diversification. Brazil's exports to developing countries have exceeded its total exports to developed countries (EU, USA and Japan) since 2008, and its export growth in non-traditional markets (Africa, the Middle East and Asia) has surpassed that in traditional markets. Mexico's exports are concentrated in the United States and Canada, of which exports to the

Table 8.1 Structure of China's export commodities during the period of 1980–2010 (USD 100 million)

	1980		1990		2000		2010	
	Volume	%	Volume	%	Volume	%	Volume	%
Export volume	181.2	100	620.9	100	2492.1	100	15,777.5	100
Primary products	91.1	50.3	158.9	25.6	254.6	10.2	817.2	5.2
Industrial manufactured goods	90.1	49.7	461.8	74.4	2237.5	89.8	14,962.2	94.8
Mechanical and Electrical Products*	13.9	7.7	110.9	17.9	1053.1	42.3	9334.3	59.5
High-tech Products*	–	–	–	–	370.4	14.9	4924.1	31.2

Notes Mechanical and electrical products and high-tech products contain some overlapping products
Data source China Customs Statistics, http://www.customs.gov.cn/publish/portal0

former account for more than 80% of its total exports. However this value has been reducing and dropped to 79.97% in 2010.

We see that the United States is the main common export destination for China and Latin America. As the United States is the largest import country in the world and is the most important trading partner of Latin American and Caribbean countries, it is necessary to carry out quantitative analysis on export competition between China and Latin America in the United States market.

8.3 Export Competitiveness Analysis of China and Latin America

This part uses the two indicators, market share and trade intensity, to analyze the general export competition between China and the major countries in Latin America. These two indicators are measured in terms of the trade volume of the countries from different angles. Although it cannot be specifically refined to every commodity, a qualitative analysis to determine the existence of competition is possible.

8.3.1 Market Share

Market Share (MS) refers to the percentage a specific country's export volume to the US against the total import volume of the US during a certain period of time. Market share index reflects the general level of competitiveness of the target export country.

Table 8.2 Proportion of Latin American Exports Products (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Crude oil	10	12.1	12.9	11.9	14.5	15.7	9.3	10.6	8.7	10
Bus	5.6	5	4.2	3.4	3.3	3.6	3.9	3.8	3.5	4.1
Iron ore	–	–	–	–	–	–	–	2.1	2.2	4
Refined copper	1.5	–	–	2.1	2.2	3	3.4	3	2.8	3.4
Television broadcasting receiver	1.9	2	1.8	1.7	1.9	2.5	3.2	2.9	3	2.7
Ore & concentrate copper	–	–	–	–	1.6	2.4	2.9	2.3	2.1	2.6
Soybean	–	–	1.8	1.7	1.5	–	1.7	2.2	2.4	2.4
Telephone & telegraph equipment	–	–	–	–	–	–	1.8	2.2	2.7	2.4
Oil products	3.5	2.1	2.3	3.8	4.7	4.7	2.8	4.3	3.1	2
Components of motor Vehicles	1.7	2	1.9	1.9	1.8	1.8	2.3	–	–	1.8
Total	24.2	23.2	24.9	26.5	31.5	33.7	31.3	33.4	30.5	35.4

Data source ECLAC,*Statistic Yearbook for Latin America and Caribbean 2011*, Santiago, Chile, 2011

$$MS_r^t = \frac{\sum_i \mathrm{Im}\, porst_{ri}^t}{\sum_i \sum_c \mathrm{Im}\, porst_{Ci}^t} \quad (1)$$

t represents a period of time, usually a year; i represents the type of goods, r represents the target country, c stands for all the countries that export to the United States market, $r \in c$. In Formula (1), the molecular represents all the exports from the target country to the United States in period t and the denominator represents all the total goods the United States imports during the period t.

Clearly, the increase in market share represents an increase in export competitiveness. America is the world's largest importer. According to the American National Bureau of Statistics, the U.S. imports of goods amounted to $536.53 billion in 1992. This figure reached $1230.57 billion in 2000. In 2011 the annual import volume of the United States was $2235.28 billion.[3] Looking back at the past 20 years, for almost every decade, the United States of America doubled its imports. How to make good use of the United States' market has become a strategic theme for every country.

The degree of exports from China and Latin America's seven largest countries to the United States each year is different. China and Mexico rank among the top; Brazil, Columbia and Venezuela are in the middle, and the other countries rank at the bottom. Thus we can take a look at the shares of these countries from the classification's point of view.

We first look at the competition between China and Mexico. As Mexico is a member of the North American Free Trade Area, most of its exports go to the United States (80%). We can say that the United States is the most important trading partner of Mexico. According to Fig. 8.1, the share China accounted for in U.S. imports exceeded that of Mexico in 2003. The gap between the two countries has been widening since then. In 2000 the United States had 6.9% of its total imports in provenance from China and 9.38% from Mexico; by 2011, China's share rose to 15%, but Mexico's still remained at the same level. Over these 10 years, Mexico's exports accounted for a relatively stable market share in the United States, while China's share increased year by year. We do not see China in the U.S. market crowding out Mexico.

Now let's look at other countries. As these countries are more diversified than Mexico, the amount of exports to the United States accounts for a smaller share in the US. In the 10 years from 2000 to 2011, although there were some rises and falls, they occurred a very small range. Except for Argentina whose market share in the US in 2011 was a little less than what it was in 2000, the rest of the country achieved a slight increase in terms of market shares (Fig. 8.2). So we can come to the same conclusion as in the Mexican case: that the increase in the market share of China in the United States is not a threat to major Latin American countries, as seen from the total amount of trade.

[3] American National Bureau of Statistics, http://www.census.gov/foreign-trade/Press-Release/current_press_release/.

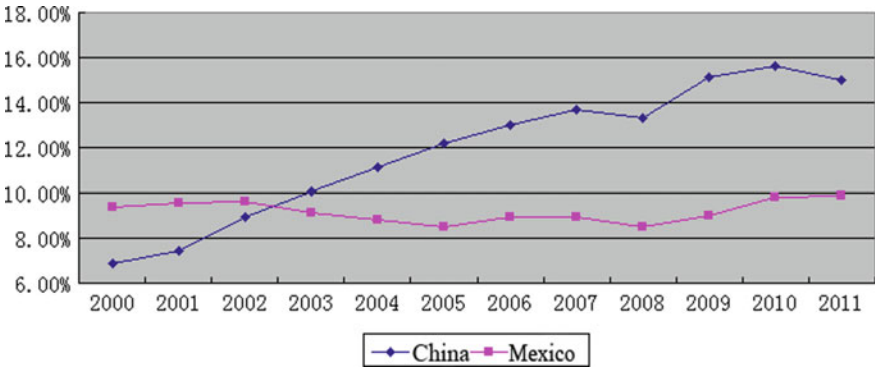

Fig. 8.1 Shares China and Mexico r in the US imports. *Data source* American National Bureau of Statistics, http://www.census.gov

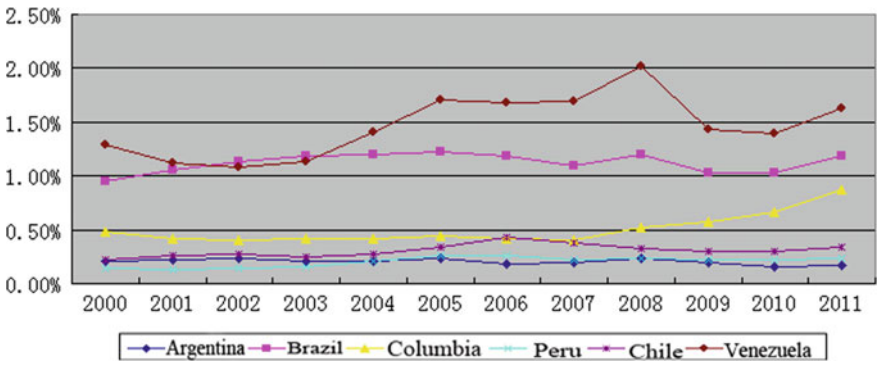

Fig. 8.2 Shares other Latin American countries in the US imports. *Data source* American National Bureau of Statistics, http://www.census.gov

8.3.2 Trade Intensity

The market share index can reflect the export performance of a country compared to other countries exporting to the United States. Trade Intensity (TI) measures whether the export shares of an exporter to the US market has comparatively reached the expected level This index describes the competitiveness of an exporter in a relative sense, that is, whether a country's competitiveness in a certain export market has reached an average level in terms of the global market. Trade intensity reflects how closely the exports of a country are linked to the US market in comparison to the world market, or in other words, how open the market of a country is to the US market. The formula is as follows:

$$TI_{ij} = \frac{X_{ij}/X_{iw}}{M_{jw}/M_{ww}} \tag{2}$$

X represents export, M stands for import, I represents the export country, j stands for the USA. X_{ij} stands for country i's export volume to the US. X_{iw} represents country i's export volume to the world market, M_{jw} stands for the import volume of the US, M_{ww} stands for the total import volume of the world. If the result is greater than 1, it indicates that the exports of the exporter to the United States are greater than its expected share based on its share in the world trade, or that the development of the country in the U.S. market is higher than its average level of development in the global market.

Table 8.4 reflects the trade intensity of China and seven major Latin American powers in the US market during the period of 2002–2010. The export intensity values of Mexico, Venezuela, Columbia, China, Peru and Brazil were more than 1 (in recent years, the export intensity of the latter two countries have declined: Peru dropped slightly to below 1 and Brazil was less than 1 for 4 consecutive years from 2007), showing that the shares of these countries in the US market have exceeded the expected level of their respective shares in the world's export markets. In other words, the development of these countries in the U.S. market is very significant. Among them, Mexico, Venezuela and Columbia have made full use of their geographical advantages, and thus their trade intensities are above that of China. In addition, the trade intensities of Chile and Argentina's exports to the United States are relatively low. Trade intensities of Peru and Brazil in recent years have dropped to below 1. So from the point of view of trade intensity, the seven largest countries in Latin America are divided into two groups in accordance with their geographical positions. These two groups show different intensities of trade in terms of exports to the United States while China has played the role of a dividing line.

By comparing the absolute indexes, we get a general idea of the exports intensity of these countries to the United States. Changes in the intensity of trade each year should also be examined. Figure 8.3 shows the evolution of trade intensity for various countries in recent years. We can clearly see that Mexico, Venezuela and Columbia were the top 3 and that their trade intensity values remained stable. There were some increases in value since 2002, among which the value of Mexico was the biggest and the gaps between it and the other countries were widening. In contrast to these three countries, the trade intensity of China, Brazil, Peru, Chile and Argentina in American market had been weakening. In 2010, except for China, the values of trade intensity of the other four Latin American countries were reduced to below 1. The trade intensity index of China's exports to the United States fell from 1.79 in 2002 to 1.49 in 2010. Chile and Argentina's trade intensities were below 1, indicating that the two countries do not consider the United States as their most important export market. From an historical perspective, the export areas of the two countries also prove diversifying.

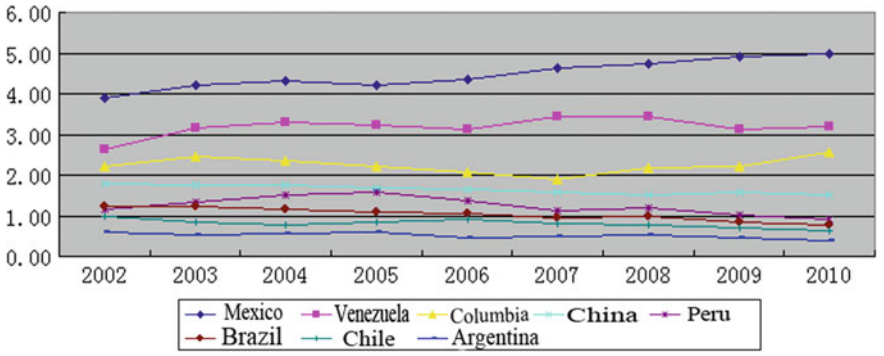

Fig. 8.3 Changes in trade intensities of China and seven major Latin American countries (2002–2010). *Data sources* Calculated and plotted according to the relevant data in the 2011 Report of the United Nations Trade Commodity Statistics Database (http://comtrade.un.org) and National Bureau of Statistics of the United States of America (http://www.census.gov/)

8.4 An Empirical Study on China's Export to the United States Crowding Out Latin America in the US Market

After examining the degree of competition between China and major Latin American countries in terms of their total amount of trade exports, it is necessary to make a quantitative analysis on the competition between China and Latin American countries in terms of export market share at the commodity level. After the industrial adjustments made during China's reform and opening up, exports of primary products fell, while Latin America is still dependent on these exports of primary products. Recently, re-industrialization was re-proposed by many Latin American countries. Therefore, more manufactured goods will be exported by Latin America as it endeavors to upgrade its export and restructure its industries. This part mainly focuses on how many market shares for manufactured goods have been taken by China.

8.4.1 The Theoretical Basis of the CMS Model

The Constant Market Share Model (CMS) was first applied in the analysis of international trade by Tyson in 1951. In recent decades, it has become an effective tool to measure the competitiveness of a country's export. In the analysis framework of this model, changes in a country's export are divided into four factors: the international total export growth factor, the market factor, the products factor and the competitiveness factor. The CMS model assumes that if a country's competitiveness remains unchanged, the country's share in the target market should remain constant. The

difference between export growth calculated by the CMS method and actual growth can be attributed to the influence of competitiveness. In the four factors of changes, the first three represent the constant export share a country maintains in a market; collectively they are referred to as the structural level. The last factor gives rise to the change in exports share, which is called the competitiveness level.[4] The price factor can be used to describe competitiveness, which means that the changes in the export shares in the target country market of different countries are due to the differences in prices; that is to say, demand is a function of price.

Consequently, the change of the relationship between the export prices and the export market share is the theoretical basis of this model. Assume that there are two countries that export to one market at the same time, and they both export the same product; the export demand of the export countries competing with each other in the third party market can be expressed as[5]:

$$\frac{q_1}{q_2} = f\left(\frac{p_1}{p_2}\right) \tag{3}$$

q_1 stands for the export volume of country 1, p_1 stands for the export price of country 1. For the same reason, the price and export volume of country 2 take the same forms. Thus this function shows how the products of the two countries can be alternative to each other. Trade competition is in essence price competition. Of course, this price reflects the competitiveness of a country's exports, including endowments, technology, transportation costs and other elements. We also need to further modify the formula.

$$\frac{p_1 q_1}{p_2 q_2} = \frac{p_1}{p_2} \times f\left(\frac{p_1}{p_2}\right) \tag{4}$$

$$\Rightarrow \frac{p_1 q_1}{p_1 q_1 + p_2 q_2} = \left(1 + \frac{p_2 q_2}{p_1 q_1}\right)^{-1} = \left\{1 + \left[\frac{p_1}{p_2} \times f(\frac{p_1}{p_2})\right]^{-1}\right\}^{-1} = g\left(\frac{p_1}{p_2}\right) \tag{5}$$

$p_1 q_1/(p_1 q_1 + p_2 q_2)$ is the exports share of country 1 in the third market and $g(p_1/p_2)$ is a function that takes the export price ratio between the two countries as the independent variable. So we can take the exports share of country 1 in the third party market as a function of the relative price of the two countries. This means that unless the relative commodity price changes between the two countries, otherwise the exports share of country 1 in the third party market remains unchanged.

[4]Merkies, A. & Meer T, "A Theoretical Foundation for Constant Market Share Analysis", *Empec 1988*, Vol. 13 pp. 65–88.

[5]Xiaodan, S. (2007). Research on the dynamic structure and growth of international trade of agricultural products, Beijing: Chinese Academy of Agricultural Sciences.

8.4.2 Improvement of the Model

The improved Constant Market Share model is used to measure whether a country is crowded out by another country through trade competition in a third country. After decades of development, there has been a very complete and mature model internationally. This paper uses the Constant Market Share model proposed by Batista in 2008.[6] Compared with the traditional model, this model divides the changes of one country's total share of exports in another country in a certain period of time into two parts: competition effect and product composition effect.

$$\Delta K_H = \Sigma X_{Hi}^{t} \times \Delta m_i + \Sigma M_i^{t+1} \times \Delta K_{Hi} \tag{6}$$

K_H	represents the share country H accounts for in the total amount of exports of the US
X_H	stands for the trade volume country H exports to the US
m_i	stands for the share commodity i accounts for in total imports volume of the US
M_i	stands for the trade volume of commodity i the US imports
t and $t+1$	stand for the year.

In Formula (6), the first part is the effect of commodity composition, and the second part represents the competition effect.

If there are only two exporters competing in the third country market, then the increase in the share of one country's exports is bound to be at the expense of another country's export share. In reality, trade competition in the market of the United States exists among many countries, thus some countries will increase their market shares with enhanced export competitiveness while other countries will lose export shares because of weakened export competitiveness. It is necessary to further analyze the market share loss of a country to see which country one country is crowded out by.

Batista believed that the original model does not take into account the export growth rate of the country's exports in the third party market and therefore he improved the model. He put forward a new method taking the increase of the export growth rate of the two countries into the composition of the competition effect. In other words, if one country's exports to the United States increase slower than another country, then the loss of the country's share of exports could be the increase of the shares of another country. Market share of commodity i of country (H) occupied by China (C) can be expressed as:

$$\Delta K_{HCi} = \Delta K_{Hi} \times K_{Ci}^{t} - \Delta K_{Ci} \times K_{Hi}^{t} \tag{7}$$

[6]Chami Batista, "Competition between Brazil and other Exporting Countries in the US Import Market: A New Extension of Constant-Market-Shares Analysis", *Applied Economics,* Vol. 40, No. 19, pp. 2477–78, 2008.

Add the above formula and we can get the market share lost to China in all the categorizes:

$$\Sigma \Delta K_{HCi} = \Sigma \Delta K_{Hi} \times K_{Ci}^{t} - \Sigma \Delta K_{Ci} \times K_{Hi}^{t} \tag{8}$$

Formula (7) can be rewritten into:

$$\Delta K_{HCi} = \left(\frac{\Delta K_{Hi}}{K_{Hi}^{t}} - \frac{\Delta K_{Ci}}{K_{Ci}^{t}} \right) \times K_{Hi}^{t} \times K_{Ci}^{t} \tag{9}$$

Because $x_{Hi}^{t} = \frac{X_{Hi}^{t}}{M_{H}^{t}}$, and $K_{Hi}^{t} = \frac{X_{Hi}^{t}}{M_{i}^{t}} = x_{Hi}^{t} \times \frac{M_{H}^{t}}{M_{i}^{t}}$
Bring this result into the Formula (9), we can get:

$$\Delta K_{HCi} = \left(\frac{\Delta K_{Hi}}{K_{Hi}^{t}} - \frac{\Delta K_{Ci}}{K_{Ci}^{t}} \right) \times x_{Hi}^{t} \times \frac{M_{H}^{t}}{M_{i}^{t}} \times K_{Ci}^{t} \tag{10}$$

And then it can be rewritten into:

$$\frac{M_{i}^{t}}{M_{H}^{t}} \times \Delta K_{HCi} = \left(\frac{\Delta K_{Hi}}{K_{Hi}^{t}} - \frac{\Delta K_{Ci}}{K_{Ci}^{t}} \right) \times x_{Hi}^{t} \times K_{Ci}^{t} \tag{11}$$

Finally add all the goods:

$$\frac{1}{M_{H}^{t}} \times \Sigma M^{t} \times \Delta K_{HCi} = \Sigma \left(\frac{\Delta K_{Hi}}{K_{Hi}^{t}} - \frac{\Delta K_{Ci}}{K_{Ci}^{t}} \right) \times x_{Hi}^{t} \times K_{Ci}^{t} \tag{12}$$

8.4.3 Empirical Analysis

8.4.3.1 Selection of Target Countries

There are 33 countries in Latin America and their specialization in terms of exports and regional structure is not the same. In general Latin America can be divided into three regions:

(1) South American countries: the main representatives are Brazil, Argentina, and Chile. The level of economic development of these countries is higher, and the structure of commodity exports and regional structure is more diversified. Their total trade volume accounts for more than half of Latin America.
(2) Central American region: mainly refers to the Central American countries and their representatives, Costa Rica and Nicaragua. These countries are rich in natural resources and much dependent on the United States in terms of economic development. They have a certain industrial production capacity and the export of manufactured goods is taking shape.

(3) The Caribbean region. The region's economic strength is very small. Due to the region's close distance from the United States, industrial products are mainly exported to the United States. Because of its small trade size in comparison to the first two groups, this group is not the focus of this study.

According to the actual situation of the sub region of Latin America, along with the trade relations and cooperation with China, we selected the seven largest countries in the regions as representatives. They are: Brazil, Argentina, Peru, Chile, Colombia, Mexico and Venezuela. These countries contain major South American and Central American countries, including members of the North American Free Trade area. We also need to select two Central American countries to ensure that the data is comprehensive. Costa Rica is an important trade partner of China. Among the global 10 countries and regions that have set up free trade areas with China, Costa Rica is the third signatory in Latin America after Chile and Peru. Many countries in Latin America have also maintained "diplomatic relations" with Taiwan, so we choose Nicaragua that has not yet established diplomatic ties with China as the representative of such countries.

8.4.3.2 Data Selection

Based on the statistics of the United Nations Trade Commodity (Comtrade) and according to the United Nations SITC third edition of classification standards, this paper focuses on the competition on the manufactured product (5–8 SITC) market between China and Latin America. Calculated by the two bitcodes of SITC, the data for the year 2001, the year 2007 and the year 2010 were selected. China became a member of the World Trade Organization in December 2001, so that year's data represents the situation before China's deepest opening up in trade. The data for the year 2007 represents a situation prior to the global financial crisis and the data for the year 2010 is the latest available data. Of course, we know that imports from Latin American countries generally declined because of the depression in America's own economy after the global financial crisis, but the trade volumes of Columbia and Costa Rica to the United States have increased. This paper does not pay attention to the situation during the period of 2008–2009, since Latin America's exports have been restored after the financial crisis. Instead, the paper focuses on the situation in 2010 and then compares it with that of the year 2007 to see the changes before and after the crisis.

In terms of data categories, according to the traditional H-O trade theory, a country should focus on producing the products with relative advantages, and make full use of the benefits of scale economy to increase general benefits. Latin America is rich in natural resources and specialized in the production of resource intensive products. The amount of exports is large. China's initial trade openness is also resource intensive, but because of China's special national conditions, the strength of trade is driven by the export of labor-intensive industrial products. In recent years, the technical content of China's exported products has strengthened. In 2010 exports of

primary products accounted for only 5.2% of total exports. Other scholars have suggested that an effective way for Latin America to emerge from the current financial crisis is to take the road of technological innovation, to comprehensively improve the level of domestic productivity and optimize the export structure, so this paper only compares the competition on manufactured goods between China and Latin American countries in the United States market.

8.4.3.3 Empirical Results

The left side of Formula (12) states the total exports share loss of country H in the United States market caused by China, the part in brackets on the right states the changes of the exports share of China and country H in the US market during the period of t. When China's market share increases and the growth rate of China's market share is more than that of country H, the value of this part is negative.

China's exports, especially manufactured goods, to the United States have rapidly increased since its accession to the WTO in 2001, in terms of both total volume and proportion. Thanks to China's relatively cheap labor advantage and low price competition, the proportion of manufactured goods in the total exports to the United States is increasing. Table 8.3 shows the market share loss of manufactured goods of the representative countries in the United States market because of China calculated in accordance with the Formula (12).

Nicaragua took up some of China's market share in two periods from the perspective of mutual occupation of trade share, which means that the market share increase in exports of manufactured goods of Nicaragua in the US market came at the expense of a corresponding reduction in China's share. Columbia and Costa Rica were squeezed out by China during the first period, but after the global financial crisis, they succeeded in crowding out China. The values for the rest of the countries

Table 8.3 Market Shares Loss of Manufactured Goods of Latin American Countries in the US Market Because of China (%)

	2001–2007	2007–2010
Argentina	−5.40	−0.94
Brazil	−9.40	−6.42
Chile	−0.84	−1.90
Columbia	−1.80	0.43
Costa Rica	−11.33	21.06
Mexico	−11.53	−1.43
Nicaragua	4.17	0.82
Peru	−3.68	−4.32
Venezuela	−1.07	−0.22

Data source Calculated according to the 2011 Report of the United Nations Trade Commodity Statistics Database, http://comtrade.un.org

Table 8.4 Market Share of Manufactured Goods of Latin American Countries Crowed out by China in US Market under SITC code (%)

Code	2001–2007				2007–2010			
	SITC5	SITC 6	SITC 7	SITC 8	SITC 5	SITC 6	SITC 7	SITC 8
Argentina	−0.06	−2.24	−0.35	−2.76	−0.31	0.90	−0.59	−0.94
Brazil	−0.03	−1.18	−5.37	−2.81	−0.10	−1.76	−3.27	−1.29
Chile	−0.20	−0.06	−0.01	−0.57	−0.11	−1.54	−0.13	−0.13
Columbia	−0.02	−0.70	−0.16	−0.92	−0.03	0.03	0.02	0.41
Costa Rica	0.01	−0.20	−2.66	−8.48	−0.15	0.12	22.37	−1.29
Mexico	−0.03	−0.63	−7.68	−3.19	−0.03	−0.01	−1.20	−0.20
Nicaragua	0.00	−0.02	1.32	2.88	0.00	0.02	1.01	−0.21
Peru	−0.01	−2.01	−0.03	−1.62	0.00	−2.24	−0.03	−2.06
Venezuela	−0.09	−0.68	−0.21	−0.10	−0.08	−0.07	−0.06	−0.02

Data source Calculated according to the 2011 Report of the United Nations Trade Commodity Statistics Database, http://comtrade.un.org

are negative; that is, they were squeezed out of the market share by China in the two periods.

During the two periods, although Nicaragua outperformed China, the market share taken by Nicaragua from China declined. Both Costa Rica and Columbia were squeezed out by China during the period of 2001–2007 and more of Costa Rica's share (11.33%) was taken by China. After the global financial crisis, the two countries achieved increase in shares, especially Costa Rica, which crowded out China by a share of 21.06%. Except for Chile and Peru, the shares squeezed out of the rest of the countries have declined, of which Mexico was confronted with the largest decline (a decline of about 10%). Argentina and Venezuela during the period of 2007–2010 were hardly crowded out by China.

We have a general grasp of the overall picture of manufactured products. However, it is more important to make empirical study on the market shares of specific commodities. It helps to have a more in-depth understanding of Latin American countries in terms of which country takes a larger market share of which product. Table 8.4 shows the squeezed shares of major Latin American countries in the United States market by China based on a product-specific level.

First let's look at Nicaragua, which took the market share of China in terms of SITC 7 and 8 products before the global financial crisis. Nine out of the top ten export products of China belongs to the category of SITC 7, so we say that Nicaragua has brought about competition to China, although the competition is not fierce. After the financial crisis, Nicaragua only squeezed out China's share of SITC 7. Next let's look at Costa Rica. After the financial crisis, Costa Rica grabbed in total 21.06% of China's market share in the US market. However, when we take a look at specific commodities, we find that most of the market share for SITC 5 and 8 products were

still taken by China, although Costa Rica grabbed a staggering 22.37% of China's share in terms of SITC 7 products.

Countries in each of categories of goods having been squeezed out by China are Brazil, Chile, Mexico, Peru and Venezuela. Argentina and Columbia are not crowded out by China in some large category of individual goods. No matter in which period, the shares of the selected countries crowded out by China under SITC 5 can be ignored, that is, in this category China hardly squeezes out Latin American countries. The most prominent extrusion sector is SITC 7 (excluding Nicaragua), which also fully confirms the theory of comparative advantage, because China has a higher comparative advantage in this sector.

8.5 Conclusions

Through the calculation of China's market share crowding out Latin American countries in the United States market, we found that China doesn't occupy too much of the market share of Latin American countries. Especially in the aftermath of the global financial crisis, the market share taken by China from Latin American countries declined. It can be said that during the period from 2007 to 2010, Argentina, Colombia, Mexico, Costa Rica, Nicaragua and Venezuela were not affected by competition from China in terms of manufactured products. Different from previous research, Mexico is faced with little competition from China. In addition, Nicaragua, Costa Rica and Columbia have all crowded out China's share. Nicaragua has not established diplomatic relations with China; Costa Rica has built a FTA with China. The same results in the two countries are enough to represent the specific competition and cooperation between countries in Latin America and China.

Factors that affect the competitiveness of a country's exports include price and non-price factors. The price factor is comparative cost advantages. Specifically they are endowment, scale economy and transportation costs. Non-price factor include product quality, marketing strategy and government policy. When analyzing trade competition, we have to start from the theory of comparative advantages. The basis of international trade is the relative difference of production technology and the difference of relative costs. Each country should focus on producing and exporting its products with "comparative advantages" and importing the products with "comparative disadvantages".

First of all, it is worth to pay attention to endowment. Although there is a lack of resources in a country like Singapore, it has achieved the success of economic development through the re-export trade, but endowment is still the most important foundation of independent growth. China is rich in natural resources, but the per capita level is behind the world average, let alone in comparison with Latin American countries with rich resources. China has the largest population in the world, and has a labor force of 640 million. Based on this labor advantage, Chinese workers' wages are relatively low, so the products are able to participate in the competition in the world market with relatively low prices. While Latin American countries have very

powerful trade unions, coupled with the historical influence of the "elite" mode, the wage level is much higher than in China. It is clear that the competitive advantage of Chinese products in the market is supported by the comparative advantage of labor factors.

We then turn to productivity, that is, the level of technological development. Traditionally, the low wage levels in China reflect the low labor productivity of the Chinese manufactured goods sectors. Compared with the two major Latin American countries of Mexico and Brazil, China's labor productivity is much lower. However, China's growth rate is significantly faster than that of Latin American countries in terms of the changing trends in the level of productivity.[7] Following these trends, China will catch up with other countries in the near future in terms of the level of productivity of some products.

Finally we come to the economies of scale and the role of government. As the world's second largest economy, China's share of exports is also increasing. China has fully utilized the advantages of economies of scale, especially in the production of capital and technology intensive products. It can give full play to the role of the upstream and downstream production chain, save production costs and improve economic efficiency. The learning effect is realized under the background of "learning by doing", and the profits of R&D investment are directly reflected in the production of the product. The difference in total economic output has also played a different role in absorbing FDI for China and Latin America and FDI has a spillover effect on export trade. The government as a "visible hand" involved in running the macro economy is able to press the economic fluctuations and maintain the stability of economic growth. A good macroeconomic environment can ensure the competitiveness of the country's exports. The Chinese government has made full use of fiscal and monetary policies to reverse the course of economic trends and realize the "soft landing" of the macro economy in different periods. Measures designed to "ensure growth and promote employment" put in place after the global financial crisis have been effective in helping China maintain the competitiveness of its exports.

In Latin American countries, as a result of their own economic development strategy, their governments did not begin to tackle macroeconomic instability by deploying counter cyclical policies until the beginning of the 21st century. The international economic cycle also had an impact on Latin America, whose exports were badly hit after the global financial crisis. More recently trade protectionism has been making a comeback in the region, suggesting that a return to reliance on domestically manufactured goods may be a real possibility. Trade in Latin American countries still faces many sources of uncertainty.

China's development will likely offer Latin America an opportunity to be weaned of its long-time economic dependence on the export of a single kind of commodity. In the face of competition from China, Latin American countries can continue to improve the quality of goods and their comprehensive exports competitiveness, thus ensuring the share of exports in the U.S. market. At the same time, Mexico and

[7]Rhys Jenkins, "The Impact of China on Latin America and the Caribbean", *World Development,* 36(2), 235–253, 2008.

Central American countries should take advantage of their short distance from the U.S. market to speed up infrastructure construction and improve the efficiency of roads, ports, railway and airport to reduce the transaction and transportation costs.

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