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Sino-US Trade Imbalance

Doctoral (PhD) dissertation

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DECLARATION

Hereby I certify that the Ph.D. thesis entitled “Sino-US Trade Imbalance” is solely my own work. It contains no material that has been previously written or /and published by any other academic degree or diploma. Any previously published materials that have been used in this thesis are for bibliographical reference.

January 2021 Jiandong Shi

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ABSTRACT

In general, the government of a country should try to maintain a basic balance between imports and exports in foreign trade, somewhat surplus, which contributes to the healthy development of the national economy. The issue of Sino-US trade imbalance occurs with the establishment of Sino-US economic and trade relations and is aggravated with the expansion of Sino-US trade scale. The long-term trade imbalance not only leads to a series of economic issues, but also in recent years, the Sino-US trade imbalance has gradually evolved from an economic issue to a political issue. Sino-US trade is a significant part of the world economic progress and trade development. The adjustment of Sino-US trade imbalance is not only crucial to the economic balance of the two countries, but also plays an important effect on the global economic rebalance.

The study aims to seek out the principal factors and consequences of Sino-US trade imbalance, and figure out the measures to deal with the Sino-US trade imbalance.

Mixed method is adopted in this study. In this study, quantitative research methods are used for data collection and econometric models are used to analyze the factors, influences and trends of Sino-US trade imbalance by using analysis software of Eviews and Excel. Meanwhile, qualitative research method is adopted in this study to analyze the regularity of Sino-US trade imbalance via historical analysis, literature analysis and case study.

Notwithstanding the impact of exchange rate and savings on the Sino-US trade imbalance, the research results show that the difference in the national savings ratio between China and the United States has a more significant impact on the Sino-US trade imbalance. Foreign direct investment is an important reason for enlarging the Sino-US trade imbalance. Despite some adjustment measures have been taken by the two countries, the study has found that the Sino-US trade imbalance will further enlarge in the short run. In spite of the surplus status for China in Sino-US trade, China has been caught in the trap of comparative

advantage, resulting in the widening of the economic gap between the two countries. While the United States runs a trade deficit with China, but trade between the United States and China is still favorable to the growth of US economy. In addition to these, the study also discusses the issues of mercantilism, the history of Sino-US trade, the history of Sino-US trade disputes and other causes and effects of Sino-US trade imbalance existing in Sino-US trade.

Based on the findings of the research, this study puts forward some recommendations for the government and industry associations relevant to Sino-US trade.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADF: Augment Dickey-Fuller test

ASEAN: Association of Southeast Asian Nations

CIF: Cost, Insurance and Freight

DS: Dixit and Stiglitz

DW: Durbin Watson Statistic

EX: China's volume of exports to the US

FAS: Free Alongside

FDI: Foreign Direct Investment

FOB: Free On Board

FPE: Factor price equalization

GATT: General Agreement on Tariffs and Trade

GDP: Gross domestic product

ITC: International Trade Centre

IM: China's volume of imports to the US

IMF: International Monetary Fund

MFN: Most favoured nation

OLS: Ordinary least square

PRC: People's Republic of China

PNTR: Permanent normal trade relations

QC: Difference in the national saving ratio between China and the US

R: Effective exchange rate of RMB against US dollar

RMB: Renminbi

SC: China's surplus volume to the US

SS: Stolper and Samuelson

TN: Total volume of imports and exports between China and the US

US: United States

WTO: World Trade Organization

1. INTRODUCTION

1.1 CHAPTER OVERVIEW

This chapter is the introduction of this research. This chapter mainly introduces the topicality of the issue, thesis outline, reasons for choosing the subject, research questions, research objective, research hypothesis, contribution and significant of the study.

1.2 TOPICALITY OF THE ISSUE

The issue of Sino-US trade imbalance is not only the focus concentrated by the two countries but also a hot issue of common concern to the whole world. The adjustment of Sino-US trade imbalance is crucial to both the economic balance between the two countries and the rebalance of the global economy. Trade between China and the United States is a significant part of global economic development and trade development, and trade deficit of the world mainly occurs in the United States, with the deficit of US current account occupying 70% of the world's total imbalance. China runs the largest trade deficit with the United States. During the economic globalization, the trade cooperation between China and the United States has been persistently deepened. In 2004, the United States surpassed Japan and became China's second largest trading partner. After becoming the second largest trading partner of the United States in 2006 which ranked only second to Canada, China surpassed Canada in 2015 and became the largest trading partner of the United States for the past four years. The total volume of bilateral trade between China and the United States hit a record high of $659.8 billion in 2018, exceeding the previous record of $658.1 billion set by Canada in 2014. The increasingly close economic and trade cooperation also gave prominence to the Sino-US trade imbalance, which consequently led

to the Sino-US trade war. China was overtaken by Mexico and became the second largest trading partner of the United States in 2019 on account of the escalating trade war between China and the United States. Meanwhile, the United States was also surpassed by ASEAN and became the third largest trading partner of China. According to the data released by China's General Administration of Customs, China's import and export with ASEAN totaled 4.43 trillion Yuan, with an increase of 14.1%; while China's import and export with the United States totaled 3.73 trillion Yuan, with a decline of 10.7%. Obviously, the issue of Sino-US trade imbalance affects the import and export trade between China and the United States. The Sino-US trade imbalance is a long-standing issue, which arises with the establishment of the economic and trade ties between the two countries and is aggravated with the expansion of bilateral trade scale. Long-term trade imbalance has not only led to a series of economic issues, but also in recent years, the Sino-US trade imbalance has gradually evolved from an economic issue into a political issue. Due to the severity and urgency of this practical issue, many scholars have also conducted relevant research on it, but they have not reached a complete agreement on the reasons for the Sino-US trade imbalance. On the one hand, they have analyzed the root of the Sino-US trade imbalance from the perspective of industrial transfer, and there is a consensus reached in the academic circle that with the continuous transfer of the international division of labor, industries in developed countries and regions conduct resource allocation in the world for cost reduction, and China has carried on international industrial transfer on account of the open trade policy and low labor cost, which led to the scale expansion of China's exports. On the other hand, there are still differences exist when analyzing the reasons for the Sino-US trade imbalance from the perspective of exchange rate. Cline (2010) deemed that the RMB exchange rate has a significant impact on the Sino-US trade balance. If the real exchange rate of RMB appreciates by 1%, China's surplus reduces by 0.3% to 0.4% of the GDP. If the real exchange rate of RMB appreciates by 10%, the Sino-US trade surplus reduces by 170 billion to 250 billion US dollars, and accordingly the US deficit reduces by 22 billion to 63 billion US dollars [1]. David Hale and Lyric Hale (2008) considered that despite Washington had been pressuring RMB for appreciation so as to settle the trade deficit, RMB was not the reason for Sino-US trade imbalance, and what we should pay attention to

was how to integrate China into the global economy [2]. Greenspan (2003) also refuted the argument that the RMB was undervalued, and he believed that the appreciation of RMB would not contribute to reverse the US trade deficit [3].

Based on the method of empirical analysis, this thesis attempts to dissect the issues of Sino-US trade imbalance in a comprehensive and profound way.

1.3 THESIS OUTLINE

This thesis is divided into 7 chapters.

The first chapter introduces topicality of the issue, thesis outline, reasons for choosing the Subject, research questions, research objectives, research hypothesis, as well as the contribution and significance of the research.

The second chapter analyzes the overall situation of the Sino-US trade development. First, it arranges the evolution of the Sino-US trade relations, which is generally divided into four stages: a review of Sino-US trade from the Qing Dynasty to the Chinese People's War of Resistance against Japanese Aggression; a review of Sino-US trade from the period during the Chinese People's War of Resistance against Japanese Aggression to the establishment of the People's Republic of China; a review of Sino-US trade from the founding of the People's Republic of China to the establishment of Sino-US diplomatic ties; development and vicissitudes of trade between the two countries since the establishment of diplomatic relations. Second, in terms of the total volume of trade, China's trade surplus with the United States keeps accelerating, showing that China's exports are becoming increasingly dependent on the US market, which also aggravates the asymmetry of Sino-US trade relations. However, the asymmetry of trade relations also brings great uncertainty and risks to the development of China's economy and foreign trade. Finally, it is found that the Sino-US trade imbalance serves as the most important obstacle to the

development of Sino-US trade relations, as well as the immediate cause of the Sino-US trade war.

The third chapter serves as the theoretical framework of the research. First, this part shows the definition of international balance of payments based on "Balance of Payments Manual" formulated by the International Monetary Fund, which draws forth the details of trade balance and trade imbalance. There are relevant theories on trade imbalance, which principally contain Mercantilism Theory, Theory of Absolute Comparative Advantage and Relative Comparative Advantage, Theory of Reciprocal Demand, Theory of Factor Endowment, Theory of Free Trade and Protective Trade, Elasticity Approach, Absorption Approach and Monetary Approach, etc. Then it critically reviews that previous research aims to capture and analyze different ideas and opinions concerning the topic. Moreover, it aims to propose different views in an impartial and comprehensive way, so as to conclude the achievements and significance of previous research. From the research of the Sino-US trade imbalance by scholars, government agencies and research institutions, I have found that they are more and more aware of the Sino-US trade imbalance which is no longer a superficial issue reflected by trade figures, but is an issue of dynamic imbalance influenced by multi-factors.

Chapter 4 makes an introduction to the methodology of this research. It adopts the method of quantitative research for data collection and analyzes the Sino-US trade imbalance by econometric model and analysis software such as Eview and Excel. Meanwhile, based on the method of qualitative research, it analyzes the regularity issues of the Sino-US trade imbalance by historical analysis, documentary analysis, and case study and so on. The combination of quantitative analysis and qualitative analysis can strengthen the validity and reliability of the research. Besides, there are also difficulties and limitations of the research concluded in this chapter.

Chapter 5 discusses the factors of Sino-US trade imbalance, and it focuses on the macro-economic factors of savings and exchange rate, as well as macro-economic

coincident indicator of foreign direct investment, for analysis by model establishment and EVIEWS. There are also other factors which affect the trade imbalance between China and the United States discussed in this part, such as the composition of trade, trade policy, industrial transfer, statistical methods and mode of trade, etc., and collected data has been analyzed by excel based on a large number of descriptive statistical data.

Chapter 6 gives a discussion on the influence of Sino-US trade imbalance. First of all, it discusses the impact of Sino-US trade imbalance on China. It conducts research respectively from the effect of Sino-US trade imbalance on employment in China, upgrading of industrial structure, technological advancement and economic benefits, among which the economic benefits for China in the Sino-US trade imbalance are mainly discussed by economic demonstration. Moreover, it discusses the immediate consequence brought by the Sino-US trade imbalance – Sino-US trade friction. Finally, this chapter establishes a model for the prediction of subsequent trade imbalance between China and the United States in the short run.

Chapter 7 introduces the conclusion of this research.

1.4 REASONS FOR CHOOSING THE SUBJECT

The Sino-US trade imbalance is not only the focus concentrated by the two countries, but also a hot issue of common concern to the whole world. The adjustment of the Sino-US trade imbalance is vital to both the economic balance between the two countries and rebalance of the global economy. In choosing to address this topic in my doctoral research, I have driven by diverse motives. Following a summary of the most important motives for choosing the subject:

From an academic point of view:

Despite there are many discussions on the bilateral imbalance between China and the United States in the academic circle, there are few empirical studies on the Sino-US trade imbalance from the perspective of macro-economic factors and the coincident indicators of foreign direct investment, as well as empirical analysis from the aspects of trade benefits and economic disparities. For instance, as the economic globalization accelerates the economic and trade relations among various countries have become increasingly close. The research of bilateral trade imbalance between China and the United State requires not only conducting from the bilateral perspective, but also considering over the impact on the Sino-US trade imbalance brought by foreign direct investment of other countries. Does China's persistent surplus in the Sino-US trade certainly narrow the economic disparity between China and the United States? Does the persistent trade deficit of the United States in the Sino-US trade necessarily speed up its economic growth reduction? Which has the greater impact on the bilateral trade imbalance, savings or exchange rate? These have been less involved in previous research.

From a practical point of view:

The increasingly rise in the Sino-US trade imbalance has led to frequent trade frictions between the two countries. Various anti-dumping lawsuits brought by the United States against China have been on the rise, and the Sino-US trade imbalance has even become a crucial factor which affects the political stability of the two countries. Dealing with the bilateral trade imbalance properly is conducive to reducing bilateral trade frictions, which is of great practical significance to study the global trade imbalance.

From a personal point of view:

I am interested and willing to explore this issue. I majored in accounting during the period of undergraduate, and I have a strong interest in balance of payments. During the period of master, I learned international economics and business. While analyzing the bilateral trade friction, I came to know that figuring out the trade imbalance is the key to solve the issue

of trade friction, and it was also at that time that I had my first idea for my current research issues.

1.5 RESEARCH QUESTIONS

What are the factors to the Sino-US trade imbalance? Are macro-economic factors the most important?

What impact has the Sino-US trade imbalance brought to the two countries?

What kind of adjustment mechanisms may work as regards the Sino-US trade imbalance?

How national economic policies influenced the development of the balance.

What the governments can do to improve the situation.

1.6 RESEARCH OBJECTIVE

To find the main elements of Sino-US trade imbalance.

To find the consequences of Sino-US trade imbalance.

To find measures to deal with Sino-US trade imbalance.

1.7 RESEARCH HYPOTHESIS

1st hypothesis: Solely from the perspective of trade goods, it seems that China is actively

developing and exporting capital-and technology-intensive goods to the U.S., which do not follow the comparative advantage.

2nd hypothesis: The habit of savings for Chinese people and the Chinese government's incentives for foreign direct investment serve as the vital factors which incurred the bilateral trade imbalance.

3rd hypothesis: Mercantilism has certain one-sidedness. In spite of the persistent surplus in bilateral trade that China has sustained, China remains a weak position in the distribution of trade benefits, which objectively increases the economic disparity between the two countries.

1.8 CONTRIBUTION AND SIGNIFICANT OF THE STUDY

Global economic imbalance has become one of the hot topics in academic research. As an important issue of global economic imbalance, Sino-US trade imbalance is a prominent issue in the development of contemporary world economy and has become a major hidden danger affecting Sino-US political and economic relations. A comprehensive research of the Sino-US trade imbalance for figuring out effective solutions to the Sino-US trade imbalance not only contributes to settling out the trade friction between China and the United States, but also guarantees the healthy and stable development of bilateral economic and trade relations in the future. Despite there are many discussions on the Sino-US bilateral imbalance in the academic circle, there are few empirical studies on the Sino-US trade imbalance from the perspective of macro-economic factors and the coincident indicators of foreign direct investment, as well as empirical analysis from the aspects of trade benefits and economic disparities. Thereby, more research in such direction occurs in the paper.

In practical terms, the research achievements and recommendations are available for

decision makers at the first level in Chinese government and trade associations and organizations, which provide convenience to utilize these results and recommendations while making decisions, so as to facilitate the balanced development in bilateral trade and reduce Sino-US trade friction.

Theoretically, this thesis contributes to the already existing body of knowledge and present literature in the area of Sino-US Trade Imbalance. Hopefully, it will aid further academic research in the field in question.

1.9 SUMMARY

In conclusion, the introduction presents an accurate and brief description of this research in part, which includes the topicality of the Issues, thesis outline, reasons for choosing the subject, research questions and research Objectives and research hypothesis, as well as the contribution and significance of the research.

Global economic imbalance has become one of the hot topics in academic research. As an important issue of global economic imbalance, Sino-US trade imbalance is a prominent issue in the development of contemporary world economy and has become a major hidden danger affecting Sino-US political and economic relations. A comprehensive research of the Sino-US trade imbalance for figuring out effective solutions to the Sino-US trade imbalance not only contributes to settling out the trade friction between China and the United States, but also guarantees the healthy and stable development of bilateral economic and trade relations in the future.

2. HISTORY OF TRADE BETWEEN CHINA AND USA

2.1 CHAPTER OVERVIEW

This chapter analyzes the overall situation of the development of the Sino-US trade. First, the evolution process of Sino-US trade relations is divided into four stages: Sino-US trade review from the Qing Dynasty to the Anti-Japanese War; Sino-US trade review from the Anti-Japanese War to the establishment of People's Republic of China; Sino-US trade review from the establishment of People's Republic of China to the establishment of Sino-US diplomatic relations; the development and change of Sino-US trade after the establishment of Sino-US diplomatic relations. Second, from the perspective of total trade volume, China's trade surplus with the U.S has been constantly increasing, which indicates that Chinese exports are increasingly dependent on the American market, and aggravates the asymmetry of Sino-US trade relations. The asymmetry of Sino-US trade relations has also brought great uncertainty and risk to the development of China's economy and foreign trade. Finally, the trade imbalance between China and the U.S. is the major obstacle to the development of Sino-U.S. trade relations as well as the direct cause of Sino-US trade war.

The exchanges between China and the U.S. started from the trade in the late 18th century. The Qing government of China (1644-1912) and the American government officially recognized each other in 1844. [4]

2.2 THE SINO-US TRADE FROM THE QING DYNASTY TO THE ANTI-JAPANESE WAR

The Sino-US trade from the Qing Dynasty to the Anti-Japanese War can be roughly divided into four stages.

The first stage is the informal or non-treaty contact period from 1784 to 1844. The development of American shipping promoted the trade with China during this period. The Empress of China arrived in Guangzhou in 1784 ushered in a new era of Sino-US trade. The United States Congress formulated the early customs duty clauses to encourage direct US import from China. After the outbreak of the French Revolution, the European wars accelerated the development of Sino-US trade. The U.S. re-exported the imported Chinese tea to Europe and thus expanded the Chinese tea market. American furs, sandalwood and other products sold well in Chinese market, which promoted the leaping development of the trade between the two countries. The end of the war between Britain and the U.S. in 1812 stimulated the U.S. trade with China. Cotton, opium, tea and silk were the main traded goods during this period. [5]At that time, since China adopted an attitude of rejecting foreign objects, it was unable to accept a large number of foreign products and naturally had little demand for American products, which led to China's long-term trade surplus with the U.S. at that time. In order to compensate for this trade balance, the U.S. first sold British cotton cloth and eventually even smuggled opium to China.

In 1805 or earlier, the American merchants transported opium from Turkey for sale. In that year, the American merchants transported 124 bags and 51 boxes of opium, and exported 102 boxes of them to China in 1806, 180 boxes in 1807 and 1,741 boxes in 1829. [6] The import of opium caused the outflow of a large amount of silver from China, led to the decline of China's purchasing power and affected the export of American manufactured goods to China. In 1839, the value of American exports to China was $1.53 million, and that of Chinese exports to the U.S. was $3.68 million. The China and Britain Opium War broke out in 1840, and the Qing government signed the Treaty of Nanjing with Britain on August 29, 1842, which endowed Britain with a lot of privileges. Affected by Britain, the U.S. and the Qing government signed the Treaty of Wangxia on July 3, 1844, which marked the start of unequal Sino-US trade and the end of early Sino-US trade relations. [7]

The second stage is the period of temporary expansion and continuous decline from 1845 to 1894. Affected by Taiping Heavenly Kingdom Movement, China's national purchasing power was reduced. Meanwhile, affected by the civil war, the American shipping industry declined, and the American government raised tariffs to increase national revenues, which hindered the development of Sino-US trade. The reasons for the slow development of trade during this period include: (1) the recession of American shipping industry; (2) the establishment of restrictive trade tariff system in the U.S.; (3) the depression of American business in China; (4) the competition from Japanese tea and silk products; (5) the fall of silver price; (6) the aversion between China and the U.S. caused by China's labor problems and the Chinese Exclusion Law. [8]

The third stage is the period of turbulent situation and fierce competition from 1895 to 1913. The Treaty of Shimonoseki signed after the Sino-Japanese War led to a greater degree of opening up in the Chinese market. In the absence of tariff protection, the open Chinese market brought a devastating blow to the domestic industry and commerce. The competition of Western powers for the priority of trade in China gave rise to the chaos in China's foreign trade, and China's industrial development, loans and trade were controlled and restricted by various European countries. The U.S. exports to China severely declined, but its imports from China increased steadily. During this period, cotton cloth, refined mineral oil, cigarettes and tobacco and steel machinery were the main exports from the U.S. to China, and the main imports from China to the U.S. were raw materials or semi-finished products supporting the American industrial production, including silk, tea, wool and peltry. [9]

The fourth stage is the rapid expansion period from 1914 to 1922. The outbreak of the First World War cut off the material supply from Europe to China, and the U.S became the main trade partner of China. In order to supply war products, the American industry imported a large number of Chinese raw materials. In 1913, the American Tariff Act reduced or exempted the import taxes on lots of raw materials and commodities; moreover, the rise of

silver price stimulated the U.S. to import Chinese goods. In 1913, the total amount of U.S. imports from China was $41.387 million, which increased to $176.471 million in 1923, with the growth rate increased from 100% to 427%. Except for 1921, China had been in a surplus status in Sino-US trade. During this period, the main competitors of the U.S. in China were Britain and Japan, and other European countries were eliminated from the Chinese market due to the outbreak of war. [10]

2.3 SINO-US TRADE FROM THE OUTBREAK OF ANTI-JAPANESE WAR TO THE ESTABLISHMENT OF PEOPLE'S REPUBLIC OF CHINA

In 1931, Japan began its invasion and unbridled plunder in China, the trade in the occupied areas was rapidly colonized, and the development of Sino-US trade was restricted. In 1932, the volume of Sino-US trade was less than one-third of that in 1929, and until the victory of the Anti-Japanese War, the maximum volume of Sino-US trade only reached about half of that in 1929. After the victory of the Anti-Japanese War, the U.S. replaced the position of Japan and attempted to turn China into its vassal, so it stepped up its political and economic penetration into China, and made China the source of its raw materials and the dumping place of its products. Especially, the signing of the *Sino-US Friendship and Mutual Assistance Treaty* in 1946 provided favorable conditions for the U.S. to control China's foreign trade.

Table 1: Volume of Sino-US Trade from 1945 to 1949

Hundred Million Dollars

Year	Trade Volume	Chinese Exports	Chinese Imports
1945	1.14	0.06	1.08
1946	5.58	0.93	4.65

1947	4.70	1.17	3.53
1948	3.93	1.20	2.73
1949	1.90	0.83	1.46

Source: Zhou, 1989, P29 [11]

It can be seen from the above table that after the victory of the Anti-Japanese War, the volume of Sino-US trade increased rapidly and reached the historical maximum value of $558 million in 1946. After that, with the increasingly shrinking of the Kuomintang-controlled areas, the trade volume gradually declined. During this period, China's trade with the U.S. was in a deficit status and achieved import surplus every year.

2.4 SINO- US TRADE FROM THE ESTABLISHMENT OF PEOPLE'S REPUBLIC OF CHINA TO THE ESTABLISHMENT OF SINO-US DIPLOMATIC RELATIONS

This is a suspension period of Sino-US trade. From the founding of the People's Republic of China in 1949 to 1970, the trade between China and the U.S. was in a state of suspension. The People's Republic of China was established in 1949, but the U.S. did not recognize it, and required some western countries to be on the side of it and not recognize the legal status of China. In 1950, the Korean War broke out, the military confrontation between China and the U.S. extended from the battlefield to the field of economy and trade. The American government took a series of political and economic measures to sanction China, and implemented cargo embargo on China, which completely suspended Sino-US trade for more than 20 years. When the new China was just established in 1949, China and the US still maintained some trade contacts. In 1949 and 1950, the bilateral trade volume of the two countries was respectively $199 million and $238 million. [12]

Then the trade relations between China and the US were suspended, according to the following chart, the value of trade between China and the US was just symbolic 7.99 million dollars in 1951, which decreased to 53 thousand dollars in 1952 and to 2 thousand dollars in 1953 even more. There was no direct commercial intercourse from 1954 to 1970.

Table 2: The value of trade between China and the US from 1950 to 1970

10thousand dollars

Year	Total volume of trade	The export amount of China	The import amount of China
1950	23812	9549	14263
1951	799	8	791
1952	5.3	0.3	5
1953	0.2	0.2	0
1954-1970	0	0	0

Source: Huang, 2005, P191 [13]

The restoration period of the Sino-US trade

In the early 1970s, there were huge changes of global political and economical situation, the strength of the US declined relatively, economically, the US was undergoing the economic crisis and stagflation, faced the aggressive attacking of the Soviet Union in politics and military science, the US flinched, so that the diplomatic policy of the US, especially for the policy to China, changed obviously. Because the US needed to combine China to contend against the Soviet Union, so the hostile attitude to China was abandoned. The president Nixon issued a statement in 1971 that adopted practical measures to restore the trade between China and the US gradually and relieved the embargo of China. Though the value of trade between China and the US in that year was just 5 million dollars, it

represented the trade relations between China and the US which had suspended 21 years started to restore and develop. Until Nixon visited China in 1972 and issued China-US Joint communique, the trade between China and the US began to develop rapidly. According to the following chart, the value of trade between China and the US increased 76 times, which increased to 992 million dollars in 1978 from 13 million dollars in 1972.

Table 3: The value of trade between China and the US from 1972 to 1979

100 million dollars

Year	Total volume of trade	Chinese export	Chinese import	Balance of trade
1972	0.13	0.10	0.03	0.06
1973	2.60	0.40	2.21	-1.81
1974	4.76	1.03	3.73	-2.70
1975	4.71	1.29	3.42	-2.13
1976	3.17	1.56	1.61	-0.05
1977	2.94	1.80	1.15	0.65
1978	9.92	2.71	7.21	-4.50

Source: China Commerce Year Book 1984[14]

The trade between China and the US in this term can be generally divided into 3 stages. The first stage is from 1972 to 1974, which is the rapidly restoration and developing stage after the rebuilding of their trade relations. Though the trade base between China and the US in this term is small, it grows fast. As we can see from Table 3 the growth rates in these three years are 160%, 1900% and 83% respectively, the growth of trade exceeded 35 times. The rapid growth of Sino-US trade in this term is benefited by the rapid improvement of the relations between China and the US. President Nixon took the improvement of the relations with China as the core of diplomatic policies; while China was isolated again

after the Soviet broke with China and the diplomatic blunders in initial time of the Great Culture Revolution, in order to break that barrier and confront the threat of the Soviet Union, the improvement of Sino-US relations was also the important try of China. The second stage is from 1975 to 1977, in this stage, the development of the relations between China and the US was in trouble, because the Watergate scandal that led to the resignation of President Nixon and better relations between the US and the Soviet Union, the US attached less importance to the relations between China and the US; meanwhile, the wrong thought of left-leaning in China in this term broke the diplomatic policies and made the attitude of China to the US more cautious. With the stagnation of the development of the relations between China and the US, Sino-US trade was also affected, the value of trade constantly declined that the value of trade in 1977 was just equal to 62% of the value in 1974. China was in “import surplus” state. The third stage is the establishment of Sino-US diplomatic relations in 1978. In the late 1970s, with the global expansion of the Soviet Union, the relations between the US and the Soviet Union became worse, the US pointed at China again; moreover, the trade agreement signed by China and Japan and the EC also stimulated the US. After the Great Cultural Revolution in October, 1976, China had transferred the core of work to economic work; the normalization of the relations with the US was also the intrinsic requirement of developing Chinese economy. Hence, the relations between China and the US began to improve rapidly and the trades also develop rapidly, the value of trade in 1978 reached 992 million dollars, which is more than 3 times of 1977.

According to the table, the main feature of Sino-US trade in this term is that China was in trade deficit and it constantly enlarged as the time goes by. The main reasons are: the first one is that China adopted fixed system before the reform and opening-up, though it constantly adjusting the depreciation of US dollar, RMB was overrated seriously, and the huge domestic and foreign price difference suppressed the export of China. The second one is that the competitiveness of Chinese product is low, meanwhile, the long-term reclusive state led to that the US market and trade policies were known not very well by China, which blocked the export of China to the US. The third one is that in this term, China not

only imported machinery equipment from the US to develop the industry, but also imported a good deal of agricultural products from the US to satisfied domestic consumption demand. So every year is the excess import year, except for 1977, the year when the relations between China and the US shrunk most.

2.5 THE CHANGES OF TRADE DEVELOPMENT OF THE TWO COUNTRIES AFTER THE ESTABLISHMENT OF SINO-US DIPLOMATIC RELATIONS

After the establishment of Sino-US diplomatic relations, the economies of the two countries spent 10 years' "honeymoon", the relations of economy and trade in this term reflected the developing situation of the political relations of the two countries, which are political tool. Frictions such as most-favored-nation clause, market access and intellectual property appeared entered into 1990s, while the fluctuation and friction of the two countries' political relations had not influenced the trade development of the two countries, no matter refer to the statistics of China or the US, the trade of the two countries from 1989 to 2000 has constantly growing, which the trade relations of the two countries gradually free from the constraint of the political relations of the two countries and entered into rapid developing stage. After China entered into WTO in 2001, the Sino-US trade relations entered into mature development stage, then the export of China to the world and the US appeared explosive growth for ten years. Benefited from the sharp increasing of export, a large number of surplus labors in rural China can go to coastal cities and work in export-oriented light industry enterprises, as many as 800 million people free from poverty because of that. Though the growth speed of export of China to the world and the US has slow down since 2012, supported by the US, the economic achievement acquired by China after entered into WTO cannot be underestimated. [15]

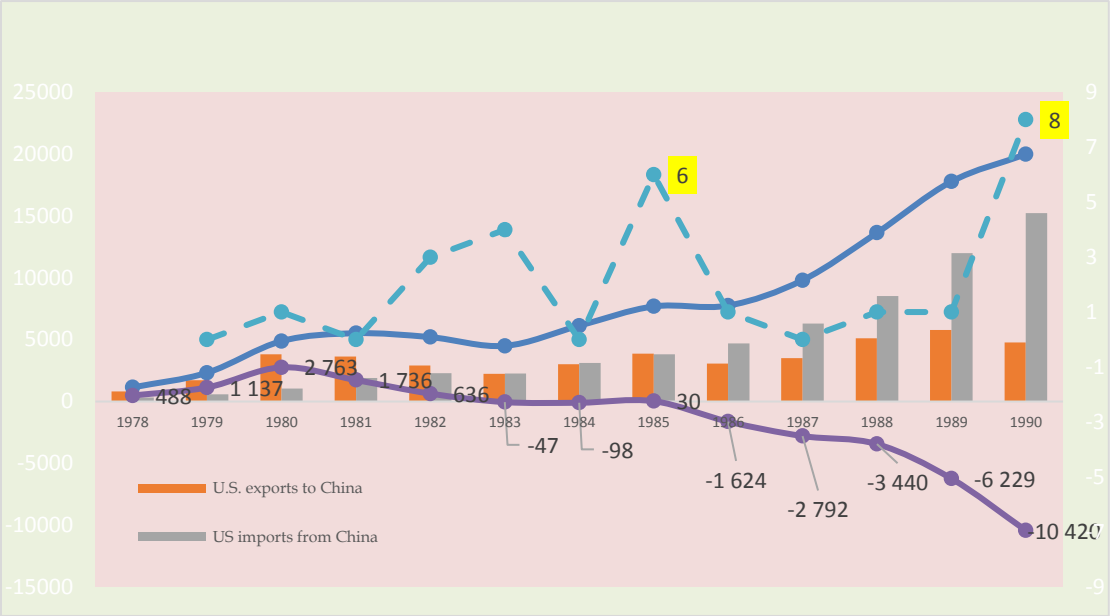
The Sino-US trade speeds up recover and it entered into normal developing stage. China

and the US formally established diplomatic relations on January 1st, 1979, soon after that, the state leaders of China Deng Xiaoping had visited the US on January 28th, 1979, they exchanged the views about international situation, property right and most-favored-nation clause and signed consul, trade, scientific and cultural exchange agreements. Sino-US trade developed rapidly after Deng Xiaoping visited the US, the enterprises of the two countries contacts frequently, a series of agreements that promote Sino-US trade development were also be signed, include *the Agreement about Holding Trade Exhibition of the People's Republic of China and the United States of America* and *the Trade Relations Agreement of the People's Republic of China and the United States of America.*[16] The two countries signed the 3-year *Sino-US Trade Agreement* on July 7th, 1979, and decided the most-favored-nation tariff was provided mutually from February 1st, 1980 that made normalization for Sino-US trade. After Deng Xiaoping visited the US, the vice president of the US Walter f. Mondale visited China from August 25th, 1979 to September 1st, they signed cooperative agreements of enlarging cultural exchange and hydroelectric generation during that period, meanwhile, the US decided to set up consulate in Guangzhou and Shanghai to promote the trade cooperation and communication of China and the US.

2.5.1 The Development of Sino-US Trade from 1978 to 1990

Figure 1: China's Merchandise Trade with the United States and U.S Merchandise Trade with China, 1978-1990

Measurement unit: millions of dollars



Source: Figure is drawn basing on data from the US Department of Commerce.

Figure shows that during 10 years after the establishment of Sino-US diplomatic relations in 1979, both export from the US to China and import from China to the US have achieved significant increase and total bilateral trade amount also has gained large growth. After 1980, the amount achieved a huge leap. The amount of export from America to China increased to $3.823 billion in 1980 from $1.732 billion in 1979, while the amount of import from China to America raise up to $1.06 billion in 1980 from $0.6 billion in 1979. This increase could be partly attributed to America's change in its import regulation policy about China. According to related rules in Export Control Act, America divided its trade partners into several classes including Z, S, Y, W, Q, T and V. From left to right, each class embraced more relaxed regulation. China was in Y class with strict regulation on technology export before 1980. As China-US diplomatic relations became better, the US moved China to Q class. In 1983, concerning more about political matters, Export Control Act Amendment provided more relaxed rules on Chinese technology transfer. In 1986, China became the biggest provider of software technology to America.

Figure shows that trade friction and conflict were unavoidable while glorious bilateral trade cooperation between China and the US was achieved. In the early days after the development of Sino-US diplomatic relations, United States trade with China was in surplus. But after 1983, trade surplus turned into deficit which grew up from only $47 million in 1983 to $6.23 billion in 1989 with growth of as much as 132 times. What is more, US foreign trade was in deficit as a whole. Under such a condition, America emerged domestic trade protectionism which led to disharmony between China-US trades. Statistics in figure presents that from 1980 to 1989, United States Department of Commerce and International Trade Commission have launched 17 anti-dumping investigations against China's goods in various sectors, such as chemical engineering, steel, textile and the like. Among them, the textile industry was deeply damaged.

Apart from the economic reason of trade deficit, political factors also played an important role in bilateral trade and commercial relations. Due to the short time after establishment of China-US diplomatic relations, considering the differences of ideology and state character between two countries, the United State put a cautious and prudent attitude to China, and communist state, which was mainly presented in a special regulation aiming at "Communist states", the 406th article in US *Trade Act of 1974*. This regulation stipulated that president has privilege to take measures to such communist states, which means that when International Trade Commission conducts a survey according to the 201 Article, if exported goods disturb and threaten the US products of the same kind, president has right to take temporary emergency actions to restrict import of this kind of goods from most non-market-economy countries even though ITC investigation does not finish.

Because of a series of complicated international political affairs like Revolutions of 1989 and disintegration of the Soviet Union, America imposed five sanction measures on China and political and economic cooperation between two states stopped, which did great harm to bilateral trade exchange. Figure also shows that in 1990, US export to China declined almost $1billion.

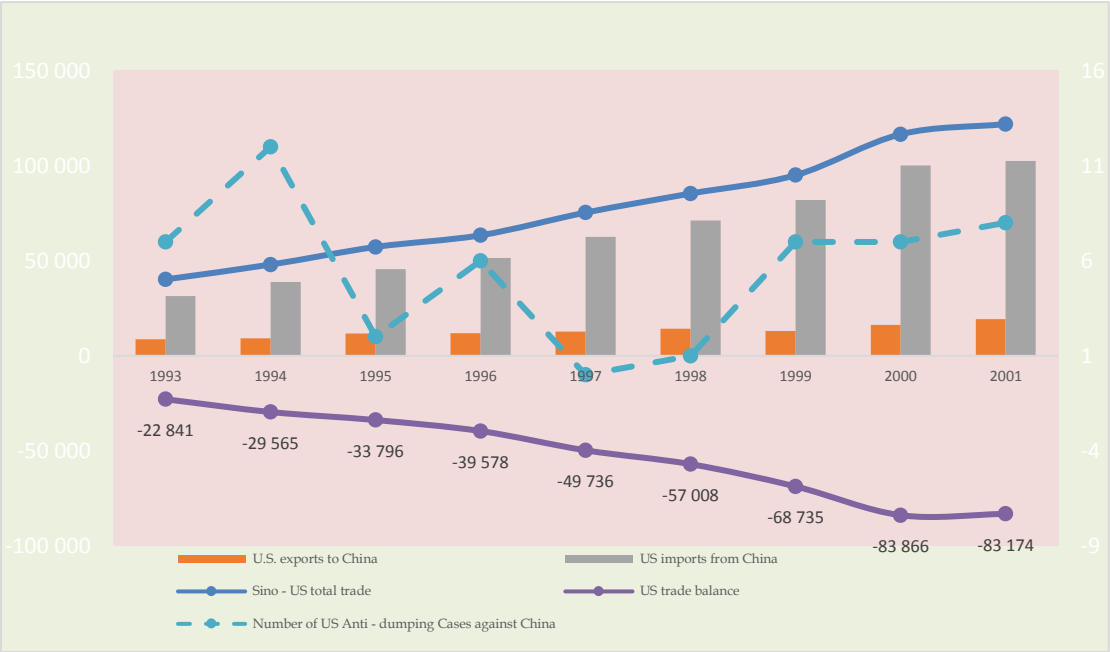
2.5.2 The Development of Sino-US Trade in the William Jefferson Clinton period (1993.1-2001.1)

As China deepened open policy, like the development of Shanghai Pudong New Area in 1990s, and enhanced its international strength, China-US relations of trade transferred to an inter-permeated and interdependent cooperative partnership from simple China's relying on import from the United States.

In order to adapt to the needs of foreign strategic transformation and industry upgrade, Clinton implemented Package Program of "New Economy" policy after his taking over power in 1993. Clinton changed the foreign economic principle from approving "free trade" to pursuing "fair trade", put forward "National Export Strategy" for the first time in history, and reinforced interference in export and protection to domestic companies, striving for more export chances for them. What's more, Clinton also enhanced the implementation of Comprehensive Trade Act of 1988 and the "Special 301 Article" in it, sanctioned countries having trade friction with the US, practiced trade policy of "multi-track system" and advocated combination of trade cooperation and communication which specifically presented in promoting operation of North American Free Trade Area, the development of Asia-Pacific Economic Cooperation and multilateral and regional trade cooperation such as GATT and Uruguay round of negotiation.[17]

Figure 2：China's Merchandise Trade with the United States and U.S Merchandise Trade with China, 1993-2001

Measurement unit: millions of dollars



Source: Figure is drawn basing on data from the US Department of Commerce.

Figure shows that Sino-US trade situation is good in the Clinton period, featuring that exports to China, the imports from China, and the overall Sino-US trade volume all show a rapid growth trend. American exports to China increased from $ 8.7 billion in 1993 to $ 19.4 billion in 2001, an increase of 1.23 times in nine years. The US imports from China also increased significantly, from $ 31.5 billion in 1993 to $ 102.6 billion in 2001, an increase of up to 2.26 times, so we can see that with the deepening of Sino-US trade, the dependence of the United States on China's import has been more than China's dependence on US imports, and it's fully validates the increasingly permeable Sino-US economic and trade relations between them. In May 2000, based on the bright situation, China and the United States reached a consensus that the trade relations between the two sides upgrade from the "MFN" to "permanent trade partnership", which can be described as icing on the cake.

Figure shows the deficiencies in Sino-US economic and trade cooperation can be found. Obviously, the US trade deficit with China has increased year by year, and it has been a tendency continues to expand, which soars from $ 22.8 billion in 1993 to the $ 82.3 billion

in 2001, increasing nearly two times. Under such a situation, the United States has carried out up to 50 anti-dumping investigation cases on China in 9 years, with an average of more than 5 and the highest number is 12 in a year. On the one hand, this is affected by the widening trade deficit; on the other hand, it is mainly due to the political sensitivity of both sides. Many factors such as President Bill Clinton, a leader of the Democratic Party, was often influenced by internal anti-China forces, the political interests and positions of the two sides are also different on the Taiwan issue, the United States, as a powerful political power, has repeatedly intervened in China's internal affairs, etc. have worsen the political relation between China and the United States. However, with the deepening of economic globalization and the refinement of the international division of labor, the interference of political factors on economic cooperation tends to be weakened, and trade cooperation and exchanges tend to be rational and basically maintain a stable growth situation, which reflects that the US trade policy toward China was affected by the main interest of Sino-US trade cooperation and investment.

2.5.3 The Development of Sino - US Trade in the George Walker Bush Period (2001.1-2009.1)

In 2001, George Walker Bush was elected as the new president and reappointed in four years later. During the eight-year term, he was affected by various emergencies. Therefore, the Sino-US relation had ups and downs and went through about three stages. It’s a low tide of Sino-US relation in January to September of 2001. In the early days of George Walker Bush's entry into the White House, the US government adopted a tough policy on China between "ring-fence" and “contact”, he rose that China and the United States are “strategic rivals” rather than "strategic partners" in the Clinton period. In view of human rights issues, Hainan collision incident and the Taiwan issue, there are conflicts in different levels between China and the United States, resulting tension between the two sides. Figure shows that US exports to China, imports from China, the trade balance and the total

value of Sino-US trade was essentially flat in the first three quarters of 2001, and there are few fluctuations among the three quarters.

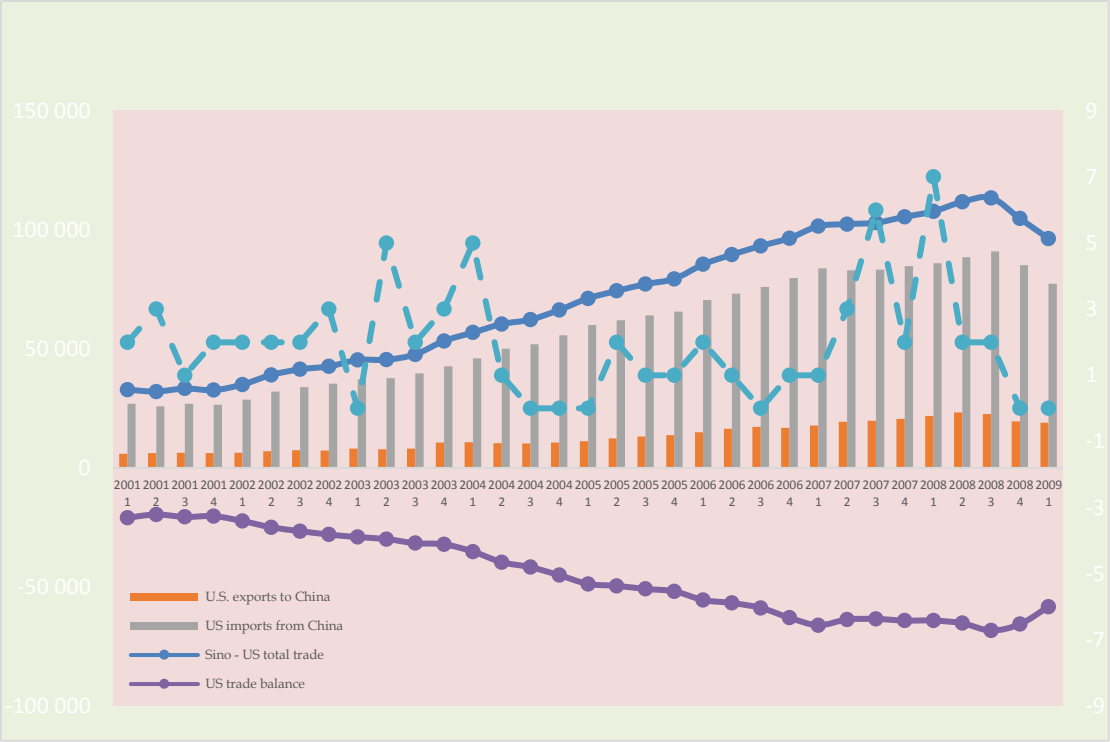
It is a recovery period of the Sino-US relation from October 2001 to February 2005. The "911" incident compelled the United States to adjust its foreign strategy, and Bush quickly regarded safeguard national security and combat terror as an important task in his political career while he was aware of that China is an important alliance of the anti-terrorism forces. At the APEC meeting in October 2001, George Walker Bush formally proposed that the two sides need to establish a "constructive cooperative relationship" to strengthen cooperation and exchange in politics, economy, trade and military affairs. China became a member of the WTO in December 2001, and the United States announced China's permanent normal trade relation (PNTR) on December 17 in the same year, which can reflect the key role of the United States in promoting China to achieve a major breakthrough in the field of international trade. Figure shows that there was a significant change of the trade volume compared with the previous three quarters of 2001. The US exports to China rose from $ 6.2 billion in the fourth quarter of 2001 to $ 11.2 billion in the first quarter of 2005, nearly doubling and breaking through $ 10 billion in the fourth quarter of 2003. US imports from China also showed a rapid growth trend, which gradually increased from $ 26.5 billion in the fourth quarter of 2001 to $ 60 billion in the first quarter of 2005, an increase of 1.3 times. Corresponding to the increasing US trade deficit, there are 8 to 9 anti-dumping cases annually for obvious trade imbalance against China. However, the total trade between the two sides is also growing.

Sino-US relation developed steadily from March 2005 to December 2008. With the victory of the Iraq war, the United States shifted its attention to the rise of China, the announcement on Taiwan issue and the policy of "encourage India and restrain China" showed its defense awareness against China. There also appeared some disputes during their cooperation and development in economic and trade, including the United States exerts pressure on the appreciation of China's Yuan, protect intellectual property rights and

punish infringement. Figure shows that the development trend of trade between China and the United States is basically the same as that of the recovery period. However, the anti-dumping case of US against China in 2005 and 2006 decreased rapidly but increased to 12 cases in 2007, while countervailing investigation cases developed from nothing, which may because the increasing trade deficit and pendulous policy towards China.

Figure 3: China's Merchandise Trade with the United States and U.S Merchandise Trade with China, 2001-2008

Measurement unit: millions of dollars



Source: Figure is drawn basing on data from the US Department of Commerce.

2.5.4 The Development of Sino-US Trade in the Obama term (2009.1-2017.1)

In January 2009, Obama took the office, and it's a key period to prosper the economy after the outbreak of the financial crisis in 2008. The situation of internal and external difficulties make the United States has to re-examine and adjust its foreign trade policy. As early as the presidential election campaign, to fight for votes, Obama, as a leader of the

Democratic Party, adheres to implement a more stringent trade protection policy and criticize many shortcomings of the free trade, but he positively positioned that the Sino-US relation is “non-friend and non-enemy” after he was elected, which can be seen in Figure.

According to the US-China quarterly trade volume data, the US exports to China, imports from China shows a growth trend besides few occasionally decline in the period, and the overall trade volume also grows rapidly which won’t be repeated here. We can see a trend of increase and mutual-benefit in mutual-probe of Sino-US economic and trade relation.

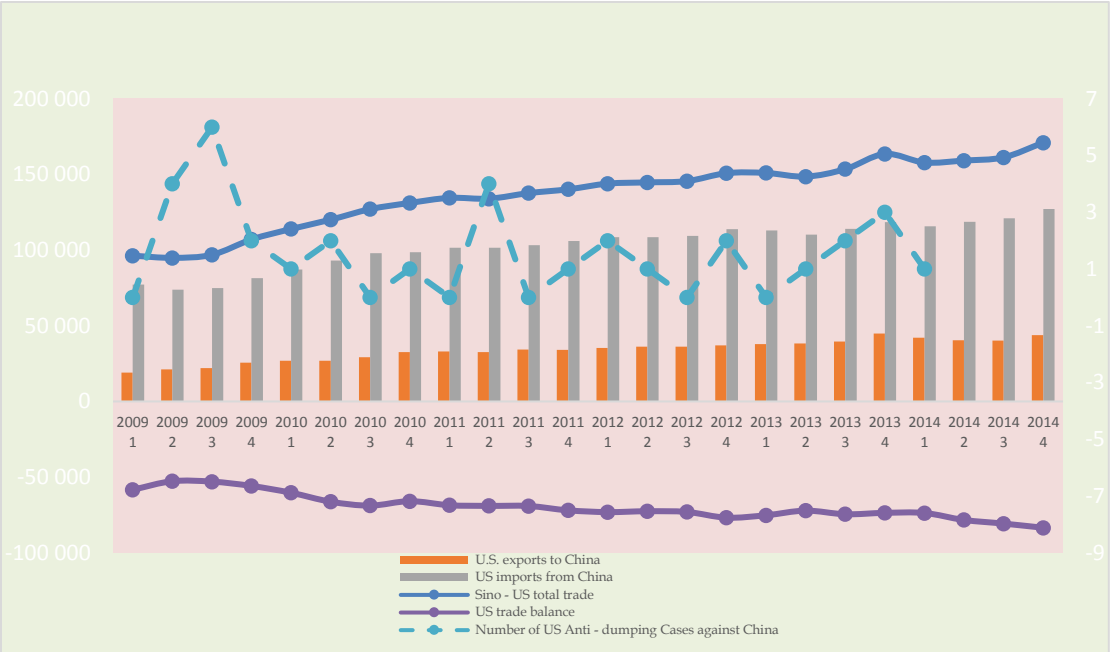
However, due to the financial crisis in 2008, the unemployment of the United States increased rapidly, and coupled with its decades of trade deficit with China. To transfer the increasingly serious national conflicts and correspond to its re-industrial policy, Obama had created more trade frictions with China and made prominent policies. First of all, Obama used administrative and judicial means to strengthen the supervision and investigation on infringement of intellectual property rights against China, urging the establishment and improvement of the relevant protection mechanism. Second, the United States demanded for a more relaxed Chinese market, especially a more liberalized capital market to help their enterprises to settle in a broad area in China such as manufacturing, services and so on as soon as possible, and expand employment and reduce the Sino-US trade deficit. Moreover, call for China's financial system reform; promote the mercerization of exchange and interest rate to create a fair international market order. In addition, the United States launched a more frequent anti-dumping and anti-subsidy investigations against China, mainly concentrated in manufacturing where holds a huge employment, such as tires, steel, etc., and tried to set up new trade barriers to limit the export of Chinese products, for example, the carbon tariff on hand. According to Figure, we can see some relevant data.

The increasingly deepened Sino-US relation makes China have chance to fully exert its comparative advantage. The US trade deficit against China continues to expand, and it has

reached $ 83.4 billion in the fourth quarter of 2014. Frequent anti-dumping lawsuit against China follows. From the figure a basic law can be found. The US trade deficit will be reduced accordingly when the anti-dumping cases are more than the average, in another words, anti-dumping investigations have a restrain effect on trade.

Figure 4: China's Merchandise Trade with the United States and U.S Merchandise Trade with China, 2009-2014

Measurement unit: millions of dollars



Source: Figure is drawn basing on data from the US Department of Commerce.

2.5.5 Sino-US trade relations under President Trump

Table 4: Exports and imports of goods and services from the U.S. to China, bilateral trade surplus or deficit

Million dollars

Year	The U.S. exports to China	The U.S. imports from China	The U.S. trade deficit
2015	164894	498189	333294
2016	170485	478574	308089

2017	187522	522889	335367

Source: Liu Zunyi, 2019, P52 [26]

On March 31, 2017, Trump signed two executive orders focusing on the U.S. trade deficit. [18]

On March 1, 2018, President Trump announced to levy 25% [19] ad valorem tariff on imported steel products and 10% [19] ad valorem tariff on imported aluminum products. Although China is not the major direct exporter of steel and aluminum products to the U.S., it still filed an appeal against the tariff to the world trade organization. The first round of the U.S. tariff sanction against Chinese goods was implemented on July 6, 2018, with a tax rate of 25% and involving a variety of goods valuing 34 billion dollars, such as aero tires, water heaters, X-ray machine parts and various industrial parts. This tariff measure was soon retaliated by China's tariff on U.S. goods worth of $34 billion [20], and the tax rate was likewise 25%, these goods include electric cars, pork and soybeans. The second round of tariff sanction between the two countries was implemented on August 23, 2018, which was against imported products worth of $16 billion, and the tax rate was still 25%.[21]

Meanwhile, China filed a new appeal against the new tariff measure taken by the U.S. to the world trade organization. The third round of the U.S. tariff sanction occurred on September 24, 2018, which was against $200 billion [22] of goods from China, the initial tax rate was 10% and the tax rate increased to 25% since January 1, 2019. This round of tariff measure will increase the total value of Chinese goods affected by the new U.S. tariff to $250 billion, which is close to half of the annual total value of the U.S. imports from China. The retaliatory measure taken by China was to impose new tariff rate of 5% to 25% on U.S. goods worth of $60 billion [23], which increased the total value of U.S. goods affected by China's new tariff to $110 billion. Moreover, President Trump has threatened to raise tariff on another $267 billion Chinese goods if China retaliates against the new U.S.

tariff, this would make the total value of Chinese goods affected by the new U.S. tariff to $517 billion. [24]

According to the U.S. official statistics, the total value of the U.S. imports from China in 2017 was $505.6 billion. [25] Therefore, if the new round of tariff sanction is actually implemented, all the U.S. imports from China will be affected by the new tariff. The impact of this Sino-US trade war on international trade and investment is not limited to China's economy and the U.S. economy, but concerns the global supply chain emerged and developed over the past decade. The trade war has brought great uncertainty to the consumption and investment decision-making of enterprises and residents all over the world, and may lead to permanent change of Sino-US relations.

2.6 SUMMARY

This chapter analyzes the evolution process of Sino-US trade relations. This process is sorted out and divided into four stages: Sino-US trade review from the Qing Dynasty to the Anti-Japanese War; Sino-US trade review from the Anti-Japanese War to the establishment of new China; Sino-US trade review from the establishment of new China to the establishment of Sino-US diplomatic relations; the development and change of Sino-US trade after the establishment of Sino-US diplomatic relations.

In the early stage of Sino-U.S. trade, although Sino-U.S. trade relations were inevitably affected by politics, Sino-U.S. trade was basically completed on the basis of reciprocity and mutual benefit, which made the direct trade between the U.S. and China, develop very fast in spite of the late start. Although the Sino-U.S. trade fluctuated in this stage, it was still on an up-trend on the whole. The trade volume of U.S. to China also increased by over six times from 1791 to 1841,although the increasing the opium export from the U.S. to China eventually changed China's overall foreign trade from surplus to deficit, China was

still in a surplus status in this stage of Sino-U.S. trade for most years. In the following several stages, the status of Sino-U.S. trade changes with Sino-US relations.

Since Sino-U.S. trade normalized, the trade balance status has experienced two distinct stages. The first stage was from 1979 to 1992, and the trade was in deficit all the time. The second stage was after 1993, the trade had been in a surplus state, and the volume of favorable balance was increasing constantly. China's deficit lasted for 14 years from the establishment of Sino-US diplomatic relations in 1979 to 1992. This is mainly because China implemented the trade policy with import substitution tendency in this stage, and the restriction on import was essentially the inhibition on export; in addition, China had just opened to the outside world, it was not familiar with the international market, and the international competitiveness of Chinese enterprises was also weak, so the deficit had been small. However, the absolute volume of Sino-US trade was relatively small during this period, so the proportion of the unfavorable balance volume in the trade volume was large and reached the maximum of 59% in 1980. With the deepening of China's reform and opening up, especially after the establishment of the goal of building a socialist market economy in 1992, China's regulation on foreign trade management system has gradually relaxed, which stimulated the vitality of foreign trade.

At the same time, the international competitiveness of China's products is increasing day by day. Especially, the competitive edge of labor intensive products makes the value of China's exports to the U.S. increase rapidly. Since 1993, the status of trade balance between China and the U.S. has been reversed. China became an export surplus country, its trade with the U.S. was in surplus and this trend had been continuously strengthening. After 1993, the proportion of China's surplus with the U.S. in China's trade volume had been increasing, especially after China's accession to the WTO in 2001, the proportion exceeded 40%. From 2005 to 2007, the proportion reached up to 50%. Then after 2008, affected by the financial crisis, China's export suffered a heavy strike. Meanwhile, the constantly increasing labor cost caused by the appreciation of RMB and the increase in

salary made China's export of labor-intensive products even worse. The growth rate of China's surplus with the U.S. began to fall. But in 2017, China's trade surplus with the U.S. reached $335.3 billion [26], which caused President Trump to sign two executive orders focusing on the U.S. trade deficit, and directly triggered the Sino-US trade war in 2018.

The imbalance of Sino-US trade is the primary obstacle against the development of Sino-U.S. trade relations, as well as the focus of the conflict of interest between the parties, and it is related to the divergences between China and the U.S. in exchange rate reform, market opening and other aspects. The trade imbalance problem is not only caused by the industrial transfer and economic development mode of the U.S., but also related to China's long-term development strategy of fueling economic growth by investment and export. The key to the normal development of Sino-US trade relations is too well deal with the problem of trade imbalance, and this requires joint and long-term efforts of both parties.

3. THEORETICAL FRAMEWORK

3.1 CHAPTER OVERVIEW

This chapter presents the theoretical framework and methodology of this research. Firstly, the definition of international balance of payment is made according to the Balance of Payments Manual formulated by the IMF, thereby introducing the content of trade balance and trade imbalance. Relevant theories of trade imbalance mainly include mercantilism theory, absolute comparative advantage and relative comparative advantage theory, reciprocal demand theory, factor endowment theory, free trade theory, protective trade theory, elasticity approach, absorption analysis approach, monetary analysis approach, etc. Then previous studies are critically reviewed to capture and analyze different ideas and opinions on the subject. In addition, the paper aims to raise a wide range of opinions in a fair and comprehensive way, so as to summarize the achievements and significance of previous studies and identify the gaps and the ways to bridge them.

The studies conducted by scholars, government agencies and research institutions on Sino-US trade imbalance gradually show that Sino-US trade imbalance is no longer a superficial problem reflected by the trade figures, but a dynamic unbalance problem affected by a variety of factors.

Secondly, this chapter introduces the methodology of this research, which mainly includes six aspects of the research approach, research strategy and research design, data collection and data analysis, research ethics, reliability and validity and the limitations of this research.

3.2 TRADE IMBALABCE CORRELATION THEORIES

3.2.1 Definition of trade imbalance

According to the Balance of Payments Manual formulated by the International Monetary Fund (IMF), balance of payments refers to the international capital revenue and expenditure behavior caused by international capital transfer between countries or regions in the world because of trade, non trade and capital exchanges. The concept of trade balance and imbalance comes from balance of international payment. In the balance of international payments, the balance of payments is divided into two major items of current account and capital and financial account. Current account refers to the international economic transaction that occurs frequently within a certain period of time, including goods, services, income and current transfer. The capital account reflects the flow of credit and debts represented by currency between countries by recording the output and input of capital. The financial account records all the transactions about the changes in the ownership of external assets and liabilities of economic entities and reflects the increase and decrease of investment and debts between residents and non-residents. Trade balance refers to that the total export-import volume of foreign trade in a particular year basically tends to balance. Trade imbalance refers to the inequality between total import and export volumes of a country in a particular year. Making a general survey of the foreign trade situations of governments all over the world, the phenomenon of trade balance is not common. Generally speaking, governments should try to maintain the basic balance between imports and exports in foreign trade with few surpluses, which is conducive to the healthy development of the national economy.

Trade imbalance is divided into trade surplus and trade deficit. Trade surplus refers to that a country's exports exceed imports and reflects the vantage ground of foreign trade in that year. The size of trade surplus to a great extent reflects the situation of a country's foreign

trade activities in a specific year. Under normal conditions, a country should not have a large amount of foreign trade surplus for a long time, because it can easily cause conflict with the trade partners, overly high trade surplus is dangerous, which means that the growth of the domestic economy is overly dependent on the external market, and excessively high foreign-trade dependence makes a country's economy susceptible to other countries. The trade deficit means that a country's total imports are greater than its total exports. It reflects a country's disadvantage in foreign trade. For a country, the government authorities should try to avoid long-term trade deficit, as a large amount of trade deficit can result in the outflow of domestic resources and the increase of external debts, which can exert an adverse impact on the normal operation of economy.

Trade imbalance is dynamic and frequent, while trade balance is a short-term phenomenon and relative. The trade between various countries in the world has always been incompletely balanced. Even if economic globalization exerts some balanced effect on the distribution of trade flow between countries, it is impossible to form a completely balanced trade pattern. [27]

Zheng, Shi and Wang believed that in the long run, as long as a country's foreign trade imbalance can be made up by other items in the international payments account, and it didn’t lead to the deterioration of the international payments, or bring the potential risk of deterioration or hidden danger to the country's economic development and financial security, the imbalance is acceptable, or say, a country’s ability to cope with external negative impacts can sufficiently maintain the surplus or deficit of trade balance in a relatively long period of time. In other words, the key to judging whether trade imbalance is dangerous is not the scale of imbalance, nor the length of the imbalance time, but the concrete analysis of a country's national conditions. Some countries can maintain the status of foreign trade imbalance for a long time and on a large scale, without affecting national economic development and financial security, but for some other countries, short-term and slight trade imbalance are likely to cause financial and economic crisis.[28]

3.2.2 Mercantilism

Mercantilism is a national economic policy aiming to maximizing a country's exports while minimizing its imports. [29] Mercantilism was dominant in modernized parts of Europe from the 16th to the 18th centuries, a period of proto-industrialization, [30] before falling into decline, although some commentators argue that it is still practiced in the economies of industrializing countries, [31] in the form of economic interventionism. [32] It promotes government regulation of a nation's economy for the purpose of augmenting state power at the expense of rival national powers. High tariffs, especially on manufactured goods, were an almost universal feature of mercantilist policy. [33] Mercantilism can be divided into early mercantilism and late mercantilism. The early mercantilism proposed by W Stafford, John Hales, etc. centers on money balance theory, equates wealth with precious metals such as gold and silver, and stresses that the national interests lie in the increase of currency. It strictly prohibits the exports of gold and silver, and pursues the absolute principle of buying less and selling more in foreign trade, namely, to reduce imports and increase exports to reserve gold and silver currency. The late mercantilism was mainly proposed by Thomas Mun et al., who argued that the economic activities between countries dominated by the static view of world resources can be regarded as a kind of "zero-sum game", that is, one country's economic income is at the cost of another country's economic loss. Precisely supported by this view, late mercantilism explicitly advocates to taking "trade balance theory" as the core. In terms of policy suggestions, they proposed that countries should protect and reward exports and production, and take protectionist measures to restrict domestic imports, especially for those industries of strategic significance. Thomas Mun held that currency produces trade and trade increases currency. In his classic work of mercantilism, England's Treasure by Foreign Trade, he wrote that the means to increase England's treasure is to develop foreign trade, but a principle must be observed, that is, the total value of commodities sold to foreigners should be greater than that of commodities purchased from them; he stressed that a country should maintain its trade surplus, in order to achieve this purpose, a country should never

hesitate to implement trade protectionism policies, such as giving subsidies to exports, implementing quotas and high tariffs on imports of consumer goods, etc. These policies can encourage exports of domestic commodities and restrict imports of foreign commodities. There into, he advocated increasing the exports of agricultural products and industrial manufactured goods, reduce the imports of foreign manufactured goods, and oppose British residents to consume imported products that can be produced in Britain. The late mercantilism theory shows that, as early as the 14th to15th Century, the theoretical research on the balance of trade attracted the attention of economists, but the theories in this period mainly focused on the importance and influence of the balance of trade.

Lin (2006) [34] believed that China's foreign trade policy has a mercantilist tendency, which has led to the low efficiency of foreign trade and the "immiserizing growth" of the macro economy. Zhai (2007), Hu (2009) [35], Huang (2009), Xiao (2009)[36] and Cheng (2009)[37] agreed that since the reform and opening up in the 1970s, the "import substitution" and "export-oriented" implemented by China at the very start is one of the significant causes for the huge trade surplus in distinct "export-oriented" economic development strategy after the reform in 1994. But Li (2006)[38] etc. analyzed China's import and export data from 1980 to 2004, and concluded that if China did implemented mercantilism, it should have large-scale trade surplus against every trading partner country, but the surplus only came from a few big European and American countries. China’s trade deficit against South Korea and Japan has been continuously expanding respectively since 1991 and 2002, which can hardly support the mercantilism of China's trade policy and system.

In December 1791, Alexander Hamilton, the first American finance minister, a representative of the requirement of independent development of the American economy, proposed the tariff thought of protectionism for the first time in the Report on Manufacturing Industry submitted to the United States Congress. He believed that the infant industries in the United States should be protected in order to make the American

economy independent. Later, Friedrich List, a scholar of German historical school, elaborated the famous trade theory of protecting infant industries in the book The National System of Political Economics, which was published in 1841, and stressed that "some industrial products can be prohibited from being imported, or the stipulated tax rate is actually equal to all or at least part of the banned imports". Since then, the protectionist trade theory has been developing rapidly.

3.2.3 Theory of absolute cost advantage

Mercantilism regards currency as wealth and foreign trade as a kind of none mutually beneficial zero-sum game. This view was criticized by David Hume, a British ideologist. The most powerful weapon used by Hume to criticize mercantilism was his quantity theory of money, in which he mentioned that there is an automatic mechanism for a country's currency and total volume of commodities to achieve a balance, so it is not only stupid but also doomed to failure unilaterally pursuing trade surplus in international trade. Following Hume, Adam Smith modified the mercantilism theory. The concept of absolute advantage is generally attributed to Adam Smith for his 1776 publication The Wealth of Nations in which he countered mercantilist ideas. [39] Adam Smith first described the principle of absolute advantage in the context of international trade, using labor as the only input. Since absolute advantage is determined by a simple comparison of labor productiveness, it is possible for a party to have no absolute advantage in anything. [40] Smith also stated that the wealth of nations depends upon the goods and services available to their citizens, rather than their gold reserves. [41] Adam Smith created the theory of international division of labor and international trade. In his representative work, The Wealth of Nations, Adam Smith put forward the theories of international division of labor and free trade. In terms of the theory of international division of labor, Adam first analyzed the benefits of division of labor. He believed that division of labor is applicable to not only different occupations and categories within a country, but also different countries. Smith's theory of absolute cost advantage proposes that every country has its absolutely favorable production conditions

suitable for the production of specific products, so that specialized production and exchange can be carried out, which is beneficial to all the countries engaged in the exchange. This is the theory of absolute advantage. [42] The theory of absolute cost starts from the principle of labor division to demonstrate the mutual advantages of trade for the first time in the history of economic development, and meanwhile criticizes the mercantilists' one-sided view that international trade is only beneficial to countries with trade surplus. The influence of this win-win thought of trade division and mutual benefit has been existing up to now and constantly verified by applied economics. In some sense, this win-win thought is the guiding thought for contemporary countries to open wider to the outside world and actively participate in international division of labor and trade.

3.2.4 Theory of comparative advantage

David Ricardo broke through the limitations of Adam's theory of absolute advantage and proposed his theory of relative comparative advantage. He established a simplified classic model to explain the theory: even if a country has no absolute advantage in production, it can still obtain benefits through comparative advantage in international trade. This classical model contains the following hypotheses: one factor, two kinds of commodities, and constant returns to scale, constant labor productivity and different relative labor productivity of two countries. With this model, under the system condition of price guiding resource allocation, free trade is implemented, and the cost ratio of different domestic products is compared with that of similar products in foreign countries, as long as there is a difference in the cost ratio, different countries will be able to and inevitably exchange with each other and obtain economic benefits. According to Ricardo's theory of comparative advantage, comparative advantage stems from the differences in labor productivity and the resultant labor cost between countries, but the cause of the differences haven't been explained.[43]

3.2.5 Theory of factor endowment

In 1919, Heckscher, a Swedish economist, discussed the important role of factor endowment difference in determining a country's comparative advantage and in international trade in his book titled The Impact of Foreign Trade on Income Distribution. Ohlin, a student of Heckscher, inherited and developed Herschel's thought of factor endowment in his 1933 work Regional Trade and International Trade, and established the theory of factor endowment, which is also known as H-O theorem, namely, the 2x2x2 model.

The model starts from the idea of general equilibrium and focuses on the root of comparative advantage. Based on the hypotheses including identical commodity production functions and consumers' consumption preferences in different countries, constant returns on scale, complete competition between commodity market and factor market in different countries, completely free flow of products across borders and completely immobile factors, the following conclusions are obtained: first, production activities need not merely a factor of labor, but multiple equally important factors such as capital and land; second, the reason for different product costs in different countries is different combinations of production factors, as well as the differences in relative price ratio between the input production factors, that is, the differences in production factor endowment between countries; third, every country uses the products with the most abundant domestic production factors in its division of labor, and all the countries get the maximum benefits through international trade. Ohlin and Heckscher believed that the different factor endowment of different countries is the fundamental cause of international trade. A country should export products that intensively use the relatively abundant domestic factors and import those that intensively use factors it is relatively short of. [44]

In 1941, American economists Stolper and Samuelson introduced Stolper-Samuelson

theorem, which is called SS theorem for short. Stolper and Samuelson held that factor price will increase with the increase in the price of products which intensively use the factor, and vice versa. Furthermore, SS theorem predicts FPE factor price equalization (FPE): in the case of immobilized international capital and labor, the price of factors will be entirely equivalent among countries because of free trade. [45]

In 1977, following the research conducted by Haberler (1937) and Tower (1947), Dixit and Stiglitz introduced scale economy to analyze comparative advantage, namely, the DS model. They argued that even if the initial conditions of two countries are identical, if the exogenous comparative advantage proposed by Ricardo did not exist and there is scale economy, the two countries can choose different divisions of labor based on specialization, so as to generate endogenous absolute advantage. [46] In economics, Helpman and Krugman were the first to introduce scale economy into comparative advantage analysis. They believed that returns to scale and market size endogenously determine the diversity of product number. [47]

In 1993, Dollar et al. introduced technological differences into comparative advantage analysis. They held that technological differences can more reasonably explain the continuous deepening of specialization degree in developed countries.[48]Later, Davis (1995) pointed out that even under the market conditions of constant returns to scale and perfect competition, technological differences can cause trade between products of the same industry in two countries. Most of the above researches are aimed at the differences in comparative advantages between developed countries caused by technological differences. [49]

In 1990, Grossman and Helpman introduced knowledge capital into comparative advantage analysis to explain the difference in comparative advantage between two countries from the perspective of research and development. Based on a dynamic general equilibrium model of product innovation and international trade, they analyzed the

comparative advantages produced by research and development and the intertemporal evolution of world trade. In this model based on knowledge capital and differentiated products, it is assumed that knowledge can flow freely internationally, and enterprises will have cost when introducing new products, so forward-looking producers will research and develop products with profitable opportunities, the development capabilities of new products owned by enterprises in various countries determine the comparative advantages and trade pattern of the countries, and indirectly affect international trade pattern. Intra-industry trade is mainly determined by research and development, while inter-industry trade is determined by resource endowment. [50]

When a number of scholars focus the research of comparative advantage on the factors of supply, Linder developed the theorem of comparative advantage from the factors affecting demand. In 1961, Linder proposed the similar demand hypothesis, who believed that domestic demand determines the range of potential imports and exports. When a country's product output exceeds the domestic demand, export capacity is generated; otherwise, import capacity is generated. Even if there is no difference in factor endowment and productions function between different countries or regions, as long as two countries have similar demand structures, there will be potential trade access between the two countries because of the difference in demand preferences. Meanwhile, he held that income level can affect the demand structure of a country. The closer the per capita income between countries, the more approximate the demand structure, the greater the potential trade possibility and the larger the actual trade volume. The theory also indicates that the more similar the income level, the more the intra-industry trades. [51]

3.2.6 Free trade theory and protective trade theory

Under the guidance of free trade theory, the primary objective of foreign trade is to replace trade surplus with comparative advantage obtained from international trade. In order to

meet the needs of constantly expanding foreign trade, the gold standard system emerged. For the trade balance and adjustment of international payments under the gold standard system, David Hume introduced the "price-coin flow mechanism". It refers to that under the gold standard system; a country's deficit in the international payments means the net output of the domestic gold. Due to gold outflow, the domestic gold stock decreases, and the money supply would decrease, thereby causing a fall in the domestic price level. After the price level falls, the competitive capacity of domestic commodities in the foreign market would be enhanced, and the competitive capacity of foreign competitive capacity in domestic market would decline, then exports would increase and imports decrease, and the deficit in the international payments would be reduced or eliminated. Similarly, the external surplus cannot be sustained, because the internal flow of gold would increase the domestic money supply, thereby resulting in the rise of price level, which is not conducive to exports but beneficial to imports, thus the surplus would tend to disappear. According to this mechanism, the price change caused by gold would exert a regulating effect, so as to automatically improve trade balance. [52]

In the 1930s, J.M. Keynes pointed out in his representative work The General Theory of Employment, Interest and Currency (1936) [53] that, although the classical free trade theory has demonstrated that a country's foreign trade surplus and deficit tend to be balanced through automatic adjustment with the theory of automatic adjustment of international payments, these theories ignored that the adjustment of trade balance would affect a country's national income and employment. Therefore, Keynes held that the impact of trade balance on national income and employment should be carefully analyzed. Through research, he found that trade surplus can increase national income and expand employment, while trade deficit can reduce national income and aggravate unemployment. Therefore, he highly praised the mercantilist idea of state intervention, advocated to strengthen the state's intervention effect in foreign trade, favored trade surplus and opposed trade deficit. In the book, Keynes also proposed the famous multiplier theory, and thereafter he constantly improved it into a new set of trade protection theory. The theory

holds that, under the role of trade multiplier, national income can increase exponentially at a certain rate with the progressive increase of exports. That is to say, the more a country expands its exports and reduces its imports, the greater the trade surplus, and the greater the role on the domestic economic development. Therefore, the countermeasure for a country to increase effective domestic demand is to restrict imports and reward exports, that is, create full employment and increase effective demand. The optimal policy for a country is to implement trade protectionism, maximize exports and reduce imports as far as possible.

Later, the followers of Keynesianism continued to improve the Keynesian trade protectionism theory. The scholars represented by Wynne Godley put forward the new protectionism trade theory. Through the analysis and expansion of the protectionist trade theoretical model, the theory verified the important role of the international payments on a country's national income, and proposed that maintaining foreign trade surplus has the direct bearing on the improvement of a country's national income and the realization of full employment. Hence, it is necessary for a country to restrict imports and reward exports to speed up the growth of its national income. A series of Keynesian trade protection theories have provided sufficient theoretical basis for western developed capitalist countries to implement super-protection trade policy and pursue surplus income of foreign trade after World War II. Then various countries in succession implemented the trade theories to pursue trade surplus and expand their trade surplus. Meanwhile, Keynes and his followers further demonstrated the importance of trade surplus to a country's economic development. From this point of view, the Keynesian trade protection theory is of great practical significance for the economic development of capitalist countries. However, the theory did not investigate the possible impacts of trade surplus on the world economy, and especially lack an overall analysis of the positive and negative impacts of trade surplus on a country's economy.

3.2.7 Reciprocal demand theory

In 1848, the British economist Mueller published the book named The Principle of Political Economy and Its Application in Social Philosophy. In the book, he proposed the theory of reciprocal demand and made an important supplement and explanation to the theory of comparative cost. Mueller believed that the term of trade and its changes are mainly determined by the intensity of reciprocal demand of two countries for commodities from the trade partner. Within the upper and lower limits of the proportion of international commodity exchange, the stronger the demand of one country for the export commodities from its trade partner, and the weaker the demand of its trade partner for its export commodities, then the more unfavorable the terms of trade are to the country, the less benefits the country can obtain from foreign trade, and vise versa. The closer the international exchange rate is to the domestic exchange rate, the more unfavorable it is to a country, the less trade benefits the country can obtain, and vise versa. Marshall, a British economist, developed the theory of reciprocal demand proposed by Mueller. He used the reciprocal demand and supply curve to explain how commodity supply and demand co-determine the terms of trade and its changes, that is, to further investigate demand and supply and combine them together. Marshall's analysis of the terms of trade and trade benefits is based on the full exertion of the role of market mechanism. Therefore, Marshall also advocated free trade. In the theories proposed by Ricardo and Marshall, it is assumed that there are differences in the production of specific products between countries. Different countries are adept at producing different products, because they have different resource endowments.

3.2.8 Elasticity approach

The elasticity approach to adjust the international payments refers to the adjustment of current account imbalance by changing exchange rate and price under the condition of

constant income. Because this regulatory mechanism is closely related to the elasticity relation between supply and demand of import and export commodities, it is called elasticity theory. This theory was first proposed by Marshall, a British economist, and later developed into one of the important component of the international payments theory through the joint efforts made by Robinson, Meckler and Harper. Currency devaluation exerts price effect and trade volume effect on current account balance. The combination of these two effects can change the balance on current account. Under a series of assumed conditions, British economists Marshall and Lerner concluded that when the sum of import and export demand elasticity is greater than 1, the currency depreciation of a country can improve its trade balance. The elasticity approach has been widely applied in the analysis of the impact of exchange rate movement on the international payments. Since the Marshall-Lerner condition has become the premise for currency devaluation to improve trade balance, the demand elasticity of import and export commodities of a country becomes the most important theoretical standard for judging whether depreciation is beneficial or harmful.

Some econometricians made a statistical analysis on the price elasticity of international trade commodities as early as the 1930s. The analysis results showed that the demand elasticity of import and export commodities was quite low and insufficient to make depreciation play its due role. Therefore, the theory of elastic pessimism prevailed for a time until the depreciation of pound in 1949, which achieved unexpected effects. In the 1950s and 1960s, the theory of elastic optimism gained the upper hand. It was found that with the increasing proportion of industrial manufactured products with higher elasticity and decreasing proportion of primary products with lower elasticity in international trade, the sum of demand elasticity of import and export commodities can reach 1 in most cases, so the Marshall-Lerner condition can be met. [54]

The elasticity approach assumes that the depreciation of domestic currency only changes the relative price of both sides of the trade, rather than the domestic prices, but this

assumption is apparently unreasonable. The actual situation is that the depreciation of domestic currency will inevitably lead to the rise in domestic prices, thereby increasing the domestic production costs, while the effective exchange rate and export competitiveness will decline, as a result, the international payments cannot be improved as desired. Given this, people have always been doubtful about elasticity theory.

3.2.9 Absorption analysis approach

The absorption analysis theory of international payments adjustment was put forward by Sydney Alexander when he served in IMF in 1952. Based on Keynesian expenditure analysis method, this theory starts from Keynesian national income equilibrium formula (Y=C+I+G+X-M) to investigate the adjustment process of international payments imbalance. The theory holds that only when the increase of a country's income from commodities and labor services (general income Y) exceeds its domestic absorption capacity (C+I+G), where C represents consumption, I represents investment, and G represents government expenditures, will the country's international payments be improved. Therefore, a country's international payments imbalance needs to be adjusted by changing its national income or domestic absorption. The concrete method is as follows: when there is a deficit in the international payments, it is necessary to increase national income or reduce domestic absorption to balance the payments, while in the case of a surplus, it is necessary to reduce national income or increase domestic absorption to achieve balance. Hence, this theory is called by the academic circles an organic synthesis of Keynes' multiplier theory and the elastic analysis theory of international payments adjustment.

3.2.10 Monetary analysis approach

Both elasticity approach and absorption approach stress the adjustment of trade balance, but they ignore capital and financial items. With the development of international economy,

the importance of capital flow or financial assets trade is becoming increasingly significant in international payments, and even exceeds that of current account. It is precisely in this context that the monetary approach of international payments has become the mainstream among the theories of international payments since the 1970s. Monetary approach adopts the simplest mathematical model to express its center theory, i.e., H=R+D, where H represents money supply, R represents international reserves, and D represents domestic financial assets held by monetary authorities, i.e., domestic credits. It can be seen from the above formula that, the money supply of a country is divided into two parts, those are, the domestic creation part D and foreign part R. The change in domestic money supply can be caused by the change in domestic credits or international reserve assets. Suppose that money supply H is equal to money demand I in a long period of time, by changing the above formula a little, the following formula is obtained: balance of international payments =Money supply-Domestic credits= Money demand- Domestic credits.

Thus it can be seen that, the international payments are related to the supply and demand of currency. When a deficit occurs in international payments, there will be an increase in domestic credits or a decrease in monetary aggregates. In the short run, the difference between money supply and demand is reflected in the change of reserved items of international payments. Under fixed exchange rate system, balanced international payments means that the reserved items remain unchanged. Under the freely floating exchange rate system, with corresponding changes in money supply and demand, the international payments can achieve balance automatically.

The monetary approach holds that international payments are essentially a monetary phenomenon, so the imbalance of international payments can only be corrected by monetary policy. Various adjustment methods, such as depreciation, tariff, import quotas, foreign exchange control and absorption policy of reducing expenditure, can only correct the deficit in international payments when they reduce money supply relative to money demand or increase money demand relative to money supply. For example, depreciation

can only temporarily improve the balance of international payments by changing the domestic price level and increasing the actual domestic money demand or reducing the domestic money supply. Therefore, controlling the growth rate of domestic currency is the most effective way to ensure the balance of international payments. The money approach not only analyzes the reserve items that fully reflect the international payments, but also contributes to the analysis of current account items and capital account items. Compared with absorption approach, money approach not only extends the research scope from current account to the entire international payments, but also demonstrates the inner link between a country's domestic money supply and demand status and international payments, which is its major contribution. But the method has some defects, for example, it focuses on long-run analysis, but in fact, the money demand is unstable in the short term, in addition, it neglects the role of important non-monetary assets factors.

3.3 LITERATURE REVIEW

3.3.1 General study of Sino-US trade imbalance

Clyde (1996) pointed out that China's exports to the United States are mostly for industries which no longer produce products the United States. The Chinese export of labor-intensive products to the United States will not affect the industrial production and employment in the United States or the share of American products in the international market, but acts as a beneficial complement to the American economic structure and makes for the adjustment of the economic structure. The white paper issued by China State Council (1997) pointed out that the product structure of Sino-US trade is complementary and mutually beneficial. The statistics of the place of origin can hardly truly reflect the trade balance between China and the United States, in particular, large error exists in the statistics of entrepot trade and processing trade. This is the essence of the exaggerated US-China trade deficit. Lardy (1998) believed that the US-China trade deficit is structural and reflects the change of the

overall situation of emerging industrial countries in Asia. The increase in China's share of world exports in clothing, toys, sports goods and footwear is merely filling up the blank left by the economic upgrade in the Asian emerging market.

Feienstra, Hai, and Yao (1998) pointed out that the constantly expanding US-China trade deficit in recent years reflects the different macroeconomic policies and structural conditions of the two countries. The reasons include that the macro-economic forces in the United States and China move in the opposite direction, resulting in an upset in the closely related overall trade balance; the transfer from East Asia to China of the production of most imports to the United States has been sped up. Fung and Lau (1998) argued that, there is a huge difference in the estimation of bilateral trade balance between China and the United States, which is mainly caused by their different treatments of entrepot trade, entrepot gross margin and service trade in Hong Kong. On the one hand, there is a transfer of trade deficit among China, Hong Kong and Taiwan; on the other hand, the direct investment of Taiwan and Hong Kong in Chinese mainland is partly responsible for the growth of US-China trade deficit.

Zhang (1999) argued that the United States holds that the US-China trade deficit is caused by China's lack of market intervention, policy transparency and violation of human rights, while China believes that the trade deficit is not as serious as described by the United States and mainly attributed to the differences in statistical methods, besides, with regard to the rules of origin, the United States cannot reflect the trade imbalance status between the two countries. Yao (2000) held that ignoring the role of Hong Kong in Sino-US trade would exaggerate the deficit damage the United States suffered in the trade. Davis and Weinstein (2002) proposed that the US-China trade deficit is a long-term policy issue, and the US-China trade imbalance can be put down to the overall macroeconomic imbalance or triangular trade. There into, the US current account deficit is closely related to the macroeconomic imbalance of investment excessively exceeding savings.

Li (2003) pointed out that the Sino-US trade surplus is a structural contradiction and can hardly be resolved through the bilateral mechanism of WTO. Therefore, the resolution of bilateral trade disputes needs bilateral compromise, and the conflicts caused by Sino-US trade should be handled with a positive attitude. The National Council for U.S.-China Trade (2004) pointed out that the scale of US-China trade deficit is often overestimated and the US exports to China are always underestimated. In fact, taking service trade into account, the US-China trade deficit would be further reduced after China's accession to the WTO. Only 10% of the US imports from China directly compete with the products produced in the US. Hence, even if the United States cuts down its imports from China, its trade deficit would not be reduced. [55]

Niu (2004) pointed out that the dominant historical view and international relations view of great powers in the American society hold that China will inevitably become a superpower, so China's economic development must be contained. In this context, to reduce the US-China trade deficit and lower the high unemployment rate, the United States has forced the RMB to appreciate by politicizing and internationalizing the issue of RMB exchange rate, and through political means such as pressuring China in diplomacy and international multilateral conferences. At the same time, it takes economic means including anti-dumping, evaluating the performance situation of China's accession to the WTO, and applying Clause 301 to suppress China.

Huang (2006) argued that about 1/3 of the foreign exchange reserves brought by Sino-US trade surplus were used to purchase the US Treasuries, and a large amount of the benefits from China's trade surplus with the United States flow back to the United States, which is conducive to long-term interest rate stability of the United States, and then to the development of the realty business, the expansion of resident consumption demand and economic growth in the United States. Yang (2006) [56] believed that although the Sino-US trade is unbalanced, the economic benefits are shared. The increase of China's surplus with the United States has aggravated the cycle of "the poor helping the rich". Du

and Peng (2007) believed that the Sino-US trade balance will tend to decline in the medium and long term, which is on the one hand a response to the political pressure in the United States, and on the other hand an inevitable requirement of China's internal economic adjustment. China needs to strive for more extensive and longer-term interests in the adjustment of internal and external balance. [57]

3.3.2 Trade statistical discrepancies and the problem of Sino-US trade imbalance

3.3.2.1 Different statistical calibers enlarging the amount of Sino-US trade imbalance

Unlike the export pricing method adopted by most countries, the American statistics on the export data is conducted according to free alongside (FAS), while China's export data is calculated based on FOB. The statistics on both the American and Chinese import data are based on CIF (Fung and Lau, 1998, 2001, 2003, 2006) [58][59][60][61]. As the pricing basis for imports and exports is different for the two countries, it is necessary to convert the imports and exports of both countries into a unified FOB to compare the differences in the statistical data of bilateral trade, and then calculate the degree of trade imbalance between the two countries.

According to the internationally universal conversion method, it is necessary to add 1% cost to the American FAS export value and convert it into FOB (Huang and Broadbent, 1989) [62]. The research conducted by Shen (2005)[63] showed that the difference in import and export pricing between China and the United States and transportation delay have led to the difference of bilateral trade statistical data, which is one of the important causes of the dispute in amount of Sino-US trade balance. Yuan(2005)[64] argued that, in terms of the statistical scope, the United States adopts the general trade system, takes the national territory as the statistical boundary, and includes the goods stored in the American

free trade zones and bonded warehouses, while China adopts the special trade system, takes customs territory as the statistical boundary, and excludes the goods stored in the bonded warehouses, as a result, the statistical scope of the United States is slightly larger than that of China, which can aggravate the US deficit.

3.3.2.2Entrepot trade and entrepot added value aggravating the unbalance of Sino-US trade

Hong Kong's entrepot trade and the added value of the entrepot trade is one of the important causes of the difference in the amount of official trade imbalance between China and the United States. Because of the unique advantages in transportation and insurance, Hong Kong plays a special role in China's foreign trade. The white paper issued by China State Council (1997) pointed out that the statistics done according to the rules of origin can hardly truly reflect the Sino-US trade situation, in particular, large error often exists in the statistics on entrepot trade and processing trade, which is the essence of the seriously exaggerated US-China trade deficit and the distorted situation of Sino-US trade imbalance.

Xue, Jia, Zhao, et al. (1998) [65] and Fung and Lau (1998, 2001, 2003, and 2006) [66] [67] [68] held that the American statistics overestimated the imports from China and underestimated the exports to China. In terms of exports, the United States counts the goods transited to China via Hong Kong as exports to Hong Kong; in terms of imports, it counts Chinese goods transited via Hong Kong as imports from China. For China, in terms of exports, since the destination of goods transited to Hong Kong cannot be determined, it is impossible to count all the products that arrive the United States through Hong Kong as exports to the United States, resulting in an underestimation of China's exports to the United States. Huang and Broadbent (1998)[69] believed that there are relatively large differences between China and the United States in compiling bilateral data, including the differences in pricing basis and transportation delay, especially China’s entrepot trade via Hong Kong and the practical difficulties for correctly pricing these trade flows.

Shen (2005) [70]concluded by calculation that, from the perspective of entrepot trade via Hong Kong and referring to the estimated values of Sino-US trade, the US statistics overestimates the imports from China and underestimates the exports to China, resulting in the overestimation of US-China trade deficit, while China's statistics underestimates the exports to the United States and properly estimates the imports from the United States, leading to an underestimation of the Sino-US trade surplus. Referring to the new estimated value of Sino-US trade after the removal of Hong Kong's entrepot gross margin, China still underestimated its exports to the United States. Specifically speaking, from 1995 to 2003, the annual average US exports to China was underestimated by above 24% [71] in the American statistics, and the average annual imports from China was overestimated by above 35% [72].As to China's statistics, the annual average exports to the United States was underestimated by over 20% [73], and the statistical value of imports from the United States remained unchanged. Accordingly, the annual average US-China trade deficit was overestimated by over 65% [74] from 1995 to 2003 in the American statistics, while the average annual trade surplus with the United Sates was underestimated by over 33% [75] in China’s statistics.

3.3.2.3 Service trade

Some scholars attributed the statistical difference in Sino-US trade to the fact that the amount of service trade was not included when calculating trade balance between the two countries, thereby exaggerating the trade imbalance between the two countries (Fung and Lau, 1998, 2003). [76][77] The estimated results obtained by Shen (2005) [78] showed that the Sino-US service trade developed rapidly from 1995 to 2002. It increases from 2.5[79] billion dollars in 1995 to 6.1 [80] billion dollars in 2002. According to Xie (2000), the primary cause of trade deficit of the US is the trade structure and economic structure itself, or one of the primary causes is the huge service trade surplus, which reflects that the US has comparative advantage in global economic relations that conform to the general pattern

of trade structure of developed countries. The essence of the Sino-US trade imbalance is the increasing servitization and informatization of the US economic structure, it is the result that industrial structure constantly transfer to capital, technology and information intensive industries, meanwhile, it is the result of economic development based on opening-door policy and labor intensive industrial structure. Therefore, this trade imbalance that reflects the Sino-US economic structure complementarity will not damage to the long-term Sino-US interest, on the contrary, it makes for the current economic structure adjustment of the US and the development of Chinese market economy to some extent. Yin (2001) [81] further indicates that there will be huge error and omission for the service trade is hard to count. For example, because of the difficulties in statistics, finance, insurance, consulting and engineering technical service, which are important in service trade and the US has fairly advantages, are not calculated respectively as independent main classes. So he believes that the surplus of the US service trade was underestimated.

3.3.3 Rule of origin and the Sino-US trade imbalance

The current pattern of the system of national accounts originates from 1940s. In that situation, the trade of FDI and intermediate products was not important. Cross-border trade is the main way to transport goods and services to other countries. The amount of international investment is small and the commodity exchange relationship between countries is relatively simple. Statistics of original country can reflect the division of labor, trade relations and the corresponding pattern of interests among countries.

However, due to the rapid development of economic and trade relations among countries in the world and the increasing cross-border investment, international trade is no longer exchanged for products produced in a single country, but for "world products" produced across national boundaries. It is obvious that the current method of counting import and export trade in terms of origin cannot accurately reflect this major trend in world economic

development and even distort the trade balance between countries. The United Nations conference on trade and development (1994) indicated that balance of payments accounts were designed to record transactions between residents of different countries, traditionally; these accounts recorded the sales and purchases of all foreign branches of their countries. However, with the trend of integration in the world economy, the balance on the existing accounting structure does not fully reflect the activities of the multinational companies, goods and services in international market were transferred through the local-established foreign branches, rather than the trading of resident units and very live unit with the traditional meaning.

The definition of rules of origin for entrepot trade is not very clear. Countries take whether the goods were processed substantially as the main evidence to judge the country of origin, but there is no detailed statistics enforcement regulation to predicate “whether the goods changed substantially”, countries always combine their actual situation, but the standard and severity are different, it is optional when judge the country of origin, the standard needs to be completed. The third country or region that is engaged in transit trade just earns a certain profit between producing country and consuming country through the method of selling at a low price and buying at a high price. It does not process the commodities, that is, it does not substantially change the characteristics of the commodities. So the relevant provisions of the product origin is still a producer country, the entrepot trade part was calculated to the producer country's export. The difficulty in knowing the country of origin and the final destination of export after the products have been re-exported through multiple countries is an important factor that leads to the error of trade data. In addition, there is no clear and unified amendment method for the value-added part of transit trade, mainly based on the declaration of importers, resulting in inaccurate statistical data. Just as the standpoint of Xue and Jia (1998) [82], due to the inherent difficulties in the three criteria of rules of origin, rules of origin distort the real situation of China's foreign trade development. The three criteria lead to the false increase of mechanical and electrical products and textiles in China's import and export categories. International trade statistics

should not only be conducive to international trade comparison, but also truthfully record and reflect the trade status of a country, reflecting the trade relationship between countries. However, the globalization of production makes it more and more difficult to determine the actual origin of products of multiple countries, especially the development of processing trade, which adds the complexity to this issue. Processing trade refers to a trade mode in which a country imports major raw materials and spare parts from abroad and re-exports them after processing and assembling. Because the goods changed substantially in the country, so statistics to the country of origin, the country was classified as the country of origin. But because the country imports most of its raw materials and components, the real gains are often modest.

Moreover, in the case of the massive increase in intra-transnational trade, the origin statistics greatly mask the true trade between countries. As foreign direct investment makes international business activities more and more borderless, the internal trade of transnational corporations is manifested as trade between countries. The current system of trade statistics does not reflect the impact of these changes in the collection of relevant trade statistics. Because under the "cross-border principle", the data and collection methods of "customs clearance registration" can not only collect the local sales data of foreign affiliates in the host country, but also record the intra-company transactions of "cross-border" sales of foreign affiliates back to their home countries as exports of the host country where the transnational corporation invests (Li 2006) [83]. The direct investment of the parent company in the host country replaces the direct export of the parent company's commodities to the host country to some extent, thus entering the domestic market of the host country in disguise. Therefore, the investment of the parent company in the host country and the sales revenue of commodities and services belong to the home country, but are included in the account of the host country in the trade statistics (Wan 2007). [84] As a result, he indicates that under the current system of trade statistics, China's exports are inflated and the US exports are reduced by the economic activities of overseas affiliates, thus distorting the true balance of trade between China and the US.

3.3.4 The US export control to China and the Sino-US trade imbalance

According to James Harding (1997), [85] it is hard to say which side will account for the trade deficit between China and the United States if the United States lifts export control on China? It is true that the United States has obvious export control on high-tech products trade with China, which directly impedes the export of high-tech products to China and aggravates the trade imbalance between China and the United States. So the us trade deficit with China is the inevitable result of discriminatory US export control policies towards China; there are several scholars support this opinion: Lin (2007) [86]indicates that Under the pretext of national security, some developed countries have imposed various restrictions on the export of high-tech products and capital-intensive products to China, which have greatly limited the scale of China's imports and thus expanded China's trade surplus; Zhou(2006) [87]believes that China's trade surplus with the US is actually the result of the actions of the US. Easing the embargo on high-tech exports to China is the only way to ease the US trade deficit with China.

3.3.5 RMB exchange rate and Sino-U.S. trade imbalance

In special column of New York Times, Krugman requires the Treasury Department of United States define China as “Currency Manipulator”, he believes that the US has lost 1.4m to 1.5m jobs because of the undervalued RMB, he even believes that if China deregulated its currency, global growth would be 1.5 percentage points higher. His opinion was approved by many people in the US political circles. Some overseas scholars, represented by Goldstein and Lardy (2004), believe that the artificially low level of the RMB makes Chinese goods exports more competitive and that is the main reason for China's foreign trade surplus; Goldstein (2005) believes that RMB was undervalued by 15%-25% [88]. while some mainstream media outlets in the United States or American

companies doing business with China are not impressed, in response to krugman's argument, Stephen roach, President of Morgan Stanley Asia, said rudely that krugman should be hit in the head. “His suggestion is totally wrong. We always blame China and ignore our own business.” Whether the trade gap is due to the Yuan’s exchange rate is debatable, he said, and encouraging Chinese consumers to spend would be a more effective way.

Chinese scholars have also conducted a series of scientific studies on such differences: when analyzing the relationship between Sino-US trade and the RMB exchange rate, Chou (2000)[89] found that fluctuations in the real exchange rate of the RMB against the dollar (conditional variances) have a negative effect on China's exports to the U.S. That is, when the real exchange rate of RMB against the US dollar fluctuates greatly, China's exports to the U.S. will decrease. However, the analysis does not mention the effect of the real exchange rate of RMB against the US dollar and the exchange rate of nominal exchange rate itself on the trade pattern between China and the U.S., but only analyzes the volatility of the real exchange rate. Artificially inflating exchange rate volatility to balance trade surpluses is obviously highly inappropriate, the articles of Zhang (2005)[90] , Lu and Dai (2005)[91] are not point at the imbalance of Sino-US trade, but are the analysis of China's overall foreign trade pattern. Take China to the world trade as the research object, Lu and Dai test the relations of the weighted real exchange rate fluctuations of RMB to the world's major currencies from 1994 to 2003 and long-term relationship between China's import and export with co integration vector auto regression method, the results show that RMB real exchange rate volatility has a significant influence on China's import and export trade, Marshall - Lerner condition was established, and J curve effect existed. Zhang [92] estimates the scale of the foreign investment, export volume, GDP and employment reduction caused by the exchange rate appreciation of different ranges by measuring the FDI function, the import and export function and the exchange rate elasticity of China. They concluded that exchange rate appreciation had a significant effect on imports and exports, but that the effect fell by more than half after three quarters and disappeared more

recently after seven quarters, and that exchange rate appreciation had no effect on trade imbalances in the long run. Then Wang and others (2007 Qu (2006) [93], Li (2006) [94] Gao (2009) [95] respectively used econometric analysis to show that the trade imbalance between China and the United States has no direct relationship with the RMB exchange rate, and came to the conclusion that the RMB appreciation can only alleviate the surplus to some extent in the short term, but has a weak effect in the long run. Yu (2009) [96] used a gravity model to study the impact of RMB appreciation on trade between China and the United States. The results showed that the appreciation of RMB significantly reduced China's exports to the United States. But it also points out that a continued appreciation of RMB could seriously hurt exporters and thus influence China's macroeconomic growth. The macroeconomic research center of Xiamen University team uses model to analyze the appreciation of the RMB (6% a year)[97], they concluded that such a rapid appreciation will cause a sharp decline in foreign trade surplus, but it will have seriously negative impact on China's GDP growth that may cause the economic crisis.

Theoretically, the exchange rate may be the main reason for the trade imbalance between China and the United States, but from the empirical research, there is still no strong evidence that the exchange rate change between the RMB and the U.S. dollar contributes to the trade balance between China and the United States.

3.3.6 Foreign direct investment in China and Sino-US trade imbalance

M. Blomstrom (1990) believes that FDI promotes the export trade of the host country: On the one hand, the direct effect of FDI on trade, that is, producing in the host country by foreign-invested enterprises and exporting their products abroad, which drives the export of the host country; On the other hand, FDI has an indirect effect on trade, that is, FDI promotes its export through its influence on local enterprises and technology spillover [98]. Liu (2007) [99] indicates that to some extent, the direct investment by the U.S. in China

through multinational companies has aggravated the trade imbalance between China and the U.S. The U.S.-based parent companies of these transnational corporations transport components and parts to their Chinese subsidiaries at above-average international prices, and then export them to other subsidiaries or parent companies at below-average international prices, for which China receives only a small processing fee. American multinationals convert the goods and services originally produced or exported by their own countries into the production and export of their subsidiaries in China, and correspondingly increase the import of the US parent company to the U.S. from its subsidiaries in China, thus expanding the U.S. trade deficit with China. Therefore, from the perspective of pure import and export statistics, the real economic relationship between China and the United States will be masked and the trade imbalance between China and the United States will be further aggravated. Xu, Hu (2008) [100] studied the correlation between the trade imbalance of China and the US and the US investment in China. They found that the US companies investing in China are mainly engaged in processing and manufacturing, and the proportion of processing trade in total trade is increasing, the proportion of manufactured goods exports in total exports is increasing, and China's trade surplus with the US is also increasing. Therefore, the Granger causality test is used to analyze the above phenomena and the results show that the export of manufactured goods has a two-way causal relationship with the US direct investment in China and it is significant. The promotion effect of the US direct investment in China on the export of manufactured goods and the total export is greater than that of imports, and the export of manufactured goods is the cause of the trade surplus between China and the U.S. There is a long-standing complementarily between the U.S. direct investment in China and Sino-US trade. If the more U.S. FDI flows into Chinese manufacturing, the more China exports to the U.S. and the larger the Sino-US trade surplus.

3.3.7 International industrial structure transfer and Sino-US trade imbalance

Nicholas, Lardy (1994)[101] indicated that over the past two decades, the division of production of manufactured goods has become more and more geographically subdivided, with each country having the strongest comparative advantage in processing only a portion of the product. Countries with high incomes and technological advantages became specialized in producing high-value-added components, while China, with its large unskilled labor force, gradually became the final assembly point for a range of products. Joint ventures and wholly foreign-owned enterprises are the main players in this process, and most of the investment comes from other Asian economies and used in processing and assembling such as: Hong Kong, Taiwan, Korea. Based on above inference, much of the increase in China's trade surplus with the United States is a result of other East Asian countries shifting their trade surpluses to the United States by shifting production to China. Gaulier, Lemoine (2009) [102] also indicated that China took advantage of the globalization of production and became an assembly base for Asian companies that extended their product and trade networks to China. China's position in product segmentation has stimulated trade in high-tech products, but the rapid technological upgrading of China's trade is closely related to its increasing dependence on foreign capital and technology. The emergence of China triggered a restructuring of production in Asia and a triangular trade pattern: Asia's relatively developed economies, which use China as an export base and export goods to the U.S. and Europe instead, now export intermediates only through china-based subsidiaries. Yin , Wang (2004)[103] compared China's trade balance with the U.S., China's total trade balance and China's trade balance with East Asia from a statistical perspective. The study found that since 2000, China's trade surplus with the United States has exceeded China's overall foreign trade surplus, which means that China's trade deficit with other countries is bound to grow larger and larger. The main source of this deficit is East Asia, and China's trade deficit with East Asia exceeds China's trade surplus with the United States. In order to obtain further favorable evidence that the expansion of China's trade surplus with the United States was transferred from some countries or regions in East Asia, they also examined the situation of the United States' foreign trade deficit. Although the US trade deficit with China has been increasing, the proportion of this deficit in its total foreign trade deficit has not increased significantly.

While the U.S. trade deficit with Japan and other East Asian countries has risen in absolute terms, their share of the total U.S. trade deficit has been declining, and if China and other East Asian economies are taken as a group, the U.S. trade deficit with East Asia as a whole has actually declined. It follows that China's huge trade surplus with the United States has largely been transferred from the rest of East Asia. Because other east Asia countries and regions constantly shift production to China, therefore, their exports to the United States shall be transferred to mainland China exports to the United States, if the comparative advantage between countries caused by economic globalization doesn't change, the change tendency that Sino-US trade imbalance will not change, and sustainable. Cho, Koo (2004) [104] proposed that since the Asian financial crisis, there are eight Asian economies of the substantial depreciation of currency to the dollar, the spillover effects between these countries brought great pressure to depreciate the RMB, but because of China shall practice a system of exchange rate peg to the dollar, the dollar and the Yuan move together, China kept its currency stability, and won the foreign investors huge credit. The appreciation of the U.S. dollar against other Asian currencies is bound to cause the appreciation of the RMB against these currencies. A stronger RMB gives China greater purchasing power in international commodity markets; this is bound to lead to increased imports from these East Asian countries and to increased exports of high-tech products to the United States. Thus, changes in trade patterns between China and the United States in high-tech manufactured goods are likely to depend on the relative exchange rates of the United States and East Asian countries rather than the bilateral exchange rates. China's exports to the United States in these three categories of goods were returned by trade openness, bilateral exchange rate between China and the US, weighted exchange rate between the U.S. and east Asia and dummy variable of exchange rate regime after dividing trade goods into primary products, intermediate technical manufactured goods and high technology manufactured goods, the results showed that the United States and east Asian countries exchange rate changes on China-U.S. trade, especially the significant effects of high technology products, and have no influence on low technology products.

3.3.8 The imbalance of internal structure and trade between China and the United States

Kang (2006) [105] believed that the fundamental reason is the imbalance between savings and investment in the domestic macroeconomic structures of China and the United States. The United States has a low savings rate for a long time, while China's domestic savings rate is too high due to demographic changes, lack of a sound social security system and lack of smooth financing channels. Therefore, the two countries should look inward to fundamentally improve China-U.S. trade imbalance. Zhao, Feng (2006) [106] believe that the internal economic structure imbalance between China and the United States is the internal cause of bilateral trade imbalance. The imbalance of the U.S. savings/investment structure and the imbalance of government revenue and expenditure lead to the US trade deficit with China. China's high savings, high investment and its "export-oriented" trade policies have led to a trade surplus with the U.S.

3.4 THE STUDY OF TRADE POLICY IN POLITICAL SCIENCE

Political science started very early in the study of trade policy, but it did not study trade policy alone, but put it into international policy for unified study. Its representative theory is "hegemonic stability theory". Since the 1970s, political scientists who made great contributions to the development of hegemonic stability theory include Stephen Krasner and Robert Gill. Although they hold different views, they all believe that the existence of liberal hegemony is indispensable to the stability of the international economic system and the maintenance of international peace. According to Charles Kindleberger（1981), the basic ideas of hegemonic stability theory include: “the basic conditions of controlling international economic system of Hegemony are:(1)Provide a market for surplus products;(2)Provide a stable source of capital, especially in times of economic decline; (3)When the international monetary system stops functioning because of panic, it can act

as a "rediscount" mechanism to provide financing;(4）Administer the foreign exchange system；（5）Ability to coordinate domestic monetary policies in different countries;(6)The international economy must clearly define and protect the basic property rights of goods and overseas assets as they operate”[107]Therefore, power is the basic element to maintain hegemony. Hegemony are favored by all countries for providing stability of the international economic system, a "public good". Kindleberger（1981）stressed that “There can only be one hegemony in the hegemonic stability system, otherwise the system will not be stable”. he indicated that “To stabilize the world economy, there must be one stabilizer, and only one stabilizer”. This is mainly because the difficulties and costs of negotiations between two or more countries can weaken international cooperation.

According to Peter J.Katzenstein’s research, the hegemonic gains of hegemonic states are influenced by the size of states and the scope of control over the international system, specifically, the expansion of national scale will increase the control cost of hegemony and control diminishing returns. Therefore, in the period of rising hegemony, hegemony will try their best to promote the openness of international political economy as far as their capabilities permit, and accordingly, international trade disputes will be reduced; on the contrary, when hegemony wanes, protectionism and deeper international trade disputes emerge. To some extent, hegemonic stability theory is a mixture of neo-realism and neo-liberal institutionalism. It is not only a belief and prejudice based on liberal ideology, but also an induction and summary of historical experience, which is very important for understanding American foreign policy. To some extent, this theory ignores the possibility that hegemony may abuse their power and position to seek their own interests, which may lead to instability. From the above literature review, it can be seen that political science and economics have relatively independent assumptions, analysis units and core issues on the decision of trade policy. However, the introduction of the theory of public choice broke the barrier between economics and politics and opened a new horizon for the study of political economy of trade policy.

3.4.1 Political economy as an explanation of trade policy

“Public Choice” theory also called new political economy theory and economic theory of politics, it is a theory and method to explain the relationship between the state and the market and the process of public policy with modern or neoclassical economic analysis tools. The central assumption of the theory is "political markets", which leads people to pay attention to the influence of political factors on economic decision-making and economic operation, thus becoming an important development stage of contemporary western economics.

International trade policy is an important part of the study of new political economy. With the opening up of national economy, international economic factors have more and more obvious influence on a country's foreign economic and trade policies, and the formulation process of tariff, non-tariff and other policies has become more and more complicated. As Bruno Frei points out, when the assumption of a closed system is relaxed into an open one, the mutual influence of politics and economy in the international economy becomes more obvious. The influence of such interaction is reflected in trade, investment, foreign aid and the role of international organizations.

Economists have proposed analytical models for applying the theory of "public choice" to trade policy. Characteristics of the relevant countries, for example, “predatory state "model (predatory state model) believes that the government for their own short-term interests, through trade tariffs or overvalued exchange rates and other means, to maximize short-term fiscal income or national wealth, significantly increased the short-term performance, but at the expense of long-term economic efficiency and economic development. Another example is the "commission-agent" model. However, the most extensive research is on the interaction among interest groups, politicians and the state.

On the process of endogenous formation of trade protection, many scholars have made in-depth studies and put forward different political economy models. Which have bigger influence are: "Optimal tariffs and retaliation", the classic thesis of H.G.Johnson (1953), in his seminal paper, he emphasized that under the assumption that governments would maximize their own welfare, they would benefit from tariffs even if other countries retaliated. On the basis of that, Mayer（1981）proposed a serials of effective tariff combinations of the models of two countries, include free trade. Later researchers have also used this theory to explain the purposes of trade agree. One of the more influential subsequent treatises on the political economy approach was co-authored by Stigler and Peltzman. Their model describes the motivation of pressure groups to seek political support and its effect on regulated prices, and concludes that the price of products in a particular sector is determined by the government in power maximizing its function of political support. Inspired by this, Hillman (1982) proposed a method to solve the optimal tariff. He believed that the optimal tariff was actually a problem for the ruling government to make a balance between the political support of interest groups and the dissatisfaction of consumers. Meanwhile, Feenstra and Bhagwati（1982）built a model of a single industry that took politics into account, and allowed for political lobbying by two interest groups, the owners of capital and the unions.

Later, Mayer（1981）[108] constructed a model of trade under direct democracy. In short, he argues that trade policy is the result of a majority vote on the tariff scale, and that governments tend to choose the tariff rate preferred by centrist voters. Magee，Brock and Young(1989)constructed the model of trade policy making of interest groups under indirect democracy, which made outstanding contributions to the study of trade policy political economy. In their model, interest groups can donate to two different political parties to increase their chances of winning an election. The difference between the two parties is that one is pro-free trade and the other pro-protectionism. Under the assumption that each lobby is associated with only one party, they discuss a two-stage game: In the first phase, each party announces its policy preferences; in the second stage, interest groups choose

different donation strategies to influence the probability of a political party being elected. By solving this game, we can get the perfect Nash equilibrium of sub game of contribution strategy. They showed that this Nash equilibrium was a function of tariff policy in fact.

“Protection for sale” model of Hellman and Grossman（1994）is the most significant theoretical contribution of political and economic analysis of international trade so far [109].In their model, national governments not only maximize welfare, but also the contributions they receive from each lobby. Hellmann and Grossman analyzed two levels of strategic interaction between domestic interest groups and government officials, as well as strategic interaction between governments in the international field. Through the analysis of the non-cooperative and cooperative tariff game model, the protection agency model is a good example of how domestic politics determines the government's national goals. [110]

Hiscox (2002) investigated the changes in the level of factor liquidity and its impact on the foundation of trade and political union, his research attracted wide attention. He pointed out that under the condition of "low" factor mobility; the political alliance around trade policy is mainly based on industry, which is an industrial alliance. At the same time, the contents of the alliance diverge over trade policy, forcing so-called “peak associations”, which claim the interests of the groups, to take a "vague" policy stance. Industries are aggressively lobbying for influence in their favor. However, when factor mobility is high, class-based "class alliance" is more likely to emerge. At this time, the group tends to have a united position on trade issues, that is, relatively scarce factors require protection, while relatively abundant factor endowment trade liberalization. In this case, and the lobbying activities of industry organizations themselves are not active.

Deisler（2006）[111] combined economics and politics, highlights the political logic of American trade policy, comprehensively and systematically discusses American trade politics and policies, and has a high degree of insight on new trade protectionism and the

political consensus of the two parties in the American congress on foreign trade.

Sheng（2002）[112]applied the theoretical and conceptual framework of international political economy to the analysis of China, clarified the overall framework of China's trade policy decision-making, and analyzed the government behavior, decision-making process and institutional constraints of China's trade policy making from three aspects: national goal and authority, domestic interest groups and foreign governments, and international trade system; Liang（2006）[113] constructed the general equilibrium model of the us trade policy towards China and studied the U.S. trade policy towards China from the perspective of the interactive game between China and the U.S. Ma and Li（2007） made a political and economic analysis on the evolution process of American trade policy making from the perspective of interest groups; Wang Ling（2006）used the dynamic game model to analyze the political economy of trade friction between China and America; Zhang（2007）[114] analyzed the political and economic factors of the U.S. trade policy decision from the perspective of national and social interests by establishing the model of the game between the government and interest groups; Wang（2007）[115]proposed an analytical framework of three-dimensional state-market-society interaction and analyzed the political logic behind China-U.S. economic and trade relations; Li（2010）studies how the institutional changes at the macro, medium and micro levels in the United States affect the formulation of international economic policies from the perspective of institutional change; Wang（2011）[116]revised and extended the model of trade policy under direct legislation and the decision-making and forming mechanism of trade policy under delegation of authority.

3.5 SUMMARY

First, there are few theoretical studies on the trade imbalance between China and the United States, and there is not a unified system for the theoretical models mentioned above. Therefore, I think a deeper theoretical study should be carried out.

Second, the trade imbalance between China and the United States is a complex issue. I think it can also be examined from the perspective of political economy.

Third, whether the change of RMB exchange rate will better solve the trade imbalance between China and the United States has not been quantitatively analyzed through the model. I think more in-depth research can be conducted in this regard.

Fourth, the impact of the trade imbalance between China and the United States can also be analyzed by selecting cases of trade friction between China and the United States through qualitative research, thus achieving multi-angle verification.

4. METHODOLOGY

4.1 CHAPTER OVERVIEW

This chapter presents the research methodology of the research. It mainly includes six parts: research approach, research design and research strategy, data collection and analysis, research ethics, reliability and validity, and the limitations of this research.

4.2 RESEARCH APPROACH

Research approach refers to the starting point and key point for researchers to observe, summarize, classify and analyze the research objects (such as political phenomena). Since the focuses are different (different research approaches), there is a group of matching concepts as the analytical framework. [117]

As Pawson summarized, the main reason for researchers to combine quantitative methods with qualitative ones is that the society is multifaceted, multi-layered and multi-perspective, which is widely accepted by social science researchers. [118]

This research starts with the analysis of quantitative data and then carries out qualitative analysis. Mixed research methods are used in this paper to strengthen and deepen the research findings, and cases are applied to further explore relevant conclusions. Quantitative analysis can produce preliminary conclusions and some analytical structures, while qualitative analysis is the primary source of abundant and depth information. This is

a mixed research strategy.

4.2.1Quantitative research

Quantitative research is to explore the regularity of phenomena under the guidance of positivist methodology. It is a process of deductive reasoning from the research of general phenomena to special situations. In addition, quantitative research lays an emphasis on calculation and measurement, so it mainly describes the research in numbers. Therefore, the quantitative analysis mostly uses data to establish mathematical model based on the statistical data, and then calculates the indicators and values of the analysis objects by using the mathematical model, and finally draws conclusions.

Quantitative analysis can use representative samples to describe the influencing factors of Sino-US trade and the impact of Sino-US trade imbalance on the two countries. Particularly, the charts of quantitative data can intuitively show the influencing factors of Sino-US trade and how they are correlated with Sino-US trade imbalance. China Statistical Yearbook, China Customs Statistical Yearbook, the website of the US Department of Commerce and the website of the US Bureau of Economic Analysis include some variables related to the Sino-US trade characteristics and Sino-US trade imbalance, which can fulfill the above tasks.

4.2.2Qualitative research

At present, a unified view on the definition of qualitative research has not yet been formed. The academic circles generally acknowledge that qualitative research refers to that, "In the natural environment, field experience, open interviews, participatory and non-participatory

observation, literature analysis, case survey and some other methods are used to conduct in-depth, detailed and long-term research on social phenomena; the analysis mode is induction dominated, first-hand local information is collected, the significance of the parties' behaviors and their viewpoints on things are understood from their perspective, then on this basis, hypotheses and theories are developed to test the research results by means of falsification and correlation test; the researchers themselves are the main research tools, and the influence of their personal background and relationship with the research objects on the research process and results should be considered.

The historical approach is to state the evolution of relevant issues from a historical point of view by using historical facts, to explain the causal relationship, and to make a prediction of future development. This paper studies the trade history of China and the US from the end of the 18th century to the beginning of the 21st century, so as to explore the rules of the influence of the government policies of the two countries on the Sino-US trade imbalance.

The literature research approach is to identify the authenticity of the past event and to verify the views on the event based on all kinds of existing historical materials, official materials and other documents and by means of systematical and objective definition, comment and demonstration. This is the most common method in research work, as well as an essential process for every research. Since the above research methods use the secondary source data, the understanding of things will be somewhat biased because of the author. Hence, even with the same discussion topic, it is necessary to widely collect data and do a lot of reading, so as to seek out neutral viewpoints and lay a good foundation for the following research of the first-hand data. [119] some scholars, government agencies and research institutions have carried out research on Sino-US trade imbalance. They gradually realize that Sino-US trade imbalance is no longer a superficial problem reflected by trade figures, but a dynamic imbalance problem affected by a variety of factors. After reading a large number of literatures, the author discovered the main influencing factors of

Sino-US trade, thereby providing a direction for national policies to affect Sino-US trade balance.

Case study approach is a kind of field study. Researchers select one or several scenes as the objects, systematically collect data and conduct in-depth research, so as to investigate the situation of a phenomenon in real life. This approach is applicable to situations where the boundary between a phenomenon and actual environment is obscure and difficult to distinguish, or researchers cannot design accurate, direct and systematic control variables, and applicable to research problems of "how to change", "why becomes so" and "what is the result". Meanwhile, the approach covers distinct design logic, specific data collection and unique data analysis methods. Field observation can be adopted, or information can be obtained through document research.

This research will gain the information through documents and select the cases of Sino-US trade friction to analyze the impact of Sino-US trade imbalance on the two countries.

4.3 RESEARCH DESIGN AND RESEARCH STRATEGY

The research design aims to provide an appropriate framework for the research. A vital decision in the research design process is the choice of research method, because the method determines how relevant information is obtained, but the research design process involves many related decisions.

The core issue of this research is the determinants and influence of Sino-US trade imbalance. The overall idea of this paper is to sort out the history of Sino-US trade to find out the important influencing factor of Sino-US trade relations and even Sino-US relations, namely, the Sino-US trade imbalance. Then the existing literature is reviewed and

summarized. After that, the influencing factors of Sino-US trade imbalance are analyzed by using the segmented trade data, the main reasons for the emergence and aggravation of Sino-US trade imbalance are particularly analyzed, and discussion is carried out respectively from three levels of macroeconomics, political economics and international trade. Next, the impact of Sino-US trade imbalance is analyzed. Finally, policy suggestions are put forward for the adjustment of Sino-US trade imbalance.

This research is mostly conducted from the empirical perspective, so various research methods and tools of international economics and econometrics need to be comprehensively used. Specifically, the research methods adopted in this paper include: first, statistical analysis methods, including ratio analysis method, trend analysis method and graphic method. Statistical analysis method can be used to conduct descriptive analysis on the data, so as to find out the basic statistical and correlation between different variables; second, econometric analysis methods. As to the macro-economic factors of Sino-US trade imbalance, the impact of the changes in saving ratio and exchange rate of China and the US on Sino-US trade imbalance is tested by empirical analysis, including stability analysis, co-integration analysis and so on; third, case analysis method. In the analysis of the impact of Sino-US trade imbalance, the cases of Sino-US trade conflict are selected for research.

4.4 DATA COLLECTION AND DATA ANALYSIS

4.4.1 Data collection

The required data is obtained from the secondary data to prove the hypotheses. The secondary data is mainly acquired from some mature databases. Although Zhou (2007) [120] believed that the databases may have some errors, so it is necessary to review them

before use in order to ensure the internal effectiveness of the research. When extracting data from the databases, the data needs to be screened to effectively control the extraneous variance and ensure the internal effectiveness. For example, Li, Miller and Eden (2006) [121] selected enterprises from emerging markets in ten countries such as China and Brazil, which entered the US market, so as to control the interference of government barriers and reduce reporting errors. Since the secondary data is acquired from mature databases, the external effectiveness of the research is guaranteed.

The secondary data includes qualitative data and quantitative data. Before use, the qualitative data needs to be quantitatively processed. The quantitative data needs to be converted before use to effectively measure the research constructs. In this research, the influence of Sino-US trade structure and Sino-US trade policy on trade imbalance cannot be directly learned from the secondary data, and the data representing the above concepts is obtained through calculating and processing.

Because the source of the secondary data is particular, the research method has the following advantages：

a. The longitudinal data of time span can be obtained, which can help the researchers to better explore the causal relationship. For example, the data can be processed into the form of N-period lag, thereby better analyzing the lag effect of independent variables.
b. b. It has high objectivity
c. c. It has high reliability, which is superior to the research with first-hand data

China Statistical Yearbook, China Customs Statistical Yearbook, website of the US Department of Commerce and website of the US Bureau of Economic Association cover some variables related to Sino-US trade characteristics and Sino-US trade imbalance, and they are important sources of data in this research.

4.4.2 Data analysis

a. Descriptive statistics

Descriptive statistics is an aggregation of a type of statistical methods, which reveals the characteristics of data distribution. It mainly contains data frequency analysis, data centralized tendency analysis, data dispersion analysis, data distribution and some basic statistical graphics. The descriptive statistical analysis is mainly conducted by using the Excel software.

b. Regression analysis

Regression analysis is one of the most extensively used data analysis methods. It establishes the appropriate dependency between variables based on the observation data, so as to analyze the inherent law of the data.

In this research, EVIEWS is used to study the macroeconomic factors of Sino-US trade imbalance, and the least square method is applied to carry out regression analysis on the model of the impact of savings and exchange rate on Sino-US trade balance.

4.5 RESEARCH ETHICS

Adhering strictly to all the ethical guidelines serves as standards about the honesty and trustworthiness of the data collected and the accompanying data analysis.

4.6 RELIABILITY AND VALIDITY

The analysis results obtained from the model and statistical software tend to be reliable and valid. In this research, the causal relationship between the research problem and the collected data is established, and econometric models and analysis software such as Eview are used to increase the accuracy and repeatability of the results.

Triangulation. Different methods were used in this research. In each phase of research more than one method was used.

Peer review or debriefing. This research was supervised by two professors who were keen to check it and discuss its results with the researcher.

4.7 LIMITATIONS OF THIS RESEARCH

Due to the lack of some actual statistical data on Sino-US processing trade and the direct investment of the US in China's processing assembly industry, it is impossible to deeply study the relationship between the direct investment of the US in China's processing assembly industry and the US trade deficit with China caused by the processing trade.

The Sino-US trade imbalance is a complex problem, which also can be investigated from the perspective of industrial organization theory and incomplete contract as well.

4.8 SUMMARY

This chapter introduces the methodology of this research. The method of quantitative research is used to collect data, and Sino-US trade imbalance is analyzed by using econometric model, Excel and Eview. At the same time, qualitative research methods, including historical analysis method, literature analysis method and case study, are used to analyze the regularity of Sino-US trade imbalance. The combination of quantitative and qualitative analyses can increase the reliability and validity of this research.

5. FACTORS IN THE SINO-US TRADE IMBALANCE

5.1 CHAPTER OVERVIEW

This chapter discusses the factors of China-US trade imbalance, including the analysis of macroeconomic factors such as savings and exchange rates. This chapter also analyzes the various factors that affect the China-US trade imbalance, ranging from the trade structures, policies, modes, statistical methods, international industrial transfer and the conditions in East Asia, to the US direct investment in China. In addition, this chapter tries to build a model and adopt EVIEWS to assist in the analysis of the collected data. It also uses extensive descriptive statistics to analyze the collected data. This chapter has six parts. First, it discusses the macroeconomic factors of China-US trade imbalance, such as savings and exchange rates. Second, it analyzes the trade structural factors leading to the imbalance. Third, it explores the influential trade policies. Fourth, it discusses the difference of trade statistical methods between China and the United States. Fifth, it analyzes the trade modes that affect China-US trade imbalance. In the sixth part, it explores the US direct investment in China that affects China-US trade imbalance.

5.2 MACRO-ECONOMIC FACTOR S OF SINO-US TRADE IMBLANCE

At a macro level, economists commonly believe that savings and exchange rate are closely related to trade balance. The underestimation of the RMB exchange rate can provide relatively low prices for products made in China, while the booming domestic demand in

the United States provides a massive external market for China. Hence, in this section, the Sino-US trade imbalance is mainly studied from two aspects of savings and exchange rate.

5.2.1 Saving factor

Saving is the remaining part of output or income subtracting consumption, and it is an important indicator of macro economy. Saving is the counterpart of consumption. If the national income is simply broken up into two parts of consumption demand and saving, then the demand factor can be replaced by saving factor. In other words, high demand tendency means low saving tendency, and the two has precisely the opposite effect. Keynes' national income balance theory implies the relational expression that the balance between savings and investment is identically equal to the balance on trade account, that is, if a country's saving is higher than investment, then the balance of international trade will be favorable, otherwise, it will be adverse. However, from the dynamic perspective, if the investment remains unchanged and the country's saving increases and consumption decreases due to some external factor, then the country will still usher in a trade surplus. If the saving keeps rising, then the country's trade surplus will continue to increase. Saving ratio is the ratio of saving to output or income, which can better reflect the level of saving than the absolute amount of saving. Therefore, more attention is paid to the changing situation of saving ratio. [122]

The national aggregate savings can be divided into personal saving of the residential sector, business saving or corporate saving of the enterprise sector and government saving or public saving of the government sector. The personal saving is defined as personal disposable income subtracting personal consumption; corporate saving is defined as year-end undistributed corporate profit. The government saving is defined as government revenue subtracting government nonproductive expenditure.

5.2.1.1 The national saving ratio of China

The reform and opening up was proposed and established by Deng Xiaoping, the second generation of top leader of the PRC. It covers a series of economic-dominated reform measures implemented after the Third Plenary Session of the Eleventh Central Committee on December 18, 1978, which can be summed up as "domestic reform and opening to the outside world".

After the implementation of the reform and opening-up policy in 1978, China has gotten rapid economic development, which has promoted the sustaining and rapid expansion of the investment scale, but the growth rate of domestic savings is far higher than that of investment, thereby generating a large amount of savings surplus in China.[123]

Table 5: National Aggregate Saving Ratios of China over the Years

Time	National Aggregate Saving Ratio of China %
2000	38.50
2001	38.39
2002	39.43
2003	42.51
2004	45.26
2005	46.38
2006	48.14
2007	49.86
2008	50.78

2009	50.63
2010	51.79
2011	49.80
2012	49.69
2013	48.79
2014	49.41
2015	47.70
2016	45.88
2017	46.20
2018	45.29

Sources：Federal Reserve Date Base [124]

After the reform and opening up in 1978, China's national saving ratio has been continuously rising. As the 2000-2018 data in the table above shows, China's national saving ratio was 38.50% in 2000, while the ratio rose to 45.29% in 2018.

Whether it is for residents or enterprises in China, the investment channels are very limited after the gain of income, and what they can only do is to continuously improve their saving ratio, which can lead to a ceaseless rise in China's national saving ratio. Since the traditional ideas and consuming behaviors of Chinese residents can hardly change within a short period of time, after absorbing such vast sums, the banks will definitely provide strong financial support to the country's infrastructure construction and product reproduction. In view of the different corporate properties, different types of Chinese enterprises have different abilities to obtain funds from banks. Non-state-owned enterprises are very worried about future financing, they tend to invest a large amount of accumulated undistributed profits in reproduction or reserve them, leading to a continuous improvement

of China's export capacity. In terms of China’s saving situation, Chinese people have been converting their income into savings, which has restrained the domestic consumption and reduced the demand for imported goods. The reduction of imported goods can lead to the aggravation of Sino-US trade imbalance.

China's overall situation is that the domestic national saving ratio is excessively high and there is a large amount of saving glut, while the Sino-US international trade has accumulated huge trade surplus. Internationally, in the absence of more secure investment channels, the huge trade surplus can only be converted into the US dollar assets dominated by the US treasuries. China has provided a large amount of capital to support the US economic development, which has led to the continuous imbalance of Sino-US trade.

Since the reform and opening-up, it has been over 40 years and China has been making efforts to expand government investment and build infrastructure. China's high national savings provide fund guarantee to the government. According to the data released by the National Bureau of Statistics of China, the aggregate investment of fixed assets of the whole Chinese society in 2019 was 55.1 trillion Yuan, while the figure in 2000 was 3.3 trillion Yuan, with an increase of 16.69 times over 19 years .[125]The fast-growing investment scale will be inevitably transformed into massive infrastructure construction and manufacturing industries, which will undoubtedly increase the export volume of low-end traded goods and promote the continuous expansion of the volume of Sino-US trade surplus. China is exerting its comparative advantage in international trade, increasing its infrastructure construction and gradually changing from a global product manufacturing base to a more perfect industrial structure. Most of the banks and large-scale enterprises in China are state-owned, and the ability of each resident is very limited. There is no mature financial market in China, so the residents can only deposit their money in banks with a very low interest rate and endure a high inflation rate. This has resulted in the huge gap between saving and investment in China. Although China's rapid economic growth is supported by the high national saving ratio, the growth rate of savings is far higher than

that of investment on the whole.

At present, the rapid development of China's economy cannot be separated from the financial support brought by the high national saving ratio. Chinese enterprises have gained huge economic benefits through investment, and some companies tend to pay higher wages to the employees. Meanwhile, enterprises further invest their profits in expanded reproduction, and thus boost the growth of China's national saving ratio. [126]For Chinese private enterprise, due to the imperfect financial system, the information opacity and the weak anti-risk capability, the financing channels are very narrow; hence, the enterprises must reinvest the undistributed profits through their own accumulation, so as to promote the upgrade of the corporate industrial technology and equipment and drive scale production of the company. For residents, most of the middle class have accumulated a certain amount of savings through hard labor to prevent the possible instability of their future life. China's regional economic development is unbalanced, and a large number of migrant populations provide the labor needed by economic development, making the growth rate of China's economy much higher than that of wages. Through expanded reproduction, China's domestic aggregate supply is greater than its aggregate demand, and the excessive production capacity has to be exported through international trade to be resolved. Such economic development model will inevitably lead to increasingly severe Sino-US trade imbalance.

5.2.1.2 The US national saving ratio

In modern times, the US has seized the historic opportunity of electronic information technological change and applied advanced production technology to promote the upgrade of its domestic industrial structure and the perfection of its economic structure. Then the American economy as a whole began to change qualitatively, and the US domestic economy has undergone earth-shaking changes. The GDP of the US increased rapidly and the production efficiency has been constantly enhanced. Meanwhile, the inflation and

unemployment rate have been controlled at a low level. Since the 1990s, under the excellent situation of the American economy, the gap between the US savings and investment has been enlarged year by year. To cope with this adverse situation, the US took advantage of the status of the US dollar, which is a global settlement currency and the major currency for foreign exchange reserves, as well as the mature American financial market to make up for the deficiency of domestic savings. After entering the 21st century, this trend has become more prominent. The American economic development and the improvement of scientific and technological level need the support of lots of funds, but the US national saving ratio has been decreasing, which can hardly meet the needs of the US economic development and domestic investment. Hence, the US needs continuous capital inflow from other countries to support its economic development.

Table 6：National Aggregate Saving Ratios of the US over the Years

Time	National Aggregate Saving Ratios of the US%
2000	20.2
2001	18.9
2002	17.9
2003	17.3
2004	17.8
2005	18.3
2006	18.6
2007	16.9
2008	14.8
2009	14.0
2010	15.6

2011	16.8
2012	18.3
2013	18.9
2014	20.0
2015	19.4
2016	18.2
2017	18.3
2018	18.1

Sources：Federal Reserve Date Base

According to the 2000-2018 data in the above table, the national saving ratio of the US shows a decreasing tendency. In 2000, the US national saving ratio was 20.2%, and the figure dropped to 18.1% in 2018.

The US has developed financial market and the Americans have excessive consumption habit, the household consumption expenditure rises rapidly, but the income did not increase synchronously. From the perspective of the whole market, the commodities produced in the US domestic market cannot meet the domestic consumption needs; hence, without goods imported from the foreign market, the US must bear the high inflation rate. There is a complementary relationship between a country's saving ratio and its demand for foreign capital. With high saving ratio, the demand for foreign capital decreases; in the case of low saving ratio, the demand for foreign capital increases. China's domestic high saving ratio has led to the large supply of foreign capital, while the low saving ratio in the US makes its demand for foreign capital increase continuously. A large amount of capital flows from China to the US, which generally needs to be balanced by the current account trade deficit.

In view of the actual situation of China and the US, with the increase in China's national saving ratio, China’s domestic investment will increase, while export has been an effective way to boost China's economy and deal with excess production capacity, a majority of the domestic investment will flow to the field of export production, thereby promoting the growth of the entire export production and leading to the growth of China's trade surplus in Sino-US trade. Meanwhile, when the national savings increase to the extent that they cannot be consumed by investment, the essence of capital seeking profit will be fully demonstrated, and the excessive savings will cause capital account deficit in various forms. High national saving ratio can lead to reduced demand for imported goods. In addition, China already has excess production capacity, and a large number of Chinese products need to be digested by exports. For the US, because of its low national saving ratio and excessive consumption mode, the US has to import a large amount of goods and capital from other countries, and thus the US trade deficit in Sino-US trade continues to increase.

The long-term excessive domestic consumption demand in the US has led to the low national saving ratio, which is a key factor of the long-term sustaining trade deficit of the US to China in international trade. As the largest economic entity in the world, the US should assume the responsibility of maintaining the stability of the world economy, and gradually reduce the implementation of quantitative easing policy according to the economic development. In addition, it should maintain the stability of the dollar exchange rate, gradually increase the national saving ratio and restrain the excessive consumption behavior of the residents, thereby alleviating its trade deficit and maintaining the overall stability of international trade. The in-depth research of the US domestic economy shows that, because of the developed security system and financial market in the US, a variety of financial products are flooding the American market, and the residents rarely convert their income into savings, instead, they invest in the financial market or use the money borrowed from the financial market for excessive consumption. The government has no force of constraint on such behaviors, and it cannot timely supervise and effectively control financial risk, as a result, the financial market has become an effective channel for

American national consumption to get funds, and greatly encouraged American residents to use their future income for current consumption. Due to the American consumers' tendency of low savings and high consumption, the US needs to import a large number of consumables from China; moreover, the US domestic accumulation is unable to meet the demand of economic development, so in the face of trade imbalance, it has to obtain international capital inflow to support its economic development. The US treasury enjoys high reputation worldwide because of its stable income and low risk, and it is irreplaceable compared with other government bonds, hence, it is the main channel for other countries to obtain investment income from foreign exchange reserve. The international capital continues to flow into the US and becomes the core impulse for economic development.

5.2.1.3 Difference in national saving ratio between China and the US and Sino-US trade imbalance

At present, China's high national saving ratio can stimulate the increase of the gross volume of export, while the high consumption and low saving ratio of the US can stimulate the imports of more commodities from China, which has led to the long-term Sino-US trade imbalance. In the Sino-US trade, the national saving ratio affects the whole conductive process, where capital accounts and current accounts interact with each other and affect each other. The inflection point of the difference in national saving ratio between China and the US appeared around 1999. Since 2000, China's national saving ratio has been rising continuously at a high level, while the US national saving ratio shows a decreasing tendency. According to the table above, the national saving ratio of the US fell to the lowest point of 14.0% in 2009 and then slowly rose again to 16.8% in 2011. The US needs a large amount of foreign capital inflow to support its financial market, and thus new capital supply can be generated to meet the active domestic consumption demand. This makes the US more inclined to directly import cheap and fine products from China, thereby making the consumption demand of the US an engine for the economic growth of various countries in the world. From the perspective of the division of labor and industrial

structure of Sino-US trade, the two countries complement each other in trade and get what they need, and the huge savings gap of the US provides favorable terms of trade for China's commodity import. For China, because it is in the economic transition period, the saving ratio in China has been the highest in the world. Since the reform and opening-up policy in 1978, China's domestic investment demand has been very brisk. After 40 years of development, in contrast with the rapid growth of the national saving ratio, the predicament that investment plays an increasingly diminished role in promoting economic development is obvious in China, and the Chinese products can only promote domestic economic development through exports. With the huge capital and consumption gap in the US, China has the ability to provide a large amount of funds and products to the American market. Due to the huge difference in the saving ratio between China and the US, the US needs to constantly increase imports, while China needs to drive economic development with exports, and China’s gross volume of export rises continuously. Under the combined action of the above factors, the Sino-US trade imbalance has been further aggravated. In the Sino-US trade, China's long-term sustaining and huge trade surplus can be hardly changed within a short period of time, and can even increase with the economic growth and trade development of China and the US.

At the current stage of economic development, the basic manufacturing industry in the US has been basically transferred to foreign countries. The US needs to import a large number of goods from China, which are attractive in price and quality, thereby meeting the needs of its domestic consumers under the environment of low income growth, while the Sino-US trade deficit returns to the US from China in various forms to support the economic development. Compared with other government bonds, the US treasuries are well received in the world because of the political stability of the US and the high reputation and stable income of the bonds. Many countries in the world, including China, take the US treasuries as their largest foreign exchange reserve assets. The trade between China and the US is becoming more frequent, both countries regard each other as the most important trading partner. The trade between China and the US is mainly settled by the US

dollar. If the scaled reserve assets are adjusted, the fluctuations in the US dollar market can easily occur, which can increase the risk of the national foreign exchange market. The imbalance of saving ratio between two countries often leads to the situation where the surplus country invests or transfers its huge foreign exchange reserves to the deficit country in the international trade, thereby promoting the proceeding of consumption in the deficit country, in this way, the mode of export trade stimulating economy will not be interrupted, and the trade imbalance between the two countries continuously intensifies.

Superficially, the trade between China and the US seems to be China's continuous accumulation of trade surplus in the international trade. However, the US is the issuing country of the US dollar, an international currency, thus, the foreign exchange reserves accumulated by China in the trade and the excessive national savings of China ultimately can only flow back to the US. The US absorbs China's foreign exchange reserves into the US economy in the form of US treasuries at a lower interest rate. As the largest developed country in the world, the US occupies an absolute dominant position in Sino-US trade, and various countries in the world have joined in the competition for exporting to the US. This makes the US the maker of trade rules and systems, and it damages China's interests by using various trade barriers and trade systems. Because the national saving ratios of China and the US are different, China is in an economic situation of high saving ratio and sustaining trade surplus in the Sino-US trade. In this way, taking a broad view of all the countries in the world, the US treasuries have the highest investment superiority, hence, China has to convert the US dollars gained from trade into the US treasuries, and the domestic US dollar foreign exchange market in China is adequately supplied. The holding of huge foreign exchange reserves by the Chinese government is equivalent to the issuance of RMB of the same amount. The basic currency of RMB is oversupplied and the inflationary pressure is prominent in China. If China fails to control the trend of outside appreciation and inside depreciation of RMB, the trend will not only be unfavorable for China, but also encumber the rapid development of Sino-US trade.

In international trade, the difference of national saving ratio between China and the US is a significant cause for the sustainable growth of China's trade surplus to the US. The economic development level, the characteristics of industrial structure and the foreign trade policies of China and the US determine that China's trade surplus to the US was not brought about by the export of high-technology industry or the increase of the national labor productivity, but by the export of China’s natural resources and products produced by cheap labor force to the US. Under such trade mode, it is costly for China to accumulate the US dollar foreign exchange reserves, which can consume a great amount of domestic resources and sacrifice the labor welfare of Chinese people. In Sino-US trade, Chinese products are cheap in the US market, and the added value is very low, which is prone to cause trade friction. The huge trade surplus China obtained in Sino-US trade has caused the continuous expansion of the scale of China's foreign exchange reserves. Because the US dollar is the main settlement currency adopted by most countries in the world for international trade, the majority of China's foreign exchange reserves have become the US treasuries, which makes China's foreign exchange reserves, which are obtained at a high price, flow back to the US through the financial market. The US makes use of the issuing position of the US dollar and adopts quantitative easing policy to depreciate the US dollar assets, and acquire asset premium income by increasing the issue volume of the US treasuries.

The big difference in saving ratio between China and the US can be helpful to the development of Sino-US trade. China's national saving ratio far surpasses the domestic investment demand, there is a large amount of saving balance, the US national savings are far below the domestic investment demand, and savings gap exists. To meet the booming consumption demand of the US and make up for the savings gap, the US has borrowed savings from China. To this end, China has solved the investment problems after obtaining foreign exchange reserves, and gained stable income at low risk. Thus it can be seen that the difference in national saving ratio between China and the US makes the two countries take what they need and is more conducive to the long-term stable economic development

of the two countries. China's capital flows to the US through the purchase of the US treasuries, while the US makes direct investment in China by transnational enterprises. When accepting the inflow of China's foreign exchange reserves, to protect its domestic industries, the US has introduced various policies to restrict China's capital investment in the construction and acquisition of the American domestic enterprises, and it is more willing to see the inflow of China’s capital through the monetary market and capital market via bonds or diversified investment. The direct investment of American transnational enterprises in China can help Chinese enterprises to improve their management level, production efficiency and product performance, which can in turn serve the domestic consumption of the US. The US enterprises control Chinese enterprises through new construction or M&A, and transfer backward industries to realize the vision of global division of labor. The demand of the US precisely coincides with the actual demand of China in the stage of economic transition. Hence, the difference in saving ratio between China and the US can improve the capital flow and industrial distribution of the two countries, and accelerate the transformation of China's economic industry. The economic growth of the US can be mostly attributed to its domestic market demand, while China mainly relies on export trade and investment to develop economy. The influence of the US economy and market on Sino-US trade imbalance is greater than that of China. The economic development of the US needs continuous inflow of the foreign exchange reserves of other countries to its domestic financial market in the form of capital, while China is just a typical country which provides the capital. In the absence of the inflow of a large amount of foreign capital to the US, first the exchange rate of the US dollar will decrease, then the economy will develop slowly and the American domestic market will shrink, which will reduce the US demand for imported goods. It is exactly the export economic growth mode represented by China that provides a great deal of money to support the US, thereby ensuring the rapid economic growth of the US, maintaining a low inflation rate, stimulating the American domestic market demand and indirectly aggravating the Sino-US trade imbalance.

In conclusion, the difference in saving ratio between China and the US is an important cause for the sustainable increase of China's trade surplus to the US in the international trade. China's national saving ratio is excessively high, with a large amount of saving gluts. Meanwhile, China has accumulated huge trade surplus through the Sino-US trade. Since there is no more secure investment channel in the world, Chinese people can only convert the huge trade surplus into US dollar assets dominated by the US treasuries, which provides a large amount of capital to support the economic development of the US. In addition, the high consumption of the US can increase imports, while the high savings of China can increase exports, thereby resulting in the long-term Sino-US trade imbalance as well as the gradually enlarged trade gap between the two countries.

5.2.2 Exchange rate factor

The nominal exchange rate can affect the real relative price of two countries by affecting the effective exchange rate, and thus ultimately affects the trade balance between two countries. A number of scholars in China and abroad have conducted numerous studies on whether China manipulates the nominal or effective exchange rate and gains trade surplus in this way, and the conclusions are highly inconsistent.

5.2.2.1 Historical changes of RMB exchange rate system

a. 1949-1980 is a period of China's national economic rehabilitation and planned economy. The RMB exchange rate became basically stable at first, and then the system of pegging a basket of currencies was implemented.

In this stage, the Chinese government exerted relatively strict control over the exchange rate. Even the single floating exchange rate system implemented between 1949 and 1952

was strictly controlled by the central government. During this period, the RMB exchange rate had little fluctuation and basically remained stable, which is closely related to China's planned economic system and the then international environment.

b. From 1981 to 1993, China’s economy was in a transition period, the RMB exchange rate adopted in this period was a dual exchange rate, that is, the official exchange rate and the market-regulated exchange rate coexisted, which is also known as double-track system.

The market-regulated exchange rate was limited to foreign exchange settlement in import and export trade, while the official exchange rate was mainly applicable to foreign exchange settlement under service accounts such as tourism, transportation and insurance and current transfer accounts. This is an exchange rate system arrangement for the transition period. The government's objective of exchange rate policy in this period was to promote exports and maintain balance of international payment. The development of the foreign exchange adjustment market based on the foreign exchange retention system has played a positive role in the exports of enterprises, the foreign exchange flow of foreign-funded enterprises and the monetary policy of the central bank. The exchange rate arrangement of the double-track system possesses the characteristics of planning and marketing, it is a product of the transition of China's economic system. In this period, the exchange rate system had the following advantages: on the one hand, it adapted to the characteristics of the original planned economic system, and the government could effectively control the foreign exchange; on the other hand, the capital market could be gradually opened and act on international convention. However, the RMB exchange rate simultaneously existed in two separated markets, which would inevitably lead to the instability of the exchange rate and provide an excellent living space for the black market of foreign currency. Broadly speaking, the arrangement of the double-track system adapted to the complex economic environment at that time and made positive contributions to the smooth transition of China's economic system reform.

c. China’s managed floating exchange rate system of dollar peg from 1994 to 2005

In 1994, the RMB exchange rate system underwent a significant change. The official exchange rate of RMB was integrated with the foreign exchange regulated price, and a simplex RMB exchange rate system based on the market mechanism was implemented. The previous practice of intervening exchange rate by administrative means was changed, the fluctuation in exchange rate was mainly based on market supply and demand, and the market mechanism was fully exerted to regulate the foreign exchange market. Since then, the RMB exchange rate has been basically stable for the following 10 years. The government's policy objective in this stage was to maintain the stability of the RMB exchange rate, so as to provide a relatively healthy and sustainable domestic and overseas development environment. Therefore, the International Monetary Fund divided the RMB exchange rate system in the period to from the original "managed floating system" to the "fixed pegging system to the US dollar".[127]

d. China’s implementation of basket-pegged managed floating system since 2005

With the continuous increase of the double surplus of China's current accounts and capital accounts, China's disequilibrium of balance of payments has aggravated, which has brought great appreciation pressure to the RMB. To cope with the balance of international payment and adapt to the domestic and international environment under the new situation, the Chinese government further reformed the RMB exchange rate system in July 2005, and announced to abandon the single pegging to the US dollar and adopt the exchange rate policy of pegging a basket of currencies. Meanwhile, China would further expand the average daily floating range of the RMB, and endow the currencies of the major trading partner countries with corresponding weight based on market supply and demand and according to the relationship between China and its major trading partners. Furthermore, the RMB multilateral exchange rate index would be calculated by referring to a basket of currencies, and based on this; the RMB exchange rate would be managed and adjusted, so

that the RMB exchange rate can float within a more reasonable range.

5.2.2.2 The change of exchange rate of RMB against US dollar

Table 7：Effective Exchange Rate of US Dollar against RMB

Time	Effective Exchange Rate of US Dollar against RMB
2000	8.2784
2001	8.277
2002	8.277
2003	8.277
2004	8.2768
2005	8.1917
2006	7.9718
2007	7.604
2008	6.9451
2009	6.831
2010	6.7695
2011	6.4588
2012	6.3125
2013	6.1932
2014	6.1428
2015	6.2284

2016	6.6423
2017	6.7518
2018	6.6174

Source: China Statistical Yearbook [128]

As shown in the table above, since the Chinese government implemented the exchange rate system of pegging a basket of currencies in July 2005, the exchange rate of RMB against US dollar slowly rose from approximately 8.1917 to 6.6174 in 2018 and increased by about 19%, and the trade surplus of China to the US continued to increase. The continuous depreciation of RMB did reverse the current situation of Sino-US trade imbalance, and the US still accumulates huge trade deficit every year. According to the data released by the National Bureau of Statistics of China, China's trade surplus to the US in 2005 was $114.17 billion, while the figure in 2018 was $323.32 billion. Thus it can be seen that China's trade surplus to the US did not decrease with the appreciation of the RMB. On the contrary, after the reform of China's exchange rate, the RMB entered the appreciation stage, and the trade surplus of China to the US has been continuously enlarged.

The RMB exchange rate is one of the influencing factors of Sino-US trade imbalance, but it is not the fundamental one. The restriction on RMB appreciation by political means within a short time only exerted an impact on the import and export trade in the short run, but did not change the base for the Sino-US trade. Based on the economic strength of the two countries and the industrial division in different stages, the present Sino-US trade imbalance in international trade will not change fundamentally because of exchange rate fluctuation.

5.3 A STATISTICAL ANALYSIS OF THE MACROECONOMIC FACTORS OF SINO-US TRADE IMBALANCE

5.3.1 Statistical methods for the macroeconomic factors of Sino-US trade imbalance

5.3.1.1 Data selection

In this dissertation, the data of China's surplus volume to the US (denoted as SC), the effective exchange rate of RMB against US dollar (denoted as R) and the difference in the national saving ratio between China and the US(denoted as QC) in Sino-US trade from 2000 to 2018 were selected. The multiple linear regression models were used to obtain the relationship among SC, R and QC, and further empirically analyze whether the decrease of QC and the appreciation of RMB can reduce SC.

The data of SC and R were from China Statistical Yearbook (2000-2018); the data of the national saving ratios of China and the US were from the Federal Reserve Date Base, and the QC was calculated indirectly.

Table 8：The Data of SC, R and QC

YEAR	SC	R	QC	The US QC	China’s QC	LNSC	LNR	LNQC
2000	297.3	8.2784	18.28	20.2	38.50	5.694742	2.11365	2.905534
2001	280.8	8.277	19.49	18.9	38.39	5.637659	2.113481	2.969902

2002	427.2	8.277	21.58	17.9	39.43	6.057263	2.113481	3.071767
2003	586.1	8.277	25.26	17.3	42.51	6.373539	2.113481	3.229222
2004	802.7	8.2768	27.51	17.8	45.26	6.68797	2.113456	3.31455
2005	1141.7	8.1917	28.13	18.3	46.38	7.040302	2.103121	3.336837
2006	1442.6	7.9718	29.57	18.6	48.14	7.274226	2.07591	3.386591
2007	1633.3	7.604	32.94	16.9	49.86	7.398329	2.028674	3.494536
2008	1708.6	6.9451	35.96	14.8	50.78	7.443412	1.938036	3.582268
2009	1433.7	6.831	36.63	14.0	50.63	7.268031	1.921471	3.600868
2010	1812.7	6.7695	36.24	15.6	51.79	7.502551	1.912427	3.590163
2011	2023.4	6.4588	33.03	16.8	49.80	7.612528	1.865444	3.497265
2012	2189.1	6.3125	31.42	18.3	49.69	7.691245	1.842532	3.447285
2013	2158.5	6.1932	29.87	18.9	48.79	7.677175	1.823452	3.396687
2014	2370.5	6.1428	29.46	20.0	49.41	7.77084	1.815281	3.383033
2015	2608.0	6.2284	28.35	19.4	47.70	7.866345	1.829119	3.344627
2016	2506.8	6.6423	27.73	18.2	45.88	7.826772	1.893458	3.322515
2017	2758.1	6.7518	27.88	18.3	46.20	7.922303	1.909809	3.32773
2018	3233.3	6.6174	27.17	18.1	45.29	8.081249	1.889703	3.301929

5.3.1.2 Analysis indexes

In Sino-US trade, China's surplus volume to the US is denoted as SC, the effective exchange rate of RMB against US dollar is denoted as R, and the difference in the national saving ratio between China and the US is denoted as QC.

5.3.1.3 Modeling

To eliminate the possible influence of heteroscedasticity, the natural logarithms of the above variables were calculated to respectively get LNSC, LNR and LNQC. Based on this, the influence factor model of Sino-US trade imbalance obtained is as follows：

$$LNSC = \beta_0 + \beta_1 LNR + \beta_2 LNQC + \varepsilon$$

Where β_0 is a constant term, β_1 is the influence coefficient of the exchange rate on China's surplus to the US, β_2 is the influence coefficient of the difference in the national saving ratio between China and the US on China's surplus to the US, and ε is the residual term. Next, this paper will use the 2000-2018 sample data of various variables to analyze the influence of exchange rate and the difference in the national saving ratio between China and the US on China's surplus to the US.

5.3.2 Descriptive statistics

Descriptive statistical analyses are conducted on China's surplus to the US, the exchange rate and the difference in the national saving ratio between China and the US from 2000 and 2018, and the trend charts are drawn respectively. The results obtained are as follows:

Table 9：Descriptive statistics

	N	Mean	Maximum	Minimum	Std. Dev.
SC	19	1653.39	3233.27	280.80	882.60
R	19	7.21	8.28	6.14	0.86
QC	19	28.76	36.63	18.28	5.17

Figure 5：The Trend of SC

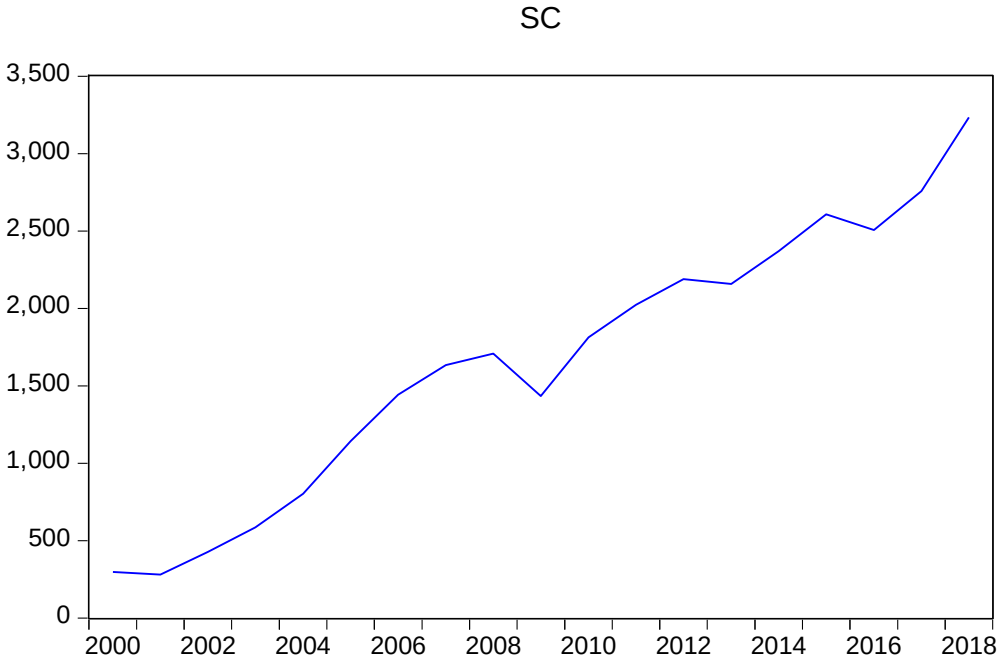


Figure 6：The Trend of Exchange Rate

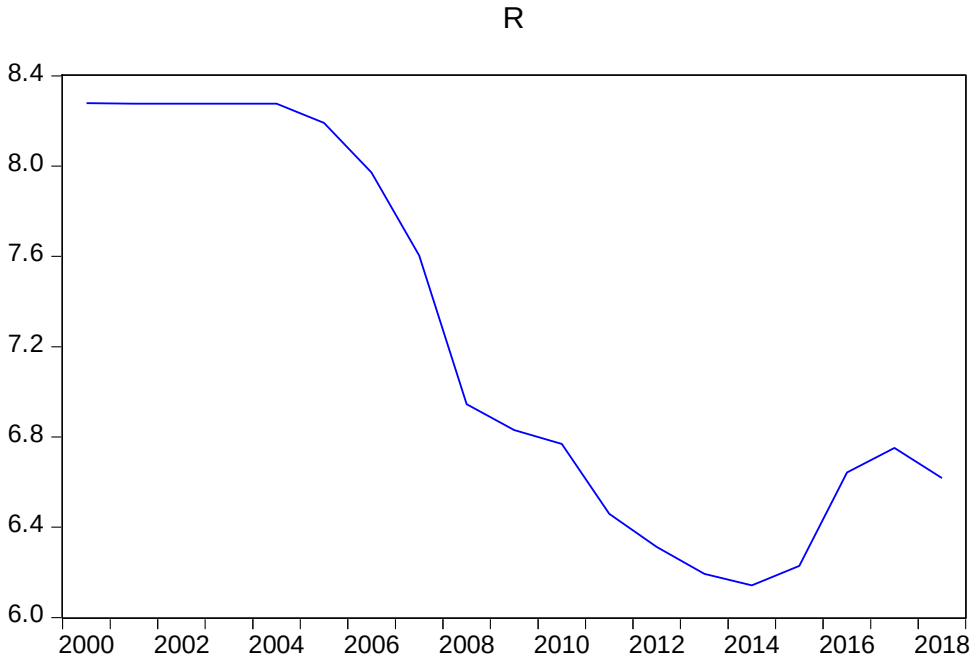
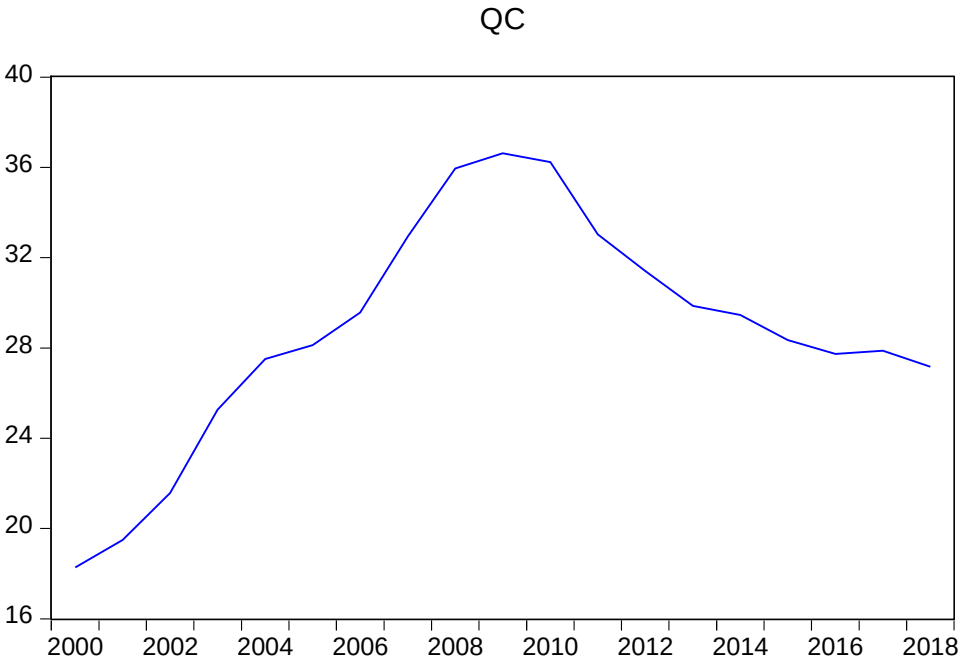


Figure 7：The Trend of QC



According to the above statistical table and trend charts, the trade surplus of China to the US from 2000 to 2018 was continuously enlarged, and the fluctuation was large, from $29.73 billion in 2000 to $32.33 billion in 2018; the effective exchange rate roughly presented a downtrend, the RMB appreciated to some extent, and the RMB appreciation level reached the peak in 2014. Besides, the difference in the national saving ratio between China and the US also presented an inverted V-shaped feature over time; it showed a continuously increasing trend from 2000 to 2009 and then gradually decreased from 2010 to 2018.

5.3.3 Stationary test

Since the data used in this paper was time series data, to avoid spurious regression, the stability of each variable needs to be judged at first. By using EVIEWS and the commonly used ADF unit root test, the stability of LNSC, LNR and LNQC was tested. The results were summarized as follows:

Table 10：Stationary Test Results of Variables

Variables	ADF Statistics	P Value	1% Critical Value	5% Critical Value	10% Critical Value	Conclusion
LNSC	-1.353342	0.8392	-4.571559	-3.690814	-3.286909	Non-stationary
LNR	-0.534767	0.9706	-4.571559	-3.690814	-3.286909	Non-stationary
LNQC	-1.940899	0.5874	-4.667883	-3.733200	-3.310349	Non-stationary
ΔLNSC	-1.974949	0.2935	-3.920350	-3.065585	-2.673459	Non-stationary
ΔLNR	-2.257401	0.1953	-3.886751	-3.052169	-2.666593	Non-stationary
ΔLNQC	-1.407711	0.5538	-3.886751	-3.052169	-2.666593	Non-stationary
ΔΔLNSC	-7.040349	0.0000	-2.717511	-1.964418	-1.605603	Stationary
ΔΔLNR	-4.134039	0.0004	-2.717511	-1.964418	-1.605603	Stationary
ΔΔLNQC	-3.699487	0.0011	-2.717511	-1.964418	-1.605603	Stationary

The analysis of the above test results shows that, suppose LNSC has a unit root, the P value of the test is 0.8392 and greater than 0.05, so the null hypothesis accepted. This indicates that LNSC has a unit root and is non-stationary; similarly, LNR and LNQC also have a unit root and are non-stationary. Then their first difference sequences ΔLNSC, ΔLNR and ΔLNQC are tested and the results show that the corresponding P values are still greater than 0.05, so the three first difference sequences are non-stationary. The results of their second difference sequences ΔΔLNSC, ΔΔLNR and ΔΔLNQC show that, the corresponding P values are lower than 0.05, so the hypothesis that the second difference sequences have no unit root in the confidence level of 5% can be rejected. This suggests that all the above second difference sequences have no unit root and are stationary.

Because LNSC, LNR, LNQC and their first difference sequences are all non-stationary, while their second difference sequences are stationary, the three variables are all

second-order single integrated time series and belong to the case of single integration in the same order. Next, the co-integration test is conducted.

5.3.4 Co-integration test

The co-integration test on LNSC, LNR and LNQC is carried out by using EG two-step method. The idea is to first carry out regression analysis on the model, and then conduct ADF unit root test on the regression residual. If the residual is stationary, then there is a co-integration relationship between the variables, and the estimated results of the model are reliable.

Firstly, by using the EVIEWS software and the least square method, a regression analysis of the model is conducted, and the estimated results are as follows:

Table 11：Estimated Results of Model Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNR	-3.944094	0.863097	-4.569700	0.0003
LNQC	1.525821	0.527994	2.889842	0.0107
C	9.868632	3.075472	3.208819	0.0055
R-squared		0.805707		
Adjusted R-squared		0.781421		
F-statistic		33.17498		
Probe(F-statistic)		0.000002		

It can be observed from the above table that the R-square estimated by the model is 0.805707, and the goodness of fit is relatively high; the corresponding P-value of F statistic is 0.000002 and less than 0.05, indicating that the linear relationship between LNSC and

LNR and LNQC is significant. Therefore, the regression results of the model are ideal.

Then ADF unit root test is conducted on the residual obtained above. The results are as follows:

Table 12：Stationary Test Results of the Residual

Variables	ADF statistic	P value	1% Critical Value	5% Critical Value	10% Critical Value	Conclusion
Residual	-2.711161	0.0099	-2.708094	-1.962813	-1.606129	Stationary

It can be seen that the P value is 0.0099 and less than 0.05, so the null hypothesis can be rejected at the confidence level of 5%. This indicates that the residual has no unit root and is stationary. Therefore, there is a long-term co-integration relationship between LNSC and LNR and LNQC, and the development trend is stable. The relation equation between the variables is obtained as below：

LNSC=9.868632-3.944094*LNR+1.525821*LNQC

The regression results show that, the P values of the significance test on the estimated coefficients of LNR and LNQC are 0.0003 and 0.0107, respectively, and less than 0.05, so the estimated coefficients passed the significance test. Hence, the exchange rate and the difference in the national saving ratio between China and the US have a significant impact on the trade surplus of China to the US. The exchange rate exerts a negative impact on the trade surplus, and the difference in the national saving ratio between China and the US exerts a positive impact on the trade surplus.

5.3.5 Analysis of results

According to the analysis of the above results, there is a long-term co-integration relationship between the trade surplus of China to the US and the exchange rate and the difference in the national saving ratio between China and the US, with a stable development trend. Specifically, the effective exchange rate of RMB against US dollar exerts a significantly negative impact on the trade surplus of China to the US. This shows that the trade surplus did not decline with the relative appreciation of RMB, and the scale of Sino-US trade imbalance is quickly expanding. The difference in the national saving ratio between China and the US exerts a significantly positive impact on the trade surplus of China to the US, that is, the greater the difference in the national saving ratio is, and the larger the trade surplus will be.

5.4 THE STRUCTURAL FACTORS OF THE TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

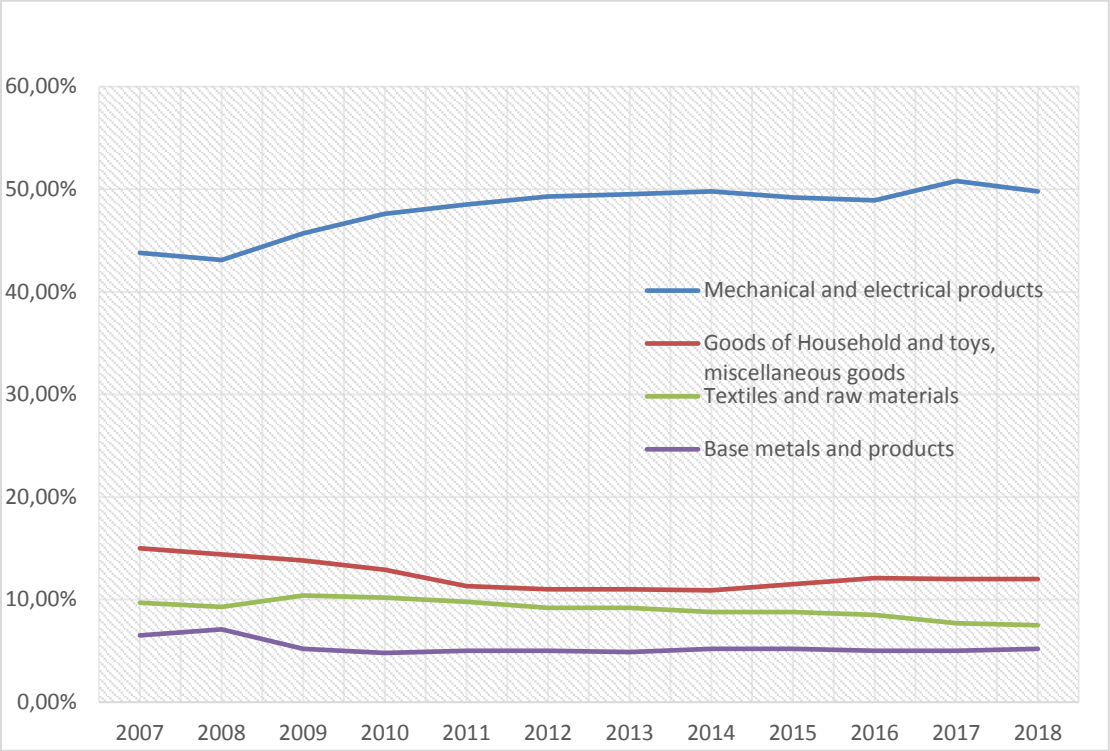
The factor endowment structure of the two countries determines the division of labor and trade structure of the two countries. This is the conclusion of trade theory. As is well-known, the fundamental realities of Chinese and the United States are that: China is the world's largest developing country, the United States is the largest developed country, compared to the rest of the world, the United States has entered a "post industrial society", with abundant capital and technology, but the labor cost is very high, traditional labor-intensive and resource-intensive manufacturing are transferring to Latin America and Asia, so the demand for daily necessities of the citizen of the United States only can rely on massive import; On the other hand, China's comparative advantage lies in the low price of labor and land, but relatively lack of capital and technology . According to the resource

endowment, China should export labor and resource-intensive products to the United States, while the United States should export capital and technology-intensive products to China.

5.4.1The structure of goods traded between China and the United States

China's exports to the United States are mainly mechanical and electrical products. Household appliances, toys, textiles, base metals and the products are also major components of China's exports to the United States. It can be seen from the following figure below that from 2007 to 2018, the export of mechanical and electrical products has always accounted for the largest proportion of China's total exports to the United States, with an average value of 48.1%, and the overall trend of slow increase. China's second largest export to the United States was home toys, with an average share of 12.1%.Exports of textiles and raw materials accounted for an average of 9.1% of total exports in China and the United States. Exports of base metals and products accounted for an average share of 5.4%.

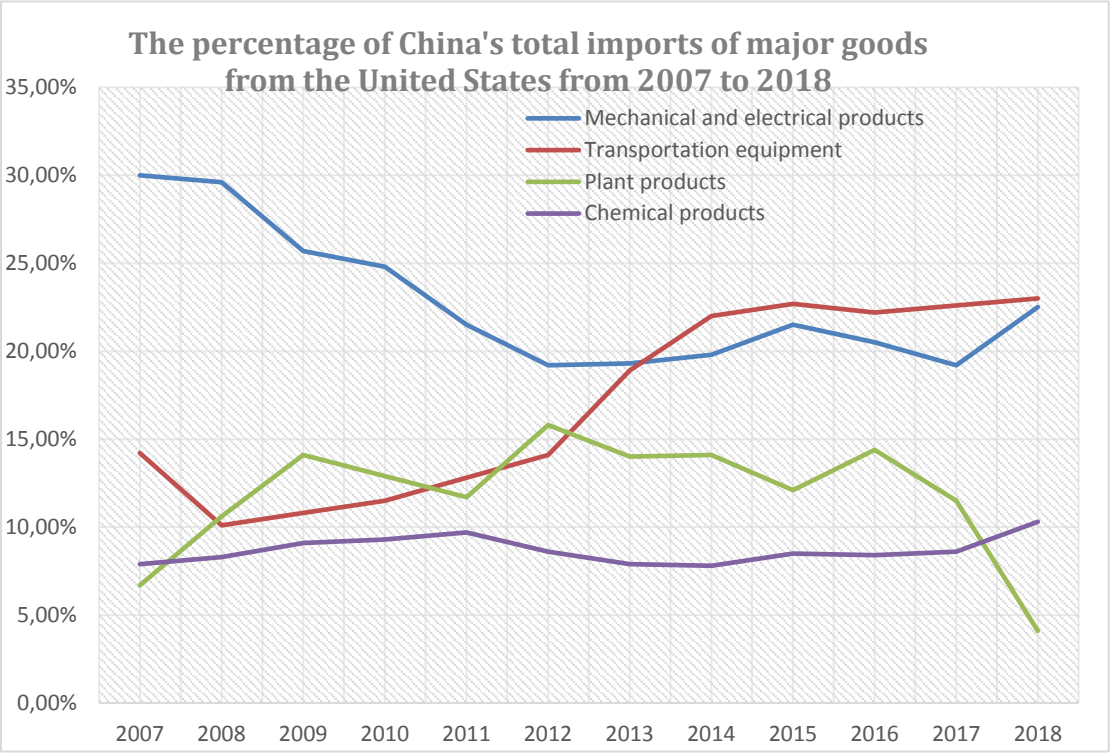
Figure 8: China's exports of major commodities to the United States as a percentage of China's total exports to the United States from 2007 to 2018



Source: According to the national report of the Ministry of Commerce of China

Mechanical and electrical products, transportation equipment, plant products and chemical products are China's main imports from the United States. The figure shows the percentage of China's total imports of major commodities from the United States from 2007 to 2018. Among them, the average proportion of mechanical and electrical products is 2.8%, the average proportion of transportation equipment is 17.1%, the average proportion of plant products is 11.8%, and the average proportion of chemical products is 8.7%.

Figure 9: The percentage of China's total imports of major goods from the United States from 2007 to 2018



Source: According to the national report of the Ministry of Commerce of China [129]

As can be seen from the Upper figure, from 2007 to 2018, China's mechanical and electrical products purchased from the United States showed a trend of decreasing first and then increasing, the import of transportation equipment decreased first and then increased, plant products fluctuated continuously, and the import of chemical products changed relatively small.

From the perspective of the structural characteristics of the goods traded between China and the United States, from 2007 to 2018, technology and capital-intensive products HS84-85 (mechanical and electrical products) were the main products exported from China to the United States, accounting for an average of 48.1%.The proportion of mechanical and electrical products in China's imports from the United States is only 22.8% on average, showing a significant trend of decline. It reflects the structural imbalance in goods traded between China and the United States.

According to the factor endowment theory of Huckster-Ohlin, under the premise of free trade, the trade of goods among countries is determined by their relative factor endowment, and countries or regions participating in international trade tend to produce and export their relatively abundant and import their relatively scarce factor intensive commodities. Therefore, based on the premise of free trade and different factor endowments, economic development and technological level between China and the United States, China should make use of its comparative advantage of low cost of labor, land and other resources to produce and export traditional labor-intensive products, while the United States should produce and export capital or technology-intensive products. But in fact, according to the above data of actual trade statistics, the result is not so. Here are the reasons:

Firstly, while the United States is free to import China's labor-intensive products, the United States has placed many restrictions on its domestic enterprises' export of technology-intensive products to China, which has led to a decline in its export to China and contributed to the trade imbalance between China and the United States. Secondly, due to the huge gap in the level of economic development between China and the United States, the demand structure of the residents of the two countries is also greatly different. People’s consumption choices are closely related to their income level. When the income level is very low, most of people's expenditure will be concentrated on necessities, such as food. When people's income level is relatively high, in addition to necessities, they can also buy high-end products to improve their welfare level. The reality is that most of the labor-intensive goods made in China are necessities of life, while the high-tech products made in the United States are high-end products. As we all know, people have to buy daily necessities regardless of their income level. As a result, the United States is bound to import a large number of labor-intensive products produced in China, resulting in a huge trade gap between the two countries. [130]

5.5 THE TRADE POLICY FACTORS OF THE TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

Considering the subjective factors that affect the trade imbalance between China and the United States, the trade policies adopted by China and the United States based on their own economic development, which speed up the trade imbalance between China and the United States and deepen the trade imbalance between China and the United States. In the absence of effective international economic rules and systems, the trade imbalance between China and the United States is a political and economic behavior aimed at the rapid development of their own economy and the maximization of their economic interests.

5.5.1 The foreign trade policy choice of the United States and trade imbalance between China and the United States

5.5.1.1 American policy on export control of high-tech products

The export control policy of the United States began in the 18th century, during the Second World War, national security concerns in the United States, the United States implements export controls of military and supplies to fascist states. After the Second World War, the United States adopted a policy of export control, economic sanctions and anti-dumping to the socialist camp headed by the Soviet Union.

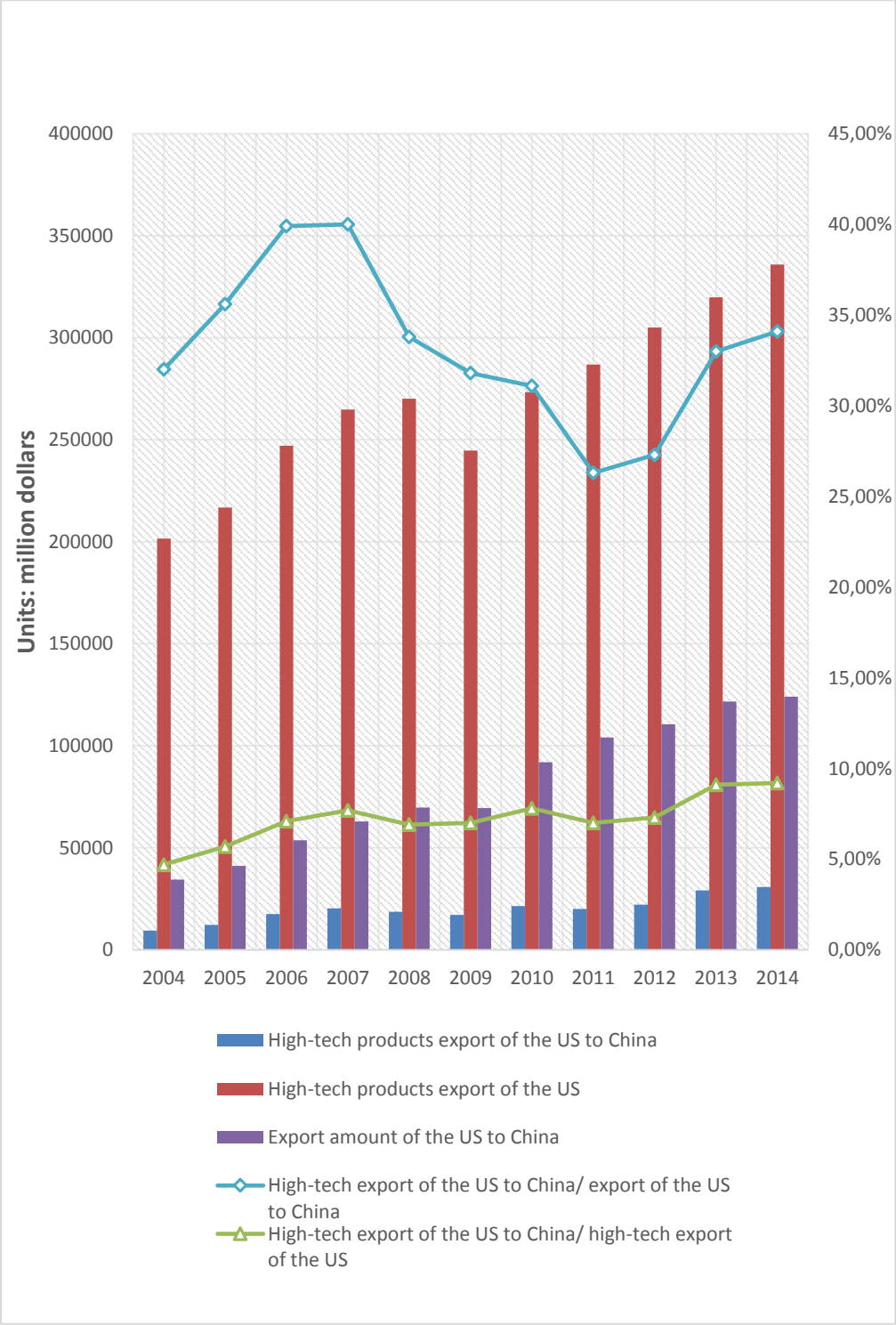
From the situation of export control of the United States to China, at the beginning of the founding of the People's Republic of China, the United States exercised comprehensive control over China's exports. After the second world war, the export administration act of

the United States department of commerce divided export control over foreign countries into seven levels, the most strict control is Z, then S, Y, W, Q, T, P and V in proper order. In the 1970s, the United States imposed a long-standing trade embargo and a total embargo on China, placing China in the Y category of export controls. In the 1980s, China and the United States eased their relations, and the two countries signed the Shanghai joint communique, which reduced the level of trade control of the United States against China to V level. After the 1990s, the rapid development of China made the United States strengthen the aware of the crisis, and the United States government began to block the preferential policies for technology export to China, and imposed export restrictions on the high-tech fields to China. On the choice of policy, the United States has always prioritized national security and political interests over economic interests, though China's growing trade surplus with America, for the sake of the overlord of the world economic status not be transcended and replaced, the United States control the export of high and new technology, which has absolutely advantages, to China, then willing to face the foreign trade deficit increased year by year.

The export of high-tech products from the United States to China can be divided into three levels. Firstly, green goods that do not threaten the US national security can be exported to China after being examined and approved by the US department of commerce; secondly, the yellow goods of dual-use technologies must be examined by the US department of defense before they can be exported. Thirdly, red commodities representing sensitive strategic technologies are strictly prohibited to China.

Figure 10: The High-tech products export of the US to China from 2004 to 2015

Units: million dollars,%



Source: Wind database [131]

As shown above, the US high-tech exports to China have been around 20 to 30%, which is still low compared with the proportion of the US high-tech industry in the economy. While

it is undeniably that China is the largest trading partner of the United States, but the most competitive high technology exports of the United States to China accounted for only 4.7% of the US high technology exports in 2004, although the proportion rises gradually, reached 10% by 2015,but that proportion is still small compared with China's demand for imports from the US high-tech industry and its ability to export, but fortunately, the proportion of high-tech exports from the United States to China has increased, indicating that the restrictions on high-tech exports from the United States to China are gradually easing.

From the foreign trade theory of comparative advantage analysis, the high-tech fields is comparative advantage industry of the foreign trade of the US, while the export restrictions of high-tech products at different levels imposed by the United States on most countries, especially on China, have caused the export of high-tech products that should belong to the United States to all countries in the world to be artificially greatly reduced, or through other countries detour. and the United States to most countries in different levels of high-tech products export restrictions, especially for China's more stringent high-tech product export restrictions, should belong to America's high-tech products exports to countries around the world, people have been greatly reduced, or through a detour to other countries. When the United States imports a large number of labor-intensive products from China and other developing countries, as well as oil resources from oil exporters, the division of labor among international industries is broken, which inevitably leads to the trade deficit of the United States and the trade surplus of China. The policy choice of the United States is an important factor causing the current trade imbalance between China and the United States.

5.5.1.2 Interest groups and the U.S. export control policies for high-tech products

Interest groups are important forces in the political and economic pattern of the United States. Although they are not in the center of power, they can influence foreign trade policy

by exerting pressure on congress, the government, the President and relevant agencies.

“The US is the country where interest groups flourish most”, as early as during the American Revolution, a group of agitators for American independence had arose. In the 1880s and 1890s, as industrialization accelerated, the number of American enterprise associations exploded. The 1920s were a golden age for interest groups, and influential organizations such as the American chamber of commerce, the national association of manufacturers, the American medical association, the national association for the advancement of colored people, the urban league, the American association for the advancement of agriculture, the American federation of agriculture, and the American Jewish committee were founded during this period. Since the 1960s and 1970s, under the background of accelerated economic globalization and the passing of the most intense period of the "cold war", American interest groups have ushered in another period of great development. In 1993, the number of interest groups increased by 50% compared with that of 1980 to about 23,000, five times that of 1955. [132]

Every major issue in the Sino-US trade relationship is a bone of contention among American interest groups, who engage in much public relations and lobbying to defend their interests. For example, export control has always been a very important issue in Sino-US trade relations. There are two kinds of opinions in the United States that support and oppose export control. Especially since the end of the "cold war", there have been fierce debates among different factions on the reform of export control system; they are divided into "national security" and "economic security". "National security" believes that it is necessary to put the national security in the core position, it will undermine the US security if export the cutting-edge technology to the countries that may be hostile to the United States, if sell technology to the unstable regime, these techniques can be used to against the United States or its Allies in the future, the relaxation of export controls for short-term commercial gain must not bring disaster to national security. "Economic security" argues that although some equipment and technology exports may be harmful to

the national security and foreign policy, but the current is too strict export control measures in the United States economy declining competitiveness, losing market share and created by export overseas jobs, some of the key industries of the U.S. will be suffered, therefore, to relax export, strengthen the economic security, is to defend national security.

The US business circles are supporters of the economic security theory. Their criticism of the US export control policy towards China mainly focuses on the following aspects:(1)The broad range of regulated products harms American businesses by limiting the export of many products or technologies that have no military application value.(2)Unclear regulatory rules and uncertain approval process have made many Chinese companies afraid to do business with the US companies, increased the uncertainty of the normal Sino-US trading environment.(3)Fail to take full account of the foreign availability of American technology that makes American companies lost the Chinese market.(4)The overly conservative export control policies of the United States limit the further development of American multinationals in China, which may cause American companies to lose their competitive advantage.(5)The Current US export control policies are damaging the US industrial base and will ultimately undermine the US national security interests.

Therefore, the business community actively promotes the liberalization of the US government's export control to China, and its efforts effectively balanced the political influence of the "national security faction". In 2000, the Rand corporation proposed to the President that America's substantial export control interests be promoted in an open manner, rather than being unstoppable or uncontrollable. In May 2005, the American chamber of commerce in China organized representatives from Beijing and Shanghai to attend a Washington government meeting to jointly appeal to 43 influential officials on China policy for timely updating of unnecessary export restrictions.

American foreign trade policy has a fairly perfect decision-making system, and interest

groups play an important role in the decision-making and implementation of foreign trade policy. The interest groups that play an important role in the decision-making and implementation of China's trade policy are mainly industrial and commercial interest groups, labor organizations and ideological interest groups. With the deepening development of Sino-US economic and trade relations, the interest groups concerned with China issues are becoming diversified. They carry out lobbying, activities, political donations, elections and public opinion making according to their own positions, and strive to realize their own interests and those of their members. The complexity of china-related interest groups determines that the U.S. trade policy towards China is periodic and volatile.

5.5.2 The choice of China's foreign trade policy and trade imbalance between China and the US

5.5.2.1 China's import substitution and export oriented foreign trade policy

During the founding of the People's Republic of China and the implementation of the reform and opening-up policy in 1978, China was in a relatively closed stage of self-development. After the reform and opening up, China implemented import substitution and export-oriented foreign trade policies to promote the development of domestic economy and the increase of foreign exports.

From the perspective of the policy tool of import substitution policy, in the early 1980s, China implemented high tariffs and an import quota and license system to guarantee China's foreign exchange reserves by restricting imports. Since the 1990s, with the implementation of export-oriented policies and the increase in the scale of foreign exports, the types of commodities subject to import license administration in China have been continuously reduced. Since the beginning of the 21st century, China has lifted the import

restrictions imposed by license.

From the policy tools of export-oriented policies, there are mainly export subsidies, export rebates and export credits. Because at the beginning of the reform and opening up, Chinese enterprises export competitiveness is weak, some export enterprises are in the red, in order to improve the production technology of domestic enterprises and the management ability, lead enterprises to learn from enterprises in developed countries and enterprises with strong competitive strength, China's national finance subsidizes trade losses, which played an important role in the early stage of China's foreign trade. At the same time, the product tax, value added tax and consumption tax paid by export enterprises shall be subject to tax refund administration to reduce the tax burden on export enterprises, guide domestic enterprises to develop export business and participate in international competition. Later in the 1990 s, China's export situation takes a turn for better, in order to make enterprises realize self-sustaining, China reduced and eventually eliminated the export subsidy policy to foreign trade enterprises, the export tax rebate rate cuts, although the export tax rebates repeatedly after Asian financial crisis in 1997 and the subprime crisis in 2008, the overall trend is that the export-oriented policy gradually weakening.

From the perspective of China's own situation, the choice of import substitution and export-oriented policy is based on its own interests and economic development situation. First of all, China's import substitution and export oriented policies are the result of foreign experience. From the 1950s to 1980s, Japan had transferred import substitution model to the implementation of export-oriented model, and realized the rapid development of economy, then, the four Asian tigers also followed the experience of Japan, expanded the scale of export, become a moderately developed country (region), export-oriented policy succeeded in many Asian countries (regions), turn into the templates and reference to China's development. Secondly, China's import substitution and export oriented policy are the direct choice to solve the problem of foreign exchange shortage. In the early days of reform and opening up, China's foreign exchange reserves were relatively small. Before

1980, China's foreign exchange reserves were less than 1 billion US dollars at most. In 1980, China's foreign exchange reserves were -1.3 billion US dollars, the serious shortage of foreign exchange reserves poses a threat to national security. At that time, due to the outbreak of Latin American debt crisis caused by excessive external debt, China learned from the experience and lessons of Latin American countries and made increasing foreign exchange reserves an important goal at that time, export is the most direct way to increase foreign exchange reserves.

The implementation of China's export-oriented foreign trade policy plays an important role in the development of China's economy. Firstly, export-oriented policies have driven China's economic growth. Export-oriented policies strongly supported the growth of China's exports, and promoted the rapid development of other domestic sectors through the export sector, so that China's economy has achieved rapid development since the end of the war, and has undergone earth-shaking changes in just a few decades. Secondly, export-oriented policies have eased China's tight job market and insufficient consumption demand. At the situation of China's large population, backward economic development and insufficient consumer demand, the development of export enabled China's human resources and resource advantage to play, with foreign consumer demand pull the development of the supply side of the domestic industry, alleviated the employment difficult situation at the time, increased the residents' income, and boosted the growth of China's own spending power. Thirdly, export-oriented policies have increased China's foreign exchange reserves and prevented China from suffering a major financial crisis. With the expansion of exports, China's foreign exchange reserves gradually increased. In 1997, China's official foreign exchange reserves reached 139.89 billion US dollars, 837 times the level at the beginning of the reform and opening up in 1978. By the end of 2015, China's foreign exchange reserves reached 3330.36 billion US dollars, 23.8 times the level in 1997, accounting for 30.5% of the global total foreign exchange reserves. Because of its abundant foreign exchange reserves, China did not experience a major financial crisis during the Asian financial crisis in 1997 and the rapid development of international hot

money, thus creating a favorable external environment for China's economic and financial development. (China Statistical Yearbook)

In addition, under the export-oriented foreign trade policy, the rapid development of China's export will inevitably bring some negative effects on China. It is mainly reflected in the formation of China's relatively extensive economic growth mode, high dependence on foreign trade, slow development of domestic demand, especially consumer demand, serious energy consumption and environmental pollution, and low monetary policy independence.

5.5.2.2 China's foreign investment policy of encouraging export

In order to get capital, more high-quality technology and management level by foreign investment, China has implemented more preferential encouragement policies for foreign investment than for Chinese enterprises, such as foreign exchange loans borrowed from foreign Banks in China may be converted into Yuan, all local governments also provide very preferential policies in taxation, environmental protection and access to credit to attract foreign capital, because for local governments, foreign investment is a relatively low-cost way to boost local economic growth, at the same time, it also can maximize the political utility of the local government during its term of office. Also, because China's capital controls, the import substitution policy adopted by China to prevent payment crisis makes it difficult for domestic economic organizations and individuals to meet their import needs, because even if China had the money, the cost is high for local governments and it is difficult to realize. While the way of foreign investment not only avoids the problem of exchange, but also meets the import demand of foreign equipment.

At that time, when China was short of funds, technology and equipment, the encouraging policies of foreign investment led to the increase of China's export scale, the technological

level and management ability of Chinese enterprises were significantly improved, and the growth rate of China's economy was accelerated. But at the same time, there are also a large number of foreign exchange funds and the destruction of resources and environment.

The choice of national trade policies of China and the United States has an important influence on the direction and degree of the trade imbalance between China and the United States. However, both the export control policies of high-tech products of the United States and China's export-oriented policies are the policy choices based on their own interests such as economic interests and national security at that time, which are more beneficial than harmful to the country itself, but the effect of these policies on major trading partners is to promote imbalances in their trade and the global economy. Are policies that do more good for them than harm for the world economy as a whole? In the absence of international policy coordination mechanism, the global economic imbalance, in a sense, is the political and economic behavior of each country aiming at the rapid development of its own economy and the maximization of its economic interests, which objectively produces the synthetic fallacy of global economic development.

5.6 THE INTERNATIONAL INDUSTRIAL TRANSFER AND EAST ASIAN FACTORS OF THE TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

From the perspective of the development history of countries in the 20th century, the upgrading of global industrial structure is mainly a process in which the leading industries of individual developed countries are successively replaced and gradually transferred to overseas countries, thus making the industrial structure of countries in the world continuously move forward. Since the 1960s, there have been three summits of global industrial structure transfer. The first global industrial structure transfer was initiated in the

United States in the 1960s, Under the impetus of the technological revolution, the United States strive to develop the steel industry, chemical industry, automobile and other capital intensive industry, and develop some high value-added technology, capital intensive industry, such as robotics, electronics industry and aerospace industry, and transfer labor-intensive textile industry and part of heavy chemical industries with high energy consumption and pollution to the east Asian region. In the 1970s, the United States further adjusted its economic structure. It began to develop knowledge-intensive and technology-intensive industries with less consumption of resources and energy, mainly based on microelectronics technology, and transferred capital-intensive industries such as automobiles, steel and shipbuilding to newly industrialized countries to improve the level of industrial structure. At this time, newly industrialized countries began to undertake capital-intensive industries from developed countries such as the United States, and transferred labor-intensive industries that had lost their comparative advantages to developing countries such as ASEAN, so as to upgrade their industrial structures. The second adjustment of industrial structure has two characteristics: firstly, the regional division of labor between developed countries and developing countries develops in depth. The United States, Japan and other developed countries can promote the upgrading of industrial structure by transferring the focus of industrial structure to high-tech, informatization and servitization. On the one hand, they strive to develop the information industry centered on microelectronics technology and the high-tech industry centered on biotechnology, new materials and new energy, and transform the traditional industries with new and high technologies. On the other hand, they transfer traditional industries that have lost their comparative advantage and some low-value-added technology-intensive industries, including automobiles and electronics, to other countries, especially the FOUR Asian tigers and ASEAN. Since the middle of 1980s, the Four Asian tigers have begun fierce competition with the United States and Japan in iron, steel, automobile, petrochemical and other fields and have begun to absorb the high-tech and investment from the microelectronics of the United States and Japan, at the same time, At the same time, labor-intensive industries and some capital - and technology-intensive industries were transferred to ASEAN and China, which promoted the economic development and

industrial structure upgrading of these countries. Secondly, vertical division of labor between industries begun develop to vertical division of labor within industries The third world industrial structure shift occurred in the 1990 s, the United States, Japan and other developed countries shift from industrial economy to information economy, focus of the industrial structure adjustment is the development of high and new technology industry, especially the information technology industry, and they transferred those mature industries to developing countries, even the information industry was gradually transferred to developing countries. At this time, in the pattern of international division of labor, there appeared the new characteristics of deepening the development of "product differential division of labor" and "production process type division of labor". Overall, the United States is in the position of the top in the international division of labor, it is mainly engaged in the production of high value-added products, Japan and Western Europe and other developed countries, exert its advantages in the field of applied technology development, mainly engaged in the general high value-added products, the technical levels of other developing countries are low, so they mainly engaged in general industrial product production with lower value-added.

The emergence of international product division of labor and economic globalization have made the economic and trade relations among countries closer and more complex. Therefore, in the context of economic globalization, the study of the trade imbalance between China and the United States should not only consider the bilateral factors, but also consider the influence of other countries.

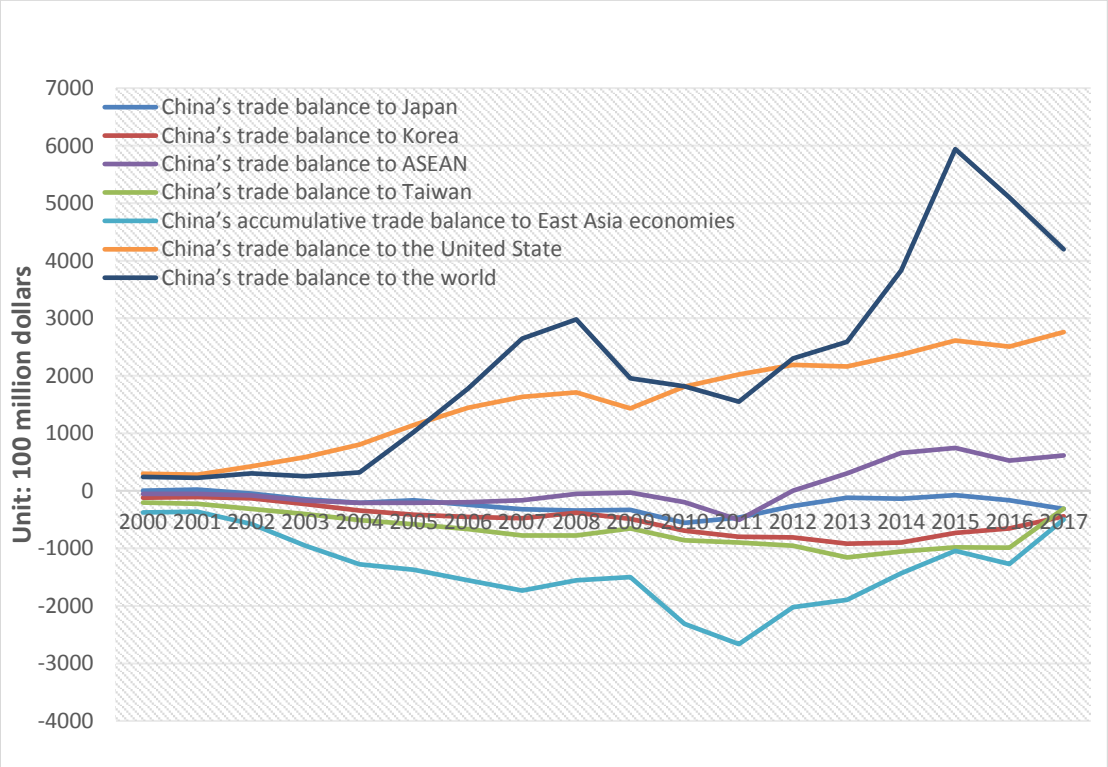
In my analysis of the trade structure between China and the United States, I found that China has an export advantage over the United States in Chinese technology and high-tech products, leading to a substantial increase in the trade surplus of these two types of products. In particular, the rapid increase of the trade surplus of high-tech products in recent years has played a crucial role in exacerbating the trade imbalance between the two countries. The above phenomenon cannot be reasonably explained from the traditional

theory of comparative advantage between the two countries. I tried to explain it from the perspective of global product division, and I gradually realizing that China's trade surplus transfer from a large part of East Asian economies to the United States is an important factor leading to the trade imbalance between China and the United States.

While China has a long-term trade surplus with the United States, it also has a long-term bilateral trade deficit with East Asian economies. There should be some correlation between China's trade surplus with the US and China's trade deficit with East Asian economies.

Figure 11: China’s trade balance with East Asian economies from 2000 to 2017

Unit: 100 million dollars



Source: statistics collected by the Ministry of Commerce of China [133]

The trend lines of China's trade balance with the United States and China's trade balance with East Asian economies are on the upper and lower sides of the coordinate axis respectively, showing certain symmetry and a "scissor-mouth" development trend.

While China has maintained a long-term pattern of unilateral trade surplus with the US since 2000, the bilateral trade between China and East Asian economies has also shown an obvious trend of persistent and huge deficits.

The symmetrically deviating trend of China's trade surplus with the United States and China's cumulative trade deficit with East Asian economies on both sides of the axis are getting faster and more obvious from 2000 to 2011. Among them, while China's cumulative trade deficit with East Asian economies reached a peak of 266.467 billion US dollars in 2011, the trade surplus with the US also raised rapidly to 202.32 billion us dollars. At this stage, Chinese trade surplus with China of east Asian economies trade deficit not only increases the same between the frontal and each year the balance of trade of absolute value also keeps close state, so that after the two offset each other, the overall surplus of China's foreign trade never appeared leap-type rapid growth within in this phase.

Since 2012, China's cumulative trade deficit with East Asian economies has shown a significant trend of decline, among which China's trade surplus with ASEAN countries even appeared for the first time and continued for six years. At the same time, although the overall trade surplus between China and the United States is still on the rise, the absolute value of China's trade surplus with the United States shows a trend of increasing and decreasing fluctuations and the increasing speed is obviously slowing down.

In terms of imports, China imports a lot from east Asia rather than from the United States for two reasons: firstly, the United States imposes export controls on the export of high-tech products to China, which results in a considerable number of products that China is willing to import cannot be imported. Secondly, Because China needs a large number of machinery and equipment and intermediate inputs for processing trade production, and various inputs used for processing trade in the United States and Japan have largely lost

their comparative advantage, China imports more from South Korea, Taiwan and ASEAN. From the point of export, on the one hand, many products exported by China are actually exported from other countries or regions in East Asia, but now they are transferred to China. On the other hand, from the perspective of market, the market size of other East Asian countries or regions is generally smaller than that of Europe and the United States, and compared with the European and the United States, these countries and regions have stricter restrictions on import products. Therefore, a large number of Chinese export products are mainly sold to Europe and the United States instead of East Asia. Thus, the trade imbalance between China and the United States is not a problem between China and the United States, but among China, the United States and other East Asian economies. It is also the result of industrial restructuring and transfer in East Asia. To some extent, the US trade deficit with China is the result of the US trade deficit with Japan, South Korea, ASEAN and other countries transferring to China, which is a kind of transfer deficit.

Therefore, in the context of economic globalization and international industrial transfer, it is not complete to examine the bilateral trade balance. While China has a large surplus with the US, its deficit with East Asia has risen.

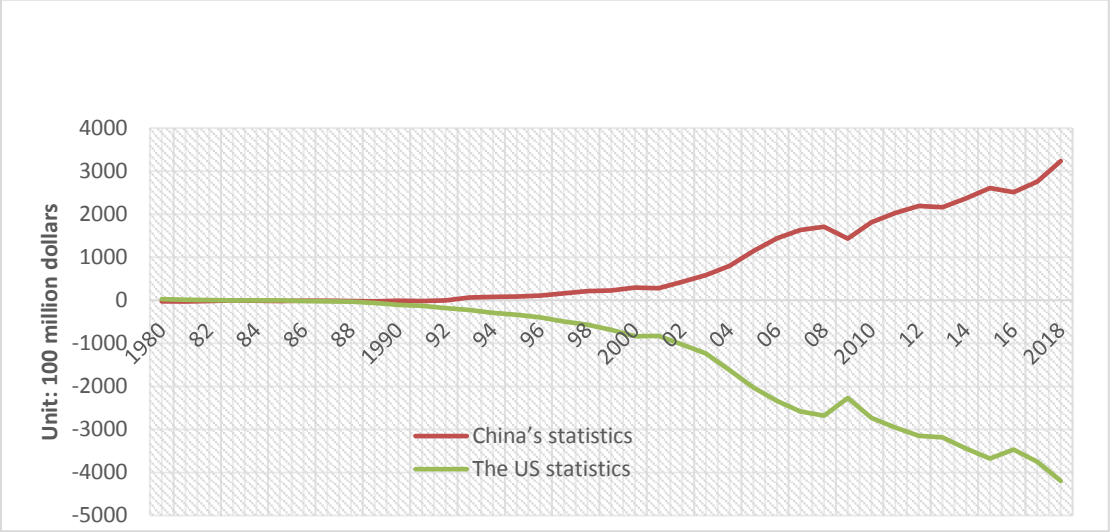
5.7 THE STATISTICAL DIFFERENCES OF THE TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

The trade statistics dispute between China and the United States has a long history; statistical discrepancy is one of the causes of bilateral trade imbalance. According to China's national bureau of statistics, the first time that China has run a trade surplus with the United States since issued the 1979 U.S.-China trade agreement was 6.27 billion dollars in 1993 and 275.8 billion dollars in 2017; According to the US department of commerce, the first US trade deficit with China was 320 million dollars in 1983 and

reached 375.2 billion dollars in 2017. It can be seen that the statistical differences between the two sides are quite different.

Figure 12: Comparison of trade balance data between China and the United States from 1980 to 2018

100 million dollars



Source: Chinese data comes from China Foreign Economic Statistics Yearbook [134] and China Commerce Yearbook [135], and US data comes from the website of the US Department of Commerce [136]

For a long time, there has been a gap between the US trade deficit with China and China's trade surplus with the US. The gap has widened as trade between the two countries has increased. As can be seen from the above Figure, the Chinese and American statistics have been inconsistent since the beginning of bilateral trade, and the two sides have different views on the year when the trade balance reversed. According to the US official data, the US ran its first trade deficit with China in 1983 and has continued to do so ever since. China's first surplus with the United States was in 1993. And with the expansion of bilateral trade, the statistical gap is getting bigger and bigger. In 1980, the gap between the two sides was only 260 million US dollars, while in 2013; the statistical gap reached 102.9 billion US dollars.

Such a huge gap has attracted the attention of many Chinese and foreign scholars. Through research, it is found that although both countries follow the common United Nations commodity trade statistical standards, the irrationality of the statistical standards and different understandings of the standards determined the differences in trade statistics between the two countries and artificially exaggerated the trade imbalance between China and the United States.

From the valuation, China adopts FOB for goods export statistics, the United States adopts FAS and CIF for goods import statistics. The value of goods imported from China to the United States on CIF basis includes the international freight and insurance costs incurred from China's ports to the United States; Chinese exports to the United States at FOB prices do not include these fees. Considering the huge volume of goods trade between China and the United States and China's trade surplus, this price difference will not be offset by imports and exports between the two sides, but will widen the statistical difference between imports of American goods and exports of Chinese goods.

From the perspective of entrepot trade and trade tariffs, the statistics of import and export of goods between China and the United States include the information of country of origin (region) and country of final destination (region). The origin of goods is taken as the basis of import statistics, and the destination of exports as the basis of export statistics. However, in statistical practice, if there is an entrepot trade, especially the entrepot trades passing through Hong Kong, China, Singapore and other places, the export destination informed by the Chinese side is usually registered as Hong Kong, China, Singapore and so on. But when the middlemen export goods to the United States again, the United States counts them as imports from Chinese mainland under the rules of origin. There are two kinds of markup in transit trade. One is typically for processing trade goods, which are bought by middlemen after they leave the Chinese border and then resold at higher prices to American buyers, adding to the price of Chinese exports to the United States. The other is the markup behavior that trans-ship to the United States through China Hong Kong. This is

due to the value added of the goods after they are processed more simply in Hong Kong, or to the increase in price as a result of the pursuit of profit. However, even if these goods are processed, the United States still considers them as part of the Chinese mainland's exports to the United States and counts the total value of imports of processed goods as long as the nature of the goods is not changed materially. This part of added value or increase in prices is not counted by China as exports of goods to the United States, but is counted by the United States as imports from China, which is another important factor in the statistical discrepancy between China and the United States in goods trade. The retailed data decomposition refers to Yang's study [137] on Hong Kong statistical data (2008). According to the Study on statistics differences between the goods trade of China and the United States issued by the ministry of commerce of China and the United States jointly, these two factors are major causes of goods trade statistics differences of China and the United States. The two markups above that occur in transit trade driven up the value of US imports from China and widen the statistical discrepancy, but the added value acquired by companies outside mainland China. In addition, there are also behaviors of tax avoidance of the exported goods of the United States to the mainland through Hong Kong, China, such as systematically lowered the total value of goods and changed the classification, resulting in China's total imports from the United States being further underestimated.

Statistics of service trade, before 2008, bilateral trade in services was basically flat. After 2008, the US trade surplus in services with China grew rapidly[138]，and China's contribution to the US trade surplus in services is increasing year by year. In 2017, the US trade surplus in services with China reached us $38.5 billion, accounting for 15.9 percent of the US trade surplus in services. That's nearly 12 percent more than in 2008[139]. The surplus of service trade between the United States and China is mainly manifested in the surplus of travel items. In the balance of payments, travel is the main source of China's service trade deficit. It's worth nothing that Chinese spending in the United States has been growing at a double-digit rate for years. Among them, the proportion of China's expenditure on education in the United States is high, and the growth is stable. In 2017,

Chinese residents spent $32.18 billion in the United States [139]. In addition, with the improvement of the living standard of Chinese residents in recent years, a large number of Chinese people travel to the United States. Many of the American goods bought during this period were sent back to China by mail or other means, and were not recorded in the form of goods imported into China [140].

As you see, services trade between China and the United States covered a lot of goods that are supposed to record in goods trade. The existence of these phenomena the volume of our imports of goods from the United States to a large extent underestimates. In addition, the service trade between China and the United States is not counted in total trade volume between China and the United States, the trade volume of China and the United States that counted by customs only contains bilateral goods trade volume. If the Sino-US trade in service is included in the total trade volume between China and the US, the US trade deficit with China will be significantly reduced.

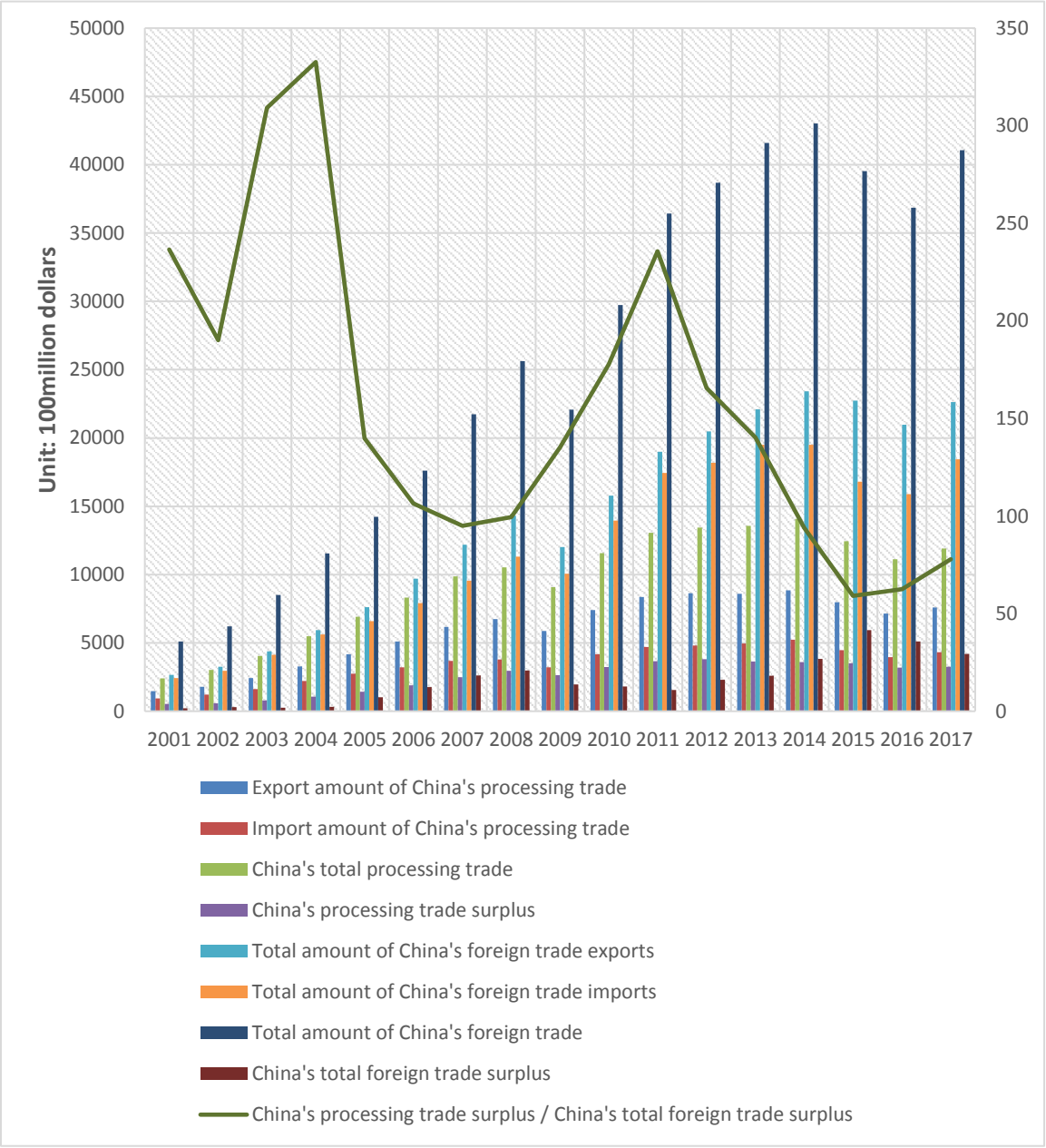
5.8 THE FACTORS OF THE TRADE PATTERN OF THE TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

Processing trade is the result of the adjustment of global industrial structure and a form of industrial transmission. With the further development of knowledge economy in the United States, a V-shaped production organization structure similar to the "smile curve" has gradually formed, that is, Japan and South Korea engage in capital and technology-intensive production activities such as R&D and design, producing and exporting key parts; Asian and Taiwan produce and export parts system; China engages in labor-intensive assembly and supplies a small number of parts; Hong Kong mainly provides marketing services to overseas markets such as the United States and Europe; And the United States is an export market for products. With China becoming the world's

processing and manufacturing base, China has formed a trade structure dominated by processing trade on the whole. The raw materials and parts of processing trade mainly come from South Korea, Taiwan, Singapore and other Asian countries. Processed products are re-exported to the United States and European markets through Hong Kong. According to the statistics of the principle of origin, the exporting countries of processed products also transfer to China from these East Asian countries and regions.

Figure 13: Processing trade mode and the surplus ratio of China from 2001 to 2017

Unit: 100million dollars

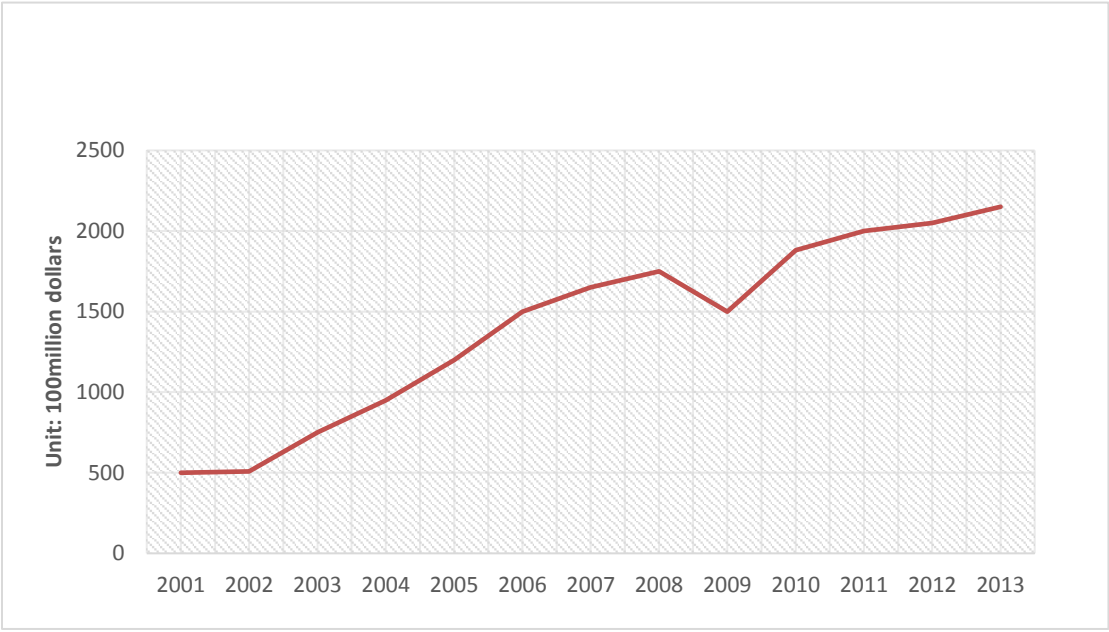


Source: China Customs statistical yearbook [141]

From the above Figure, we can find that first of all, from the perspective of the change in the growth volume, from 2001 to 2017, China's total import and export volume of processing trade increased from 241.4 billion US dollars to 11911.3 US dollars, with an average annual growth rate of 10.49% : the export volume increased from 147.43 billion US dollars to 758.83 billion US dollars, with an average annual growth rate of 10.78%; Imports increased from 93.97 billion US dollars to 432.3 billion US dollars, with an average annual growth rate of 10.01. From 2001 to 2017, China's processing trade surplus

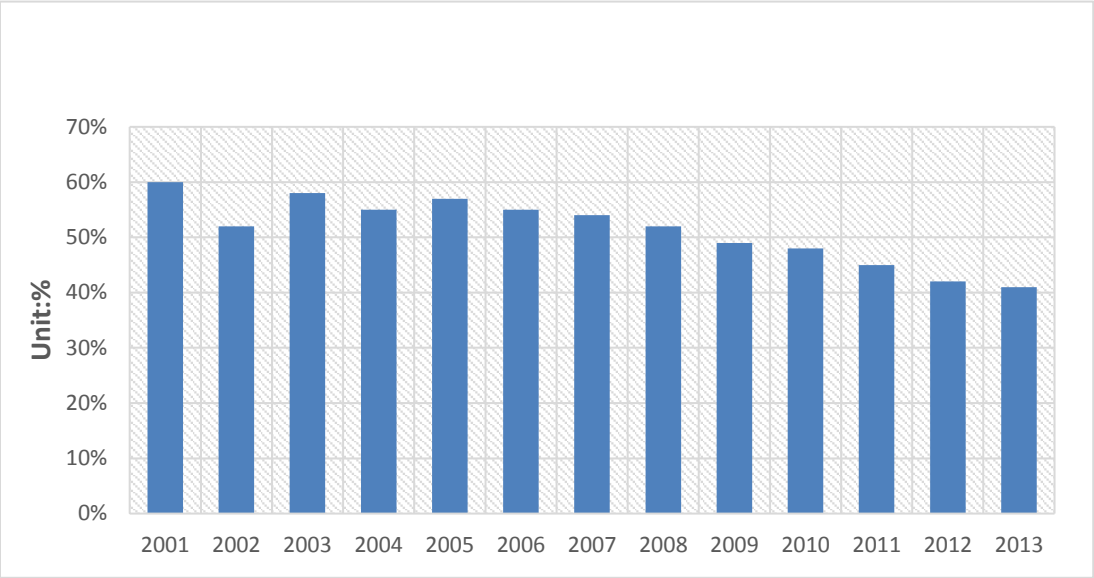
increased from 53.46 billion US dollars to 326.53 billion US dollars, with an average annual growth rate of 11.97%. Secondly, from the perspective of each year, from 2001 to 2017, China's processing trade surplus in 17 years accounted for the proportion of the overall trade surplus are over 50%, among them, there are three years of processing trade surplus accounted for nearly 100%, even in the processing trade surplus in 2004 the share is as high as 332.6%, which means that the year caused by way of processing trade in China's foreign trade surplus is more than three times the overall trade surplus. Although the share of processing trade surplus has declined with the expansion of general trade export growth since 2015, it still accounts for more than 50% of the total trade surplus. Therefore, we have sufficient evidence to believe that processing trade is the main source of China's foreign trade surplus.

Figure 14: Total amount of processing trade between China and the United States



Source: China customs database

Figure 15: The proportion of the amount of processing trade between China and the United States in the total amount of trade between China and the United States



Source: China customs database

In China's export trade with the United States, the proportion of trade pattern is seriously unbalanced, and the processing trade pattern has always been dominant.

The processing trade volume between China and the United States has been increasing year by year，as can be seen from the figure above, the import and export volume of processing trade rose from 502.4 US dollars in 2001 to 215.7 billion US dollars in 2013. Only in 2009, when the financial crisis was recovering, there was a small decline. However, in 2010, the processing trade returned to the level before crisis, but the growth rate declined year by year. The chart above shows that in 2001, processing trade between China and the United States accounted for 59 percent of the total trade between the two sides. By 2013, that share had dropped to 41 percent. According to Chinese customs statistics, from January to July 2014, China's import and export volume to the United States through processing trade reached 117.687 billion US dollars, accounting for 38.54% of China's total import and export volume to the United States in the same period. Imports and exports to the United States in general trade reached 152.639 billion US dollars, accounting for 49.993% of China's total imports and exports to the United States in the

same period. It can be seen from this that China's trade with the United States has gradually changed the trade mode dominated by processing trade. Traditional processing trade is shrinking, and general trade mode has maintained a good growth trend and become the main trade mode between China and the United States.

The United States, with its advanced production technology and sufficient capital elements, is at the highest end of the world's industrial chain. By contrast, China, with its abundant labor resources and vast market, lacks advanced technology and capital and is at the lower end of the world's industrial chain. As a result, China only gains a small amount of profit through processing trade, while the design, research and development link of real high profit is in the United States. Although processing trade solves the problems of employment and foreign exchange reserve in China, it is easy to cause resource waste and affect the adjustment of China's industrial structure in the long run. Therefore, China makes great efforts to develop general trade by means of export tax rebates, changes the dominant pattern of processing trade and gradually changes the imbalance of trade pattern.

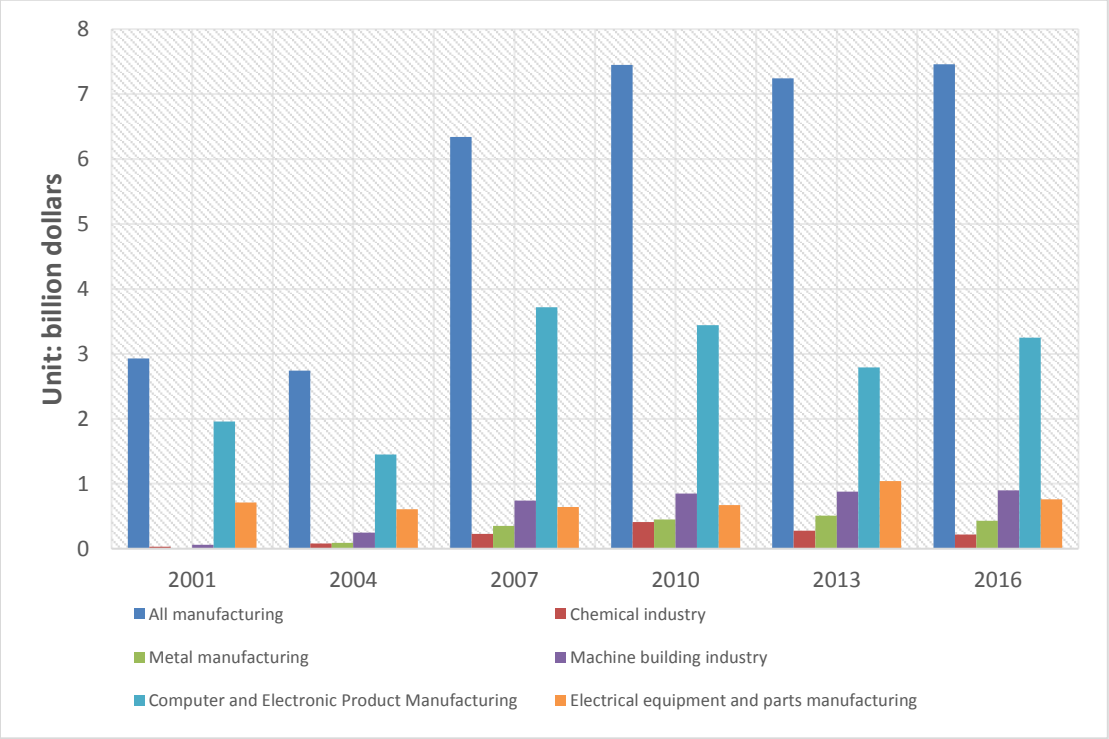
5.9 DIRECT INVESTMENT FACTORS OF THE UNITED STATES IN CHINA OF TRADE IMBALANCE BETWEEN CHINA AND THE UNITED STATES

In the international division of labor, transnational corporations from developed countries invest and set up factories for production and processing in developing countries with cheap labor or abundant resources through foreign direct investment, and then export the products back to their home countries or other countries and regions. The direct investment of transnational corporation objectively promotes the increase of commodity export of host country and produces the effect of trade creation.

The trade creation effect of FDI mainly occurs in the international vertical division of labor. It is generally believed that in the process of economic globalization, a country carries out direct investment of vertical international division of labor and places different production links in multiple countries or regions to seek high profits brought by cost differences. The US direct investment in China produces products and sells intermediate or finished products back to the US or other countries and regions, which drives the growth of China's export and produces the trade creation effect of FDI.

Figure 16: The amount of products sold back to the United States by American enterprises with direct investment in China

Billion dollars



Source: US Bureau of Economic Analysis website [142]

As shown in the above figure, from 2001 to 2016, the amount of products of American direct investment enterprises in China sold back to the United States showed an overall growth trend, but the amount was far less than the sales of American direct investment enterprises in China. To some extent, this shows that American direct investment companies in China do not mainly take China as an overseas "manufacturing plant" to sell

back to the United States, but more as a production-sales market, seeking to make more profits through trade barriers.

From the point of view of specific representative industries, from 2001 to 2016, the amount of products of the US direct investment enterprises in China sold back to the US gradually increased. In 2004, the total amount of back sales of chemical industry, metal manufacturing, machinery manufacturing, computer and electronic products manufacturing and electrical equipment and parts manufacturing were low, which were 0.8 billion US dollars, 0.9 billion US dollars, 250 million US dollars, 1.45 billion US dollars and 610 million US dollars respectively. In 2015, the amount of reselling in each representative industry has increased to 260 million US dollars, 650 million US dollars, 1.07 billion US dollars, 3.59 billion US dollars and 800 million US dollars, all of which have increased significantly. In 2016, with the influence of American multinational companies moving back to the United States and moving to developing countries and regions outside China, the amount of products sold back to the United States by American direct investment enterprises in China declined slightly.

It can be seen that from 2001 to 2016, influenced by the creation effect of the direct investment and trade between the US and China, the amount of products sold back to the US by its enterprises in China continued to increase, which greatly increased China's exports to the US. Affected by this effect, the US trade deficit with China further widened.

The US direct investment in China has not only increased US imports from China, but also reduced the exports to China. The business activities of US multinationals in China are not reflected in Sino-US trade statistics. American multinationals produce and sell products in China instead of China importing them from the United States. Most American investment enterprises in China are import substitution enterprises, which focus on the vast potential market of China. American multinational companies not only transfer a large number of goods and services to the enterprises in China, but also implement the principle of local

production and local sales in China, improving their competitive advantage in their products and market share in China, thus reduced China's imports of goods and services from the United States. In export statistics, the trade between the parent company of an American multinational corporation and its Chinese subsidiary is internal trade, but it is recorded in China's exports to the United States. The internal trade of American transnational corporations is an important part of the bilateral trade between China and the United States, and the proportion of the trade volume between China and the United States keeps increasing.

According to statistics from relevant departments, in 1993, the import volume of US multinationals from their subsidiaries in China is 3.311 billion US dollars, and the export volume is 508 million US dollars. The internal trade deficit is 2.803 billion us dollars, accounting for 14.5% of the surplus between China and the US in that year. It was more than 40% of the trade surplus in 2010.

Then, the investment projects and products of the United States multinational companies in China mostly has lost its monopoly advantage in the United States, and the technology has overflow abroad, American companies in China gain rich resources and cheap labor costs in China, the investment and production of the US enterprises in China lowered the production cost, improved the competitiveness of the products, which reduced the U.S. exports and imports from China.

Although US investment in China can promote China's import from the US, for example, US direct investment in China has driven the development of China's manufacturing industry, but it is restricted by China's resources, management and production level, forcing China to import corresponding raw materials, major parts, machinery and equipment, technologies and services from the US. However, the latter plays a more important role in china-US bilateral trade than the substitution effect and promoting effect of US direct investment in China.

The emergence of this result is mainly affected by economic globalization and global industrial transfer. At present, China is at the middle and low end of the global industrial chain and it is an important "export processing plant" in the world. As China continues to open wider to the outside world, middle and low-end manufacturing is gradually shifting to China. As the most developed country, the United States not only has a large number of powerful multinational companies, but also needs to eliminate or transfer backward sectors in the process of industrial optimization and upgrading; China is the best choice of the US direct investment. By investing factories in China, the United States combines its technological advantages with China's relatively cheap labor to produce and export goods to the world, from which it reaped huge profits. In the process, some of the domestic demand for US products is met by companies investing in China, which to some extent, increases the Sino-US trade imbalance. It can be seen that the US is not only the creator of the bilateral trade imbalance, but also the main beneficiary of Sino-US trade.

5.10 CORRELATION TEST OF FOREIGN DIRECT INVESTMENT IN CHINA AND SINO-US TRADE IMBALANCE

Trade and Foreign Direct Investment

A substitution relationship lies between trade and direct investment, which is reflected in the fact that the international capital flow originates from the obstacles in international trade, while international trade arises from the obstacles in capital flow. Mundell R. A., the first to study the substitution relationship between the two. Based on the analytical framework of trade theory H-0, he studied the substitution relationship between the international trade and FDI by means of standard model. Through research, Mundell R.A. (1957) found that if there are factors hindering free trade, such as international trade

barriers, and assuming that corporations can always make transnational investment along the track of Rybczynski line, such investment can make cost conversion with a relatively low factor or completely replace the transnational commodity trade in an efficiency way that is relatively optimum [143]. Such alternative theory well explains the international FDI phenomenon represented by American investment in Japan and Europe before the Second World War, but in the 1960s, the alternative theory of investment and trade encountered great challenges. Since the global economic integration develops, new vicissitudes have occurred in the relationship between trade and investment. Substitution is no longer an inevitable relationship between the two, and the relationship between investment and trade has shown obvious complementary or simulative relationships. Professor Kiyoshi Kojima from Hitotsubashi University in Japan put forward the theory that there is mutual promotion between trade and investment [144], so as to explain the new phenomenon. By studying aggregate data, industry data and enterprise data, Lipsey and Weiss found that the export volume of a country has a significantly positive correlation with the sales volume of the subsidiary of its multinational corporation, that is, international direct investment and international trade are complementary [145][146]. Based on empirical analysis, Blonigen demonstrated that there are both complementary and alternative relationships between outward foreign direct investment and international trade from the aspect of product [147]. Wang and Xu (2003) tested the relationship of trade and investment between China and Japan by Causality Tests, signifying that there is a long-term complementary relationship between Japan's direct investment in China and Sino-Japan trade, and also a two-way causal relationship between FDI and the export of finished products, but FDI only has a one-way causal relationship for the import level. Moreover, it is found that FDI and import trade have a short-term substitution effect [148]. By studying the export share of American multinational corporations in different industries in the Canadian market and the production status of local subsidiaries, as well as tariff levels of different industries, Hurst in 1974 found that there is a substitution relationship between investment and trade, and he considered that tariff-led investment replace the trade, and the degree of substitution has a positive correlation with the tariff level of industries in this country [149].

Zhu (2010) analyzed the general situation and obstacles of bilateral direct investment, and argued that expanding bilateral direct investment is of great significance, is one of the most effective way to solve economic imbalance, which can not only solve the structure imbalance encountered in the development of domestic economy in both countries, but also correct the imbalance of payments between China and the United States in the two effective ways of capital flow and trade flow [150]. Fu, Zhu, by means of co-integration test and error correction model, analyzed the US direct investment in China and the Sino-US trade data, and they believed that Sino-US trade imbalance is largely caused and expanded by the US direct investment in China, which mainly occurs from the processing trade of US investment in China and the reselling of manufactured products to America. Meanwhile, they considered that US direct investment in China not only affects the Sino-US trade with regard to total volume, but also affects the trade structure of China [151]. Chen (2006), Fu (2008) et al. argued that the Sino-US trade imbalance is, to a large extent, caused and expanded by the US direct investment in China [152][153]. Zhao (2009) proved, from the perspective of trade and investment integration, that there is a two-way causal relationship between US direct investment in China and China's exports to the US that is mutual influence [154]. Tian(2005), on the basis of co-integration theory, studied the long-term and short-term equilibrium relationship between US direct investment in China and the Sino-US import and export trade, and it follows from this that incremental US investment in China would promote the rapid advancement of Sino-US trade [155]. Bruker (2000) confirmed that the rapidly growing trade surplus between China and the United States is directly related to the growth in investment and operation of multinational corporations in China [156]. Lim and Moon (2001) proved that when developed countries invest in underdeveloped countries and the investment is newly established or it is a sunset industry in the home country, there is a positive correlation between outward foreign direct investment and trade [157]. Liu, Wang and Wei (2001) adopted the panel data of 19 countries and China and made an investigation in the causal relationship between FDI

which flows into China and trade, revealing that import triggers FDI, while FDI triggers export, and there lies a complementary relationship [158].

This chapter uses empirical analysis to test the relationship between foreign direct investment in China and Sino-US import and export trade from the perspective of time series. The main method adopted is co-integration analysis, and Eviews8.0 is used to analyze the relationship between foreign direct investment in China and Sino-US import and export trade. Empirical test is conducted to verify the impact of foreign direct investment in China on Sino-US trade and the degree of the impact.

5.10.1Data and variables

Considering the availability of data, this thesis selects the annual time series data from 1983 to 2019, and the data are mainly from Wind and the National Bureau of Statistics of China and obtained through sorting.

The variables involved in the test are as follows: FDI represents foreign direct investment in China, EX represents China's volume of exports to the US, IM represents China's volume of imports to the US, and TN represents the total volume of imports and exports between China and the US. To reduce the impact of heteroscedasticity fluctuations on the test, logarithmic transformation is performed on all the variables before empirical test, and FDI, EX; IM and TN are respectively transformed into LNFDI, LNEX, LNIM and LNTN.

Table 13: Amount of Foreign Direct Investment in China and Sino-US Trade Volume from 1983 to 2019

Unit: US$100 million

Year	Amount of foreign direct investment in China	China export volume to the US	China import volume from the US	Total Sino-US trade volume

1983	9.16	17.10	23.20	40.30
1984	14.19	23.00	36.60	59.60
1985	19.56	26.50	43.70	70.20
1986	22.44	24.70	35.30	60.00
1987	23.14	29.60	38.10	67.70
1988	31.94	33.80	66.30	100.10
1989	33.92	43.90	78.60	122.50
1990	34.87	51.90	65.80	117.70
1991	43.66	61.90	80.10	142.00
1992	110.08	85.04	89.01	174.05
1993	275.15	169.64	106.88	276.52
1994	337.67	214.61	138.94	353.55
1995	375.21	247.29	161.23	408.52
1996	417.26	267.08	161.79	428.87
1997	452.57	327.18	162.90	490.08
1998	454.63	379.65	169.97	549.62
1999	403.19	420.18	194.86	615.04
2000	407.15	521.42	223.65	745.07
2001	468.78	543.19	262.04	805.23
2002	527.43	699.59	272.28	971.87
2003	535.05	925.10	338.83	1263.93
2004	606.30	1249.73	446.53	1696.26
2005	603.25	1629.39	487.35	2116.74
2006	658.21	2035.16	592.23	2627.39
2007	747.68	2327.61	698.61	3026.22
2008	923.95	2523.27	814.97	3338.24
2009	900.33	2209.05	774.60	2983.65
2010	1057.35	2833.75	1020.60	3854.35
2011	1160.11	3245.65	1221.44	4467.09

2012	1117.16	3520.00	1328.78	4848.78
2013	1175.86	3684.81	1525.52	5210.33
2014	1195.62	3961.47	1591.87	5553.35
2015	1262.67	4101.45	1497.81	5599.26
2016	1260.01	3891.13	1351.24	5242.37
2017	1310.35	4331.46	1551.77	5883.24
2018	1349.66	4798.12	1553.66	6351.77
2019	1381.35	4179.36	1223.39	5402.75

Note: The data is from Wind and National Bureau of Statistics of China.[159][160]

Table 14: Logarithmic Values of the Figures in Table 13

Year	LNFDI	LNEX	LNIM	LNTN
1983	2.2148025	2.8390785	3.1441523	3.6963515
1984	2.6524318	3.1354942	3.6000482	4.0876556
1985	2.9734867	3.2771447	3.7773481	4.2513483
1986	3.1108451	3.2068032	3.563883	4.0943446
1987	3.1415627	3.3877744	3.6402143	4.2150862
1988	3.4638591	3.5204608	4.1941899	4.6061697
1989	3.5240048	3.7819143	4.3643717	4.808111
1990	3.5516269	3.9493188	4.1866198	4.768139
1991	3.7764324	4.1255202	4.3832759	4.9558271
1992	4.7012074	4.4431217	4.4887487	5.1593426
1993	5.6173164	5.1336785	4.6717067	5.6222832
1994	5.8220691	5.3688224	4.9340422	5.8680249
1995	5.9274859	5.5105513	5.0828298	6.0125337
1996	6.0337095	5.5875515	5.0862776	6.0611477
1997	6.1149424	5.7905221	5.0931113	6.194568
1998	6.1194839	5.9392491	5.1356187	6.3092256
1999	5.9994079	6.040685	5.2722976	6.4216937
2000	6.0091817	6.2565559	5.4100647	6.6134729

2001	6.1501336	6.2974575	5.5684816	6.6911218
2002	6.2680162	6.5505002	5.6068273	6.8792252
2003	6.2823602	6.8299034	5.8254974	7.1419821
2004	6.4073749	7.1306864	6.101499	7.4361818
2005	6.4023317	7.3959593	6.1889821	7.657631
2006	6.489524	7.6183311	6.3838926	7.8737468
2007	6.6169751	7.7525987	6.5490866	8.0150693
2008	6.828658	7.833312	6.7031479	8.113199
2009	6.8027614	7.700317	6.652351	8.0009031
2010	6.9635211	7.9493557	6.9281504	8.2569585
2011	7.0562701	8.0850701	7.107789	8.4044927
2012	7.018545	8.1662159	7.1920187	8.4864828
2013	7.0697551	8.2119733	7.3300922	8.5583983
2014	7.0864202	8.2843715	7.3726666	8.6221561
2015	7.1409838	8.3190963	7.3117589	8.6303899
2016	7.1388749	8.2664537	7.2087801	8.5645286
2017	7.1780496	8.373661	7.3471533	8.6798625
2018	7.207608	8.4759787	7.3483678	8.7564896
2019	7.2308138	8.3379127	7.1093802	8.5946627

Note: The values are calculated by Excel, where LNFDI is the logarithm of foreign direct investment in China; LNEX is the logarithm of China's export volume to the US; LNIM is the logarithm of China's import volume from the US; LNTN is the logarithm of the total Sino-US trade volume.

5.10.2 Empirical test

The test method used in this chapter is E-G two-step test. The specific steps are as follows: firstly, Augment Dickey-Fuller test (ADF) is used to determine the single integer order of

variables. If the tested ADF absolute value is smaller than the absolute value of the critical value, then the variable is considered to be unstable, that is, there is a unit root. If the tested ADF absolute value is greater than the absolute value of the critical value, then the variable is considered to be stationary, that is, there is no unit root. If a group of time series has a long-term co-integration relationship, then the single order integers of all the variables should be identical. Then ordinary least square (OLS) method is used to carry out co-integration regression of the variables. In the co-integration regression, it is necessary to test the error term of the model by graphical method or observation of DW value to see whether there is auto-correlation. If there is auto-correlation, it should be corrected. Finally, the stationary of the residual terms is tested, and ADF test method is still used. If the residual sequence passes the ADF test, then there is a long-term stable relationship between the variables, if not, there is no long-term stable relationship between the variables.

All the tests involved in this chapter are carried out in Eviews8.0.

5.10.2.1 Stationary test of variables

The unit root test is generally used to test whether the sequence is stationary or not. There are three main test methods: Augmented Dickey-Fuller test, Dickey-Fuller Test with GLS test and Philips Perron test. The purpose of stationary test is to avoid spurious regression. In this chapter, Augmented Dickey Fuller (ADF) unit root test is used to test the stationary of each variable. The test principle is as follows:

In general, the following estimation regression Equation is used to test whether the random sequence {y} is stationary:

$$\Delta y_t = \alpha_0 + \gamma_t + (\beta - 1) y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta y_{t-i} + \mu_t \quad (1)$$

When estimating the specific Equation, if the test results of the constant term and trend

term Y are not significant, they can be deleted; then the lag order can be determined by using the residual of the Equation to meet the white-noise process, and the specific length of lag order can be determined by AIC standard and SC standard. In general, the lag order of the length in the optimal estimation Equation should make the AIC and SC values minimum, and whether the random sequence {yt} is stationary is judged by the hypothesis test. The hypotheses are: H0：β=1, H1：β<1. The ADF value is the t test value of β in Equation 1. If the ADF value of β is greater than the critical value, hypothesis H0 is rejected, indicating that the sequence does not have unit root, that is, the original sequence is stationary; On the contrary, if the ADF value of β is smaller than the critical value, H1 is rejected, that is, the sequence has unit root and is non-stationary. The ADF test results of the variables are shown in Table:

Table 15：Unit Root Test Results of Variables

Variables	ADF Test Statistic	Test critical values			Type Test
		1% critical value	5% critical value	10% critical value	
LNFDI	-1.670437	-4.243644	-3.544284	-3.204699	(c,t,1)
△LNFDI	-3.253053	-3.632900	-2.948404	-2.612874	(c,0,0)
LNEX	0.432015	-4.234972	-3.540328	-3.202445	(c,t,0)
△LNEX	-3.823355	-3.632900	-2.948404	-2.612874	(c,0,0)
LNIM	-1.300880	-4.234972	-3.540328	-3.202445	(c,t,0)
△LNIM	-5.217963	-3.632900	-2.948404	-2.612874	(c,0,0)
LNTN	0.063250	-4.234972	-3.540328	-3.202445	(c,t,0)
△LNTN	-4.384112	-3.632900	-2.948404	-2.612874	(c,0,0)

Note: The test form (c, t, k) represents the constant term, trend term and lag order in ADF test.

According to the test results in Table, the ADF test values of LNFDI of foreign direct investment in China, LNEX of China's export volume to the US, LNIM of China's import

volume from the US and LNTN of Sino-US total volume of imports and exports are respectively greater than 10%, 5% and 1%. Hence, the four variables are non-stationary and have unit root. The ADF test values of the first-order difference sequence △LNFDI of the variables are less than 10% and 5%, and the ADF test values of △LNEX, △LNIM and △LNTN are respectively less than 10%, 5% and 1%, indicating that the four variables are first-order difference stationary and have no unit root. Hence, the conditions for co-integration test are met and co-integration test can be carried out.

5.10.2.2 Co-integration analysis

According to the ADF test above, LNFDI and LNEX, LNFDI and LNIM, LNFDI and LNTN are all single integer series of the same order, so the least square method (OLS) can be used to estimate the correlation between LNFDI and LNEX, between LNFDI and LNIM and between LNFDI and LNTN, and obtain the residual terms. Then unit root test (ADF) is carried out respectively on the residual terms. If the residual term is stationary, there is a co-integration relationship between foreign direct investment in China and Sino-US trade, that is, there is a long-term relationship between LNFDI and LNEX, between LNFDI and LNIM and between LNFDI and LNTN; if the residuals are non-stationary, there is no long-term co-integration relationship among the variables investigated.

Firstly, the model adopted in this thesis is determined as follows:

$$LNEX = \alpha_1 + \beta_1 LNFDI + \varepsilon_1 \qquad (2)$$

$$LNIM = \alpha_2 + \beta_2 LNFDI + \varepsilon_2 \qquad (3)$$

$$LNTN = \alpha_3 + \beta_3 LNFDI + \varepsilon_3 \qquad (4)$$

Secondly, the Equation of each model is estimated. The estimated results of LNFDI and LNEX, LNFDI and LNIM, LNFDI and LNTN by OLS method are as below:

LNEX=-0.439076+1.166719LNFDI (5)

(-1.337441) (20.90729)

R^2 =0.925866 F=437.1149 D.W=0.153323

LNIM=1.136860+0.789179LNFDI (6)

（3.661053） （14.95104）

R^2 =0.864621 F=223.5335 D.W=0.153630

LNTN=0.966869+1.005911LNFDI (7)

(2.939528) (17.99144)

R^2 =0.902423 F=323.6919 D.W=0.132052

When the OLS method is used to estimate the long-term relationship of the three groups of variables, it is detected that the frequency of the residual variance curves of the three groups of variables passing through the zero curve is small, and the DW value is relatively low, hence, it can be determined that the above models all have auto-correlation. In this chapter, the Cochrane-Orcutt iterative method is used to correct the positive auto-correlation, and the new estimating Equation obtained after the correction is as follows:

LNEX=9.535277+0.370906LNFDI+0.981622AR (1) (8)

(2.074618) (3.66628) （61.92663）

R^2 =0.996092 F=4205.346 D.W=1.642485

LNIM=6.887365+0.187364LNFDI+0.964490AR (1) (9)

(3.465971) (1.428336) （38.50376）

R^2 =0.986546 F=1209.938 D.W=1.670853

LNTN=9.304115+0.293007LNFDI+0.978004AR (1) (10)

(2.735174) (2.843704) （55.75281）

R^2 =0.994676 F=3082.929 D.W=1.542044

After the model correction, the frequency of the residual variance curves passing through the zero curves is greatly increased, the D.W value becomes close to the reasonable range, and the auto-correlation is eliminated.

On this basis, stationary test is conducted on the residual terms of the Equation, including ε_1, ε_2 and ε_3. If the residual terms are stationary, then there is a co-integration relationship between the amount of foreign direct investment in China and China's value of import and export with the US, that is, the estimation of the above Equation exists; if the residual term has unit root and is non-stationary, then there is no long-term co-integration relationship between foreign direct investment in China and China's import and export trade with the US, namely, the estimation of the above Equation is wrong. The test results of the residual terms are shown in Table.

Table 16：Stationary Tests of Residuals of the Equation

Variables	ADF Test Statistic	Test critical values			Stationarity	Type Test
		1% critical value	5%critical value	10%critical value		
ε_1	-4.783978	-2.632688	-1.950687	-1.611059	stationary	(0,0,0)
ε_2	-5.231943	-2.632688	-1.950687	-1.611059	stationary	(0,0,0)
ε_3	-4.674098	-2.632688	-1.950687	-1.611059	stationary	(0,0,0)

It can be seen from Table that at the significance level of 1%, the residual terms of the three models pass the stationary test. Therefore, it can be considered that the residual terms of the three models are stationary, and there are co-integration relations among the three groups of variables, that is, there is a long-term stationary equilibrium relationship between foreign direct investment in China and Sino-US volume of imports and exports. The models(8), (9)and(10)respectively represent the equilibrium relationship between foreign direct investment in China and China's export trade to the US, import trade and total volume of imports and exports between China and the US.

5.10.2.3 Granger causality test

The above test process shows that there is a long-term equilibrium relationship between foreign direct investment in China and China's export volume to the US, and between China's import volume to the US and China's total volume of imports and exports to the US, but it remains unclear whether this relationship can be called causality. Hence, Granger causality test is carried out respectively on foreign direct investment in China, China's export volume to the US and China's total volume of imports and exports to the US, so as to test the existence of causality between the variables.

The following two regressions need to be carried out to do the Granger causality test:

$$Y_t = \sum_{i=1}^{m} \alpha_i X_{t-i} + \sum_{i=1}^{m} \beta_i Y_{t-i} + \mu_{2t} \qquad (11)$$

$$X_t = \sum_{i=1}^{m} \lambda_i Y_{t-i} + \sum_{i=1}^{m} \delta_i X_{t-i} + \mu_{2t} \qquad (12)$$

The above two regressions are classified and discussed:

(1) If the coefficient set with Y lagged term in (12) is statistically different from 0, and the coefficient set with X lagged term in(11) is statistically 0, then there is a one-way causal relationship from Y to X;

(2) If the coefficient set with X lagged term in (11)is statistically different from 0, and the coefficient set with Y lagged term in (12)is statistically 0, then there is a one-way causal relationship from X to Y;

(3) If the lagged coefficients of X and Y are statistically different from 0 in both regressions, then there is a two-way causal relationship between X and Y;

(4)If the lagged coefficients of X and Y are statistically 0 in both regressions, then there is no causal relationship between X and Y.

The specific practice of Granger causality test is to carry out constrained regression and

unconstrained regression first, and then use the quadratic sum of the two residuals obtained to calculate the F-test statistic. The Granger causality test among foreign direct investment in China, Sino-US import and export volume and total trade volume is also conducted in Eviews8.0. The test results are shown in Table.

Table 17: Granger Causality Test Results

Null hypothesis	***F test statistic***	***P value***	***Conclusion***
LNFDI does not Granger Cause LNEX	2.88537	0.0540	Rejected
LNEX does not Granger Cause LNFDI	0.21584	0.8845	Received
LNFDI does not Granger Cause LNIM	0.47702	0.7009	Received
LNIM does not Granger Cause LNFDI	1.17754	0.3367	Received
LNFDI does not Granger Cause LNTN	1.01617	0.4009	Received
LNTN does not Granger Cause LNFDI	0.45758	0.7142	Received

It can be concluded from the test results in Table that, firstly, there is a one-way Granger causality between foreign direct investment in China and China's export trade with the US at the significance level of 10%, that is, the increase of foreign direct investment in China expands China's export volume to the US, but the growth of China's export trade to the US is not the Granger cause of foreign direct investment in China. Secondly, there is no Granger causality between foreign direct investment in China and China's import trade with the US, that is, the increase of China's import trade is not caused by the increase of foreign direct investment in China, and the increase of foreign direct investment in China is not the cause of the expansion of Sino-US import trade. Finally, there is no Granger causality between foreign direct investment in China and total volume of import and export trade between China and the US.

Of course, Granger causality test is not to test the causality in real sense, but the statistical causality. Therefore, the results of Granger causality test can only support the real causality,

but cannot be the most fundamental basis for affirming or negating the causality among variables.

5.10.2.4Analysis of test results

Through the above test and analysis, it can be concluded that there is a long-term equilibrium relationship between foreign direct investment in China and Sino-US import and export trade. Equations (8), (9) and (10) are the co-integration equations which can respectively represent the relationship among foreign direct investment in China, Sino-US import and export trade and total trade volume.

Co-integration equation (8) presents the regression results between foreign direct investment in China and China's export trade with the US. The R2 of the equation is 0.996092, and the coefficient of foreign direct investment in China is positive and passes the significance test at 1%, indicating that the increase of foreign direct investment in China promotes the growth of China's export trade to the US. The coefficient of foreign direct investment in China is 0.370906, which means that every 1% increase in foreign direct investment in China can lead to 0.370906% increase in China's export trade to the US. The equation also shows that there is a complementary relationship between foreign direct investment in China and China's export trade to the US.

Co-integration equation (9) shows the regression results between foreign direct investment in China and China's import trade to the US. The R2 of the equation is 0.986546, the coefficient of foreign direct investment in China is positive, but the coefficient did not pass the significance test, suggesting that the increase of foreign direct investment in China has no obvious impact on China's import trade with the US. The analysis of equations (8) and (9) shows that foreign direct investment in China exerts a significantly positive impact on China's export trade to the US, but has a limited impact on China's import trade with the US, thereby increasing the trade surplus between China and the US.

Co-integration equation (10) presents the regression results between foreign direct investment in China and total import and export volume between China and the US. The R2 of the equation is 0.994676; the coefficient of foreign direct investment in China is positive and passes the significance test at 1%, indicating that the increase of foreign direct investment in China promotes the development of Sino-US trade. The coefficient of foreign direct investment in China is 0.293007, suggesting that for every 1% increase in foreign direct investment in China, the import and export volume between China and the US will increase by 0.293007%, namely, the development of foreign direct investment in China exerts a role in promoting the development of Sino-US trade.

The Granger causality test shows that there is a one-way Granger causality between the amount of foreign direct investment in China and China's export volume to the US at the significance level of 10%. This indicates that the increase of foreign direct investment in China promotes the development of China's export trade to the US, thereby increasing China's trade surplus to the US.

5.11 SUMMERY

To sum up, the difference in the national saving ratio between China and the US exerts a significantly positive impact on the trade surplus of China to the US, that is, the greater the difference in the national saving ratio is, and the larger the trade surplus will be. The trade surplus did not decline with the relative appreciation of RMB, and the scale of Sino-US trade imbalance is quickly expanding.

Based on the findings of Statistical data analysis, I can claim that the structural imbalance in goods traded between China and the United States resulting in a huge trade gap between

the two countries. Meanwhile，Interest groups and the U.S. export control policies for high-tech products, China’s import substitution and export oriented foreign trade policy, China’s foreign investment policy of encouraging export which speed up the trade imbalance between China and the United States and deepen the trade imbalance between China and the United States. In the absence of effective international economic rules and systems, the trade imbalance between China and the United States is a political and economic behavior aimed at the rapid development of their own economy and the maximization of their economic interests.

Furthermore, in the context of economic globalization and international industrial transfer, While China has a large surplus with the US; its deficit with East Asia has risen. Through research, it is found that although both countries follow the common United Nations commodity trade statistical standards, the irrationality of the statistical standards and different understandings of the standards determined the differences in trade statistics between the two countries and artificially exaggerated the trade imbalance between China and the United States.

With China becoming the world's processing and manufacturing base, China has formed a trade structure dominated by processing trade on the whole. The raw materials and parts of processing trade mainly come from South Korea, Taiwan, Singapore and other Asian countries. Processed products are re-exported to the United States and European markets through Hong Kong. According to the statistics of the principle of origin, the exporting countries of processed products also transfer to China from these East Asian countries and regions. The US direct investment in China produces products and sells intermediate or finished products back to the US or other countries and regions, which drives the growth of China's export and produces the trade creation effect of FDI.

The increase of foreign direct investment in China has promoted the development of China's export trade to the United States, thus enlarging China's trade surplus with the

United States.

6. THE IMPACT OF SINO-US TRADE IMBALANCE

6.1 CHAPTER OVERVIEW

In this chapter, the impact of Sino-US trade imbalance is discussed. Firstly, the impact of Sino-US trade imbalance on China is discussed. The impact of Sino-US trade imbalance on China's employment, industrial structure upgrading, technological advancement, and economic interests is discussed. Through economic empirical methods, the study focuses on the economic interests of China in the Sino-US trade imbalance. Secondly, in this chapter, the impact of Sino-US trade imbalance on the United States is studied, and the impact of Sino-US trade imbalance on US economic development, the US ecological environment, and the US domestic income gap are studied separately. Through economic empirical methods, the study focuses on the economic development of the United States under the condition of Sino-US trade imbalance. Thirdly, the direct consequence of Sino-US trade imbalance—Sino-US trade friction is discussed in this chapter. Finally, the model established in this chapter predicts the short-term trade imbalance between China and the United States.

6.2 THE IMPACT OF SINO-US TRADE IMBALANCE ON CHINA

6.2.1 The Impact of Sino-US Trade Imbalance on China's Employment

Economic theory believes that the development of foreign trade and the expansion of exports can promote domestic employment, while expanding imports is to maintain foreign employment. China's foreign trade surplus with the United States has continued, and the

role of exports in promoting employment is greater than the impact of imports on employment. This is conducive to increasing employment and promoting domestic economic growth, maintaining political and social stability, and promoting harmonious social development. For a long time, foreign trade enterprises have a strong ability to absorb employment, and foreign trade has played a huge role in promoting labor employment. Trade in goods is the export of labor services without going abroad, which can alleviate the employment pressure in China to a certain extent. China's exports to the United States totaled $429.7 billion in 2017. According to Zhao's [161] calculations, China's export trade to the United States covers a total of 11.751 million jobs, accounting for 1.5% of China's total employment. Among them, the primary industry accounts for 5%, the secondary industry accounts for 88%, and the tertiary industry accounts for 7%.

6.2.2 The Impact of Sino-US Trade Imbalance on China's Industrial Structure Upgrading and Technological Advancement

China is in a critical period of accelerating the adjustment of economic structure and transforming the mode of growth. Importing raw materials and introducing advanced foreign technology and equipment require huge amounts of foreign exchange. The trade surplus between China and the United States allows China to have sufficient foreign exchange reserves that can be used to import advanced international technologies and processes, and purchase capital goods, raw materials, machinery and equipment necessary for production, thus giving full play to the advantage of backwardness of developing countries. The United States has promoted the adjustment of China's industrial structure in the process of industrial transfer to China. Multinational corporations in the United States not only have advanced production technology and management experience, but most of their direct investment in China is through cooperation with local Chinese companies. Chinese enterprises can learn advanced technology and management experience in cooperation with multinational corporations in the United States, thus improving their own

competitiveness. As China's exports to the United States are mainly labor-intensive products and the United States has a large trade deficit, the United States will often use non-tariff barriers to restrict imports from China. Under pressure, China needs to transform the structure of export products and increase the scientific and technological content of export products. Therefore, Sino-US trade imbalance provides an opportunity for China to improve its industrial structure and export product structure.

6.2.3 Empirical Study on the Impact of Sino-US Trade Imbalance on China's Economic Interests

At present, the international trade is dominated by transnational corporations, with production factors flowing among countries. International division of labor and industry transfer makes it impossible for traditional trade theories to accurately reflect the real gains and losses of a country's foreign trade, and the surplus and deficit of foreign trade are no longer the criteria to define the gains or losses of a country's foreign trade. China's economy is export-oriented. High investment rate has created many jobs and promoted the development of China's dual economy. However, the excessive dependence of economic growth on export-oriented economy and the US market increases the operational risk of China's economic development. Affected by diminishing marginal effects, the impetus of export to China's economy is gradually weakening.

Imbalance of Sino-US Trade Benefits Distribution

The issue of benefits distribution in international trade has always been the focus in international trade. From the perspective of trade effect, trade benefits include static trade benefits and dynamic benefits [162]. Static trade benefits refer to the direct economic benefits obtained by both trading parties when the total amount of resources and technology remain unchanged. Dynamic trade benefits refer to the indirect positive

influence on the economic and social development for both sides after the trade starts by means of international division of labor and exchange.

Heckscher (1919) preliminarily established an analytical framework for the impact of trade on factor prices. The trade benefits change the income of different factor owners through the change of factor prices, and non-trade participants can also attend the distribution of trade benefits through the change of factor prices [163]. Lewis (1955) further expanded the sources of trade benefits. The trade benefits are not only limited to the fields of production and consumption, but should also contain value concepts and other aspects. Trade stimulates people's desire for more production or labor efficiency promotion by introducing new commodities to the society for demand stimulation [164]. Cai (2006) and Wang (2006), based on the specific analysis of Sino-US trade, both argued that on the condition of current huge Sino-US trade deficit, China's trade benefits are limited [165]. Liu and Chen (2006) believed that under the circumstances of Sino-US trade imbalance, which benefit the most from Sino-US trade are the American corporate consumers [166]. Lin and Duan (2008) analyzed the issue of Sino-US trade benefits distribution in the context of globalization from the subjects of the government, enterprise and individual, articulated that there was inflow of trade benefits for China behind US trade deficit which caused the unsustainability of China's economic development and the sustainability of America's economic development, which fundamentally restricts the promotion of international competitiveness and prospect in future development for China. Thus, it is necessary to accelerate the transformation of China's foreign trade strategy to expand China's foreign trade benefits [167].

Kahn (2007) stated that, according to the report from Morgan Stanley, Sino-US trade saved nearly 100 billion US dollars for American consumers and created 4 million new jobs for the United States in 2004 alone [168]. A joint study was conducted by the Center for Strategic and International Studies and Institute for International Economics, Bergstern et al (2006) concluded that Sino-US trade increased nearly 70 billion US dollars wealth for the United States [169]. Based on the Oxford Macroeconomic Forecasting Model, a report

of Oxford Economics and the Signal Group (2006) showed that Sino-US trade could increase 0.7% in GDP for the United States and reduce 0.8% in the inflation rate by 2010 [170]. Despite China has gained a large surplus from its trade with the US in Sino-US trade, it turned out to be China's foreign exchange reserves and flowed into the capital market of the United States. Thus, Elwell (2007) believed that it was the inflow of Chinese capital that effectively reduced the long-term interest rate of the US and supported the economic development of the US [171]. Zhang and Dai argued that the United States not only occupies the high value-added links in the global value chain to monopolize the huge interests in the value chain, but also gains benefits through foreign direct investment. The trade gap between China and the United States cannot prove that the United States becomes the loser while China becomes the gainer [172]. Besides, in some literatures indexes such as export value added, value-added rate and factor added value have been adopted to measure the Sino-US trade benefits. For instance, Wang And Sheng, Zheng and Yu, Xiong and Fan and Zhao made a secondary decomposition of Sino-US trade benefits from the perspective of value added, and found that traditional trade statistics have caused a serious mismatch between Sino-US trade balance and trade benefits, and the distribution pattern of Sino-US trade benefits is developing in a direction unfavorable to China [173][174][175][176]. Zheng and Yu believed that compared with increase value statistics, the gross value statistics have overestimated the bilateral trade imbalance between China and the United States by about 25%, and the distribution of trade benefits is increasingly unfavorable to China [177].

Wang combined the development of productivity, the change of labor value and the comparative benefits of trade, and established the theoretical framework of dynamic comparative cost based on the theory of labor value. He deemed that when developing countries take advantage of their comparative advantages to participate in the division of international trade, they must bear the trade national value loss [178]. By adopting the traditional surplus index, trade price index and trade value added index, Zeng and Zhang defined the trade gains of China's major manufacturing sectors against the United States, and found that the main technical factors leading to trade disputes are different methods for

calculating trade benefits. More significantly, the value added in China's manufacturing sector's trade with the US has been increasing year by year, but the proportion of trade value added has not substantially improved [179]. Based on the theory of intra-product division of labor, Liu and Yang constructed a theoretical model for the distribution of bilateral trade benefits, and made an empirical analysis of the trade benefits in major manufacturing sectors in China and the United States. The findings show that the benefits distribution is opposite to the direction of trade balance behind the Sino-US trade imbalance, and there is a huge profit for the United State and a meager profit for China [180].

Samuelson adopted the traditional free trade model and analyzed the distribution of Sino-US trade benefits. He believed that under the premise of demand inelasticity, China's technological innovation would not only lead to deterioration of trade conditions and GDP deduction, but also shake the leading economic status of the United States, resulting in that the United States could not profit from China's expanded product export [181].

Above all, trade benefits are the core issue of foreign trade, and economists have long focused on it and made the corresponding studies. Subject to the characteristics in era and their own interests of tendency, the conclusions reached also are different. Hence, constructing a model that can reflect the Sino-US trade and Sino-US economic gap to measure the Sino-US trade benefits is of great significance in figuring out and further alleviating the Sino-US imbalance and trade frictions between China and the United States.

6.2.3.1 Model description

This chapter attempts to judge the distribution of trade benefits, that is, to investigate the results of benefit distribution from the general impact of benefit distribution on a country's economy and on the macro level. The logic of this chapter is as follows: if the benefit distribution of Sino-US trade is unbalanced, then the trade will definitely exert different

degrees of impacts on the economic development of the two countries, namely, the advantageous party in the distribution will benefit more and thus the trade will promote its economy more than the disadvantageous party. In short, if the benefit distribution is uneven, the trade expansion and economic gap will be inevitable, the former is the cause, and the latter is the result. The other way round, if trade expansion and economic gap occur, then unbalanced distribution of trade benefits, the only reason, exists.

The specific empirical analysis is to test the correlation between China's exports to the US and the Sino-US economic gap. If the regression coefficients of China's exports and the Sino-US economic gap are positive, then China's exports have widened the Sino-US economic gap, and the distribution of trade benefits is adverse to China, and vise versa. In this thesis, considering that the export commodities contain domestic elements and resources and the imported commodities contain foreign elements and resources, China's exports to the US are used to replace China's total import-export volume to the US. Such replacement can endow the analysis with more representativeness and practical significance. At the same time, because the econometric method used in this thesis is co-integration, and the co-integration relationship between two variables does not affect the co-integration relationship between other variables and the two variables, the above replacement is reasonable in measurement theory.

In addition, the calculating equation of national income by expenditure approach, GDP=C+I+G+(NX), shows that in addition to trade, the factors affecting a country's economic development include consumption, investment and government purchase. The difference between the GDP of China and the US is:

$$GDPB = GDP_A - GDP_C = (C_A - C_C) + (I_A - I_C) + (G_A - G_C) + (NX_A - NX_C)$$

To establish a regression model, the consumption, investment, government purchase and net export should be included in the model. However, this chapter discusses the distribution of trade benefits, and the distribution result is embodied as the effect of exports

on economic development. In addition, during the analysis period from 1983 to 2019, the trade structures of China and the US did not change greatly, indicating that the consumption, investment and government purchases of China and the US have not exerted enough impacts on the trade structure. Hence, when establishing the model, it is assumed that consumption, investment and government purchases are unchanged, and only the relationship between exports and economic gap is discussed.

Based on the above explanation, this thesis intends to establish the following model to test the relationship between China's exports to the US and the Sino-US economic gap:

$$GDPB = c + \alpha \times EX \quad (1)$$

Where GDPB represents the Sino-US economic gap, which is defined as the total GDP of the US subtracting the total GDP of China, EX represents China's exports to the US, and c is a constant term. The regression parameters are estimated with EX as the explanatory variable. If the coefficient α of China's exports to the US is significantly positive, then the exports have widened the Sino-US economic gap (because GDPB=US GDP-China's GDP); if the coefficient of exports is significantly negative, then the exports have narrowed the Sino-US economic gap.

6.2.3.2 Econometric test

Because general economic indicators have a certain trend, if they are directly regressed, they can basically show a certain correlation. Therefore, to confirm the long-term equilibrium relationship between and, it is necessary to conduct co-integration test on them. The economic significance of co-integration test lies in that although two variables have their respective long-term fluctuation law, as long as they are co-integrated, there is a long-term stationary proportional relationship between them. This is because if two sequences can be linearly combined into a new and stationary sequence, then there is a certain long-term stationary relationship between the two sequences, and the residual term produced by regression analysis of the two sequences can be regarded as the linear

combination of the two sequences. In this way, it is only required to prove that the residual term is integrated and the integration order is smaller than that of the original sequences. In this thesis, E-G two-step method is used to conduct the co-integration test.

6.2.3.3 Data source

Table 18：The Difference of GDP between China and the US and China's Exports to the US

Year	The US GDP	China’s GDP	GDPB	China’s exports EX
1983	36300	2307	33993	17.10
1984	40400	2599	37801	23.00
1985	43400	3095	40305	26.50
1986	45800	3008	42792	24.70
1987	48600	2730	45870	29.60
1988	52400	3124	49276	33.80
1989	56400	3478	52922	43.90
1990	59600	3609	55991	51.90
1991	66100	3834	62266	61.90
1992	65200	4269	60931	85.04
1993	68600	4447	64153	169.64
1994	72900	5643	67257	214.61
1995	76400	7345	69055	247.29
1996	80700	8637	72063	267.08
1997	85800	9616	76184	327.18
1998	90600	10300	80300	379.65
1999	96300	10900	85400	420.18
2000	102500	12100	90400	521.42
2001	105800	13400	92400	543.19
2002	109400	14700	94700	699.59
2003	114600	16600	98000	925.10
2004	122100	19600	102500	1249.73
2005	130400	22900	107500	1629.39
2006	138100	27500	110600	2035.16
2007	144500	35500	109000	2327.61
2008	147100	45900	101200	2523.27
2009	144500	51000	93500	2209.05
2010	149900	60900	89000	2833.75
2011	155400	75500	79900	3245.65

2012	162000	85300	76700	3520.00
2013	167800	95700	72100	3684.81
2014	175200	104800	70400	3961.47
2015	182200	110600	71600	4101.45
2016	187100	112300	74800	3891.13
2017	194900	123100	71800	4331.46
2018	205300	138900	66400	4798.12
2019	213700	143400	70300	4179.36

Data sources: 1.Website of National Bureau of Statistics of the People's Republic of China; 2.Wind database.[182][183]

In the table above, the second and third columns respectively represent the GDP of the two countries; the fourth column GDPB represents the difference between the GDP of the US and China, and the fifth column EX represents China's exports to the US. Eviews8.0 is used in this thesis for econometric analysis.

6.2.3.4Integration test

Firstly, integration test is conducted on GDPBt. The appropriate model (1) for ADF test is:

$$\Delta^3 GDPB_t = -1.271207 \times \Delta^2 GDPB_{t-1} \quad (2)$$
$$(-6.656506)$$

In the bracket is the t-test value. t=-6.656506<-1.95100 (critical value at 5%), the ADF test value is smaller than the critical value, and the hypothesis that there is unit root in the sequence is rejected. Therefore, the sequence GDPB is stationary after two differences, and it is second-order integrated.

The model for ADF test on is as follows:

$$\Delta^3 EX_t = -1.422411 \times \Delta^2 EX_{t-1} \quad (3)$$
$$(-6.783775)$$

In the bracket is the t-test value. t=-6.783775<-1.95100 (critical value at 5%), the ADF test

value is smaller than the critical value, and the hypothesis that the sequence has unit root is rejected. Hence, the sequence EX is also second-order integrated.

As the two sequences are second-order integrated and meet the conditions of same order integration, the co-integration test can be done on the two sequences.

6.2.3.5 Co-integration test

Firstly, the regression models of $GDPB_t$ and EX_t are established:

$$GDPB_t = \underset{(15.57747)}{67931.77} + \underset{(2.048007)}{4.060189} \times EX_t \quad (4)$$

R^2 =0.101818 D.W. =0.052469 F=3.967612

Secondly, stationary test is conducted on the regression residual term. The test value t=-1.805351<-1.611059(critical value at 10%), indicating that and are (2, 2) co-integrated.

In the above model, t-test value is in the bracket. The t-test value, F-test value and coefficient of determination show that, the fitting degree of the model is general. At the same time, the DW value suggests that the residual term in the model has strong auto-correlation, so appropriate lag term can be added to eliminate the auto-correlation. The distributed lag models $GDPB_t$ of EX_t are as follows:

$$\underset{\quad}{GDPB_t} = \underset{(1.629745)}{3149.659} - \underset{(-2.082037)}{4.556012} \times EX_t + \underset{(1.880320)}{4.187052} \times EX_{t-1} + \underset{(9.960671)}{1.516470} \times GDPB_{t-1} - \underset{(-3.570797)}{0.538202} \times GDPB_{t-2} \quad (5)$$

$\bar{R}^2$ =0.976514 D.W. =1.975344 F=354.4142

Here, DW approaches 2 and the auto-correlation are eliminated. ADF test is carried out on the residual term e_t .

$$\Delta e_t = -1.028180 \times \Delta e_{t-1}$$

(-5.754769) (6)

The test value t=-5.754769<-1.95100 (critical value at 5%), the residual term has no unit root under the significance level of 5%, and it is stationary. Equation (5) presents their long-term stationary equilibrium relationship. The long-term variable proportion of EX_t and $GDPB_t$ is:（-4.556012+4.187052）/（1-1.516470）=0.7144.

The parameter estimation of the above regression model and co-integration test results show that China's exports to the US have indeed widened the Sino-US economic gap. Every 1 unit increase of exports can lead to 0.7144 units' expansion of economic gap.

6.2.3.6 Regression Model and Test Results given by Eviews8

Table 19: Regression Model of GDPBt and EXt
Dependent Variable: GDPB
Method: Least Squares
Date: 11/03/20 Time: 23:11
Sample: 1983 2019
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	4.060189	1.982507	2.048007	0.0481
C	67931.77	4360.900	15.57747	0.0000

R-squared	0.101818	Mean dependent var	74036.74
Adjusted R-squared	0.076156	S.D. dependent var	20711.21
S.E. of regression	19906.95	Akaike info criterion	22.68806
Sum squared resid	1.39E+10	Schwarz criterion	22.77514
Log likelihood	-417.7292	Hannan-Quinn criter.	22.71876
F-statistic	3.967612	Durbin-Watson stat	0.052469
Prob(F-statistic)	0.054231		

Table 20: The distribution lag regression model of GDPBt and Ext

Dependent Variable: GDPB
Method: Least Squares
Date: 11/03/20 Time: 23:11
Sample (adjusted): 1985 2019

Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3149.659	1932.609	1.629745	0.1136
EX	-4.556012	2.188247	-2.082037	0.0460
EX(-1)	4.187052	2.226777	1.880320	0.0698
GDPB(-1)	1.516470	0.152246	9.960671	0.0000
GDPB(-2)	-0.538202	0.150723	-3.570797	0.0012

R-squared	0.979277	Mean dependent var	76216.16
Adjusted R-squared	0.976514	S.D. dependent var	19066.10
S.E. of regression	2921.921	Akaike info criterion	18.92943
Sum squared resid	2.56E+08	Schwarz criterion	19.15163
Log likelihood	-326.2651	Hannan-Quinn criter.	19.00613
F-statistic	354.4142	Durbin-Watson stat	1.975344
Prob(F-statistic)	0.000000		

Table 21: Stationarity test of GDPBt and EXt regression residuals

Null Hypothesis: E has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.754769	0.0000
Test critical values:	1% level	-2.634731	
	5% level	-1.951000	
	10% level	-1.610907	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(E)
Method: Least Squares
Date: 11/03/20 Time: 23:03
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E(-1)	-1.028180	0.178666	-5.754769	0.0000

R-squared	0.499876	Mean dependent var	173.5054
Adjusted R-squared	0.499876	S.D. dependent var	3911.594
S.E. of regression	2766.258	Akaike info criterion	18.71735

Sum squared resid	2.53E+08	Schwarz criterion	18.76224
Log likelihood	-317.1949	Hannan-Quinn criter.	18.73266
Durbin-Watson stat	1.942253		

6.2.4 Other Adverse Effects of Sino-US Trade Imbalance on China

China's large surplus leads to uncertainty to economic growth. The rising large trade surplus reflects the high dependence of China's economy on the US market. China's economic growth has shown an obvious characteristic of driving by external demand, and excessive reliance on external demand has increased China's dependence on foreign trade and brought uncertainty to economic growth. In particular, part of China's surplus is the trade surplus brought about by the export of some resource-based products, and this means that the continuous development of domestic resources will bring hidden dangers to future economic development. In addition, the large-scale surplus in the balance of payments has led to excessive growth of the money supply and abundant liquidity, which can easily lead to credit expansion. Excess funds will flow to profiteering industries and sectors, which will lead to bubbles and will not be conducive to the sustainable development of the economy. Trade imbalances tend to shrink China's foreign exchange assets. China's large trade surplus from the United States has rapidly increased China's foreign exchange reserves, and China's foreign exchange reserves are mainly held in dollars. The huge trade deficit, huge government deficit and household asset deficit of the United States continuously devalues the dollar. Under this circumstance, China’s US dollar-based foreign exchange reserve assets and long-term bond assets held by the US government will shrink, leading to a lot of losses on foreign assets.

6.3 THE IMPACT OF SINO-US TRADE IMBALANCE ON THE UNITED STATES

6.3.1 Empirical Study on the Impact of Sino-US Trade Imbalance on the US Economy

While a country's trade deficit continues to expand, its domestic economy can also develop rapidly. The continuous expansion of the Sino-US trade imbalance has promoted the growth of the US economy. The rapid development of the US economy benefits from the advanced structure of its industry. Since the 1950s, the United States began to transfer industries abroad, keeping its industrial structure at the top of the world's industrial structure, which effectively promoted the economic development of the United States. Under the background of economic globalization, the transfer of US industries to China has boosted the growth of the US economy and its direct investment in China, but at the same time, it has aggravated the scale of Sino-US trade imbalance. There are significant differences in factor endowments between China and the United States. For this reason, China produces labor-intensive products while the United States produces capital-intensive and technology-intensive products. There are obvious complementary advantages between China and the United States. The goods the United States imports from China are mainly resource-intensive and labor-intensive products, most of which are cheap daily consumer goods. According to the theory of supply and demand, when total demand is greater than total supply, commodity prices will rise. Inflation will occur when the price of a large number of goods in the United States rises. The United States imports a large number of high-quality and low-cost commodities from China to make up for the shortage and gap in the supply of related industries in the United States, thereby increasing the total effective domestic supply in the United States, making up for the consumption gap, curbing price

increases, and eliminating inflation. The US commodity trade with China has promoted the development of its related industries, injected impetus into the upgrading of US domestic industries, which indirectly promoted US economic growth. China is not the sole owner of the benefits of the Sino-US trade imbalance. A large part of these benefits are gained by US-owned enterprises in China. Moreover, the proportion of processing trade in exports to the United States is as high as 50%, and the main feature of processing trade is the import of a large number of raw materials and parts. After being processed into products and then exported, most of the proceeds from processing trade are owned by foreign-funded enterprises, while China only gets meager processing fees. For example, to assemble a computer, China's assembly fee is only 30%, while 70% is owned by foreign-funded enterprises. Based on this factor, it can be said that the real beneficiaries of the Sino-US trade imbalance are US-owned enterprises and US consumers.

6.3.1.1 Model Construction

To conduct a quantitative study on the impact of Sino-US trade imbalance on the US economy, this chapter adopts the variables of US GDP and US import volume from China, and establish the model as follows:

$$LnGDP=a+b*LnIMP+e$$

In which, LnGDP is the natural logarithm of US GDP, LnIMP is the natural logarithm of US import volume from China, a is a constant term, B is the influence coefficient to be estimated, and e is the residual.

6.3.1.2 Data source and description

This chapter selects the annual data, as well as the data of US GDP and US imports from China of 37 years from 1983 to 2019. All the data are valued in billions of dollars.

Table 22: US GDP data

Unit: trillion US dollars

Year	US GDP
1983	3.63
1984	4.04
1985	4.34
1986	4.58
1987	4.86
1988	5.24
1989	5.64
1990	5.96
1991	6.61
1992	6.52
1993	6.86
1994	7.29
1995	7.64
1996	8.07
1997	8.58
1998	9.06
1999	9.63
2000	10.25
2001	10.58
2002	10.94
2003	11.46
2004	12.21
2005	13.04
2006	13.81
2007	14.45
2008	14.71
2009	14.45
2010	14.99
2011	15.54
2012	16.2
2013	16.78
2014	17.52
2015	18.22
2016	18.71
2017	19.49
2018	20.53
2019	21.37

Source: Wind- Economic Database

Table 23: Data of Sino-US import and export trade

Unit: 10000 US dollars

Year	China exports to the United States	China imports from the United States
1983	171,000	232,000
1984	230,000	366,000
1985	265,000	437,000
1986	247,000	353,000
1987	296,000	381,000
1988	338,000	663,000
1989	439,000	786,000
1990	519,000	658,000
1991	619,000	801,000
1992	850,400	890,100
1993	169,640,0	106,880,0
1994	214,6100	138,940,0
1995	2,472,874.30	1,612,296.60
1996	2,670,808.60	1,617,865.10
1997	3,271,837.90	1,628,958.90
1998	3,796,497.30	1,699,694.50
1999	4,201,807.70	1,948,631.70
2000	5,214,200.20	2,236,460.60
2001	5,431,891.20	2,620,359.20
2002	6,995,940.20	2,722,790.00
2003	9,251,014.70	3,388,296.30
2004	12,497,345.10	4,465,266.00
2005	16,293,872.20	4,873,497.70
2006	20,351,628.70	5,922,285.60
2007	23,276,133.10	6,986,058.10
2008	25,232,726.60	8,149,672.50
2009	22,090,481.00	7,746,032.50
2010	28,337,485.60	10,206,045.30
2011	32,456,473.50	12,214,439.00
2012	35,199,988.30	13,287,829.70
2013	36,848,066.30	15,255,224.60
2014	39,614,740.47	15,918,730.80
2015	41,014,516.94	14,978,093.13
2016	38,911,253.57	13,512,428.36
2017	43,314,647.73	15,517,727.48
2018	47,981,164.16	15,536,585.43
2019	41,793,571.80	12,233,890.90

Source: Wind- Economic Database

6.3.1.3 Data adjustment

Since the data of US GDP and US imports from China are both current prices, the price indices need to be adjusted in order to make the annual data comparable. The base period of the adjustment is 1983 and set to be 100. Then, to avoid large difference between the values of the variables, the natural logarithms of all the adjusted data are obtained.

6.3.1.4 Empirical test and results

The annual data of China's imports and US economic growth from 1983 to 2019 are tested, the two variables are treated equally as endogenous variables, the CE model with intercept under Johansen co-integration test is selected, and EVIEWS8.0 is used to obtain the following test results:

Table 24: Johansen Co-integration Test between US GDP and U.S.-China Trade

	Eigenvalue	Trace statistic	5% critical value	Assumed CE number
Trace test	0.575894	33.20364	20.26184	None *
	0.086895	3.181651	9.164546	At most 1
	Eigenvalue	Max-eigen statistic	5% critical value	Assumed CE number
Maximized eigenvalue test	0.575894	30.02199	15.89210	None *
	0.086895	3.181651	9.164546	At most 1

Note: The lag interval is 1-1, * denotes that the null hypothesis is rejected at 5% significance level. Conclusion: Trace test and maximum eigenvalue test indicate that there is a co-integration equation at the 5% level.

According to the test results in Table, the two variables are treated equally as endogenous variables. The trace test and maximum eigenvalue test show that there is a co-integration equation at the 5% level. The standardized co-integration relational expression is as follows:

$$LnGDP=0.462082\times LnIMP+7.252718$$

(8.773154)　　（15.45038）

The T statistic is in the bracket under the coefficient of the co-integration variable. Since the T statistic is large, the variable is significant in the co-integration relational expression. As the estimated coefficient of LnIMP is 0.462082, which indicates that the US import volume from China has a significant positive impact on the US GDP. If the US import volume from China accelerates by **1%**, the US GDP gains a synchronous growth of **0.462082%**.Unit root test is conducted on the EC sequence:

Table 25: Unit Root Test of EC Sequence

Variable definition	AADF statistic	10% critical value	Test form(C,T,P)
LnGDP and LnIMP EC sequence	-1.930898	-1.611059	（0，0，1）

It can be seen from the above table that the EC sequence is stationary at 10% level and fluctuates around 0. The following conclusion can be drawn: there is a bidirectional long-term relationship between the changing trend of U.S.-China trade deficit and US GDP. Meanwhile, the coefficient of LnIMP in the co-integration relational expression is positive, so the Sino-US trade contributes to the American economic growth in the current period.

6.3.2 The Impact of Sino-US Trade Imbalance on the Ecological Environment of the United States

Most of the products that the United States exports to China are not produced in the United States. They are produced by multinational companies in the United States using global resources. This will reduce the consumption of domestic resources by the United States. In such a trade pattern, China's trade surplus comes at the expense of consuming its domestic resources and destroying the environment, and this will also provide welfare for the US consumers and promote the operation of US economy. The larger China's trade surplus is, the more negative externalities such as resource consumption and environmental pollution generated by US domestic production will be transferred to China. This will speed up China's resource depletion rate and aggravate environmental pollution, thus slowing down the resource depletion rate of the United States and maintaining its good ecological environment. Therefore, the United States has obtained huge social benefits in addition to economic benefits when importing products from China.

6.3.3 The Impact of Sino-US Trade Imbalance on the Domestic Income Gap in the United States

In commodities exported by the United States to China, the production factors used are mainly capital and high-tech labor, while the production factors used in commodities imported from China are mainly low-tech labor. Therefore, the result of Sino-US trade is to increase the income of capital owners and high-tech workers, but reduce the income of low-tech workers. This will further widen the gap between the incomes of high-income earners and low-income earners in the United States. At present, China's exports to the United States are mainly daily groceries such as clothing, footwear, and luggage. These are mainly labor-intensive products, promoting the employment of a large number of people.

As a result, the interest groups of the US manufacturing industry use this as an excuse to oppose the expansion of China's export to the United States. It must be noted that this kind of unemployment in the manufacturing industry in the United States is mainly due to structural unemployment brought about by the upgrading of the US domestic industrial structure under the background of economic globalization.

6.3.4 Other Adverse Effects of Sino-US Trade Imbalance on the United States

The growing trade surplus between China and the United States has increased the current account deficit of the United States and raised the risks in the operation of the US economy. The rapid growth of the scale of Sino-US trade imbalances threatens the hegemony of the US dollar in the international monetary system, and increases the pressure on the devaluation of the US dollar, thus affecting the flow of foreign capital into the US financial market and increasing the uncertainty of its economic development.

6.4 THE IMPACT OF US TRADE DEFICIT WITH CHINA ON THEIR TRADE FRICTION

In an essay by Hu and Peng, trade friction is defined as a trade dispute that is initiated when one country suffers losses due to another country's gains in their bilateral trade activities [184]. China, with which the US trade deficit is largest, has always been targeted when US develops its polices to reverse that situation. That will ultimately lead to bilateral trade friction. At the state level, the interdependence between China and the United States is asymmetric and thus US has the ability and willingness to provoke the trade friction because its opportunity cost is smaller. On one hand, United States imposes import

restrictions on China. On the other, it pushes the Chinese government to open markets to more American companies. Besides, interest groups that affected by China's imports will also use the trade deficit as an excuse to press the government to attack China, triggering US-China disputes. In a manner of speaking, the trade imbalance between China and the United States contributes most to their trade friction. Since the Agreement on Trade Relations Between the People's Republic of China and the United States of America was signed on May 14, 1979, the US-China trade has witnessed rapid development during more than 40 years, and the two sides have built a mutually beneficial and win-win trade pattern under a interdependence relationship. During each stage of the bilateral trade development, however, trade friction has always accompanied and become intensively severe. Trade friction gradually escalated.

6.4.1 Trade friction before China's entrance to WTO

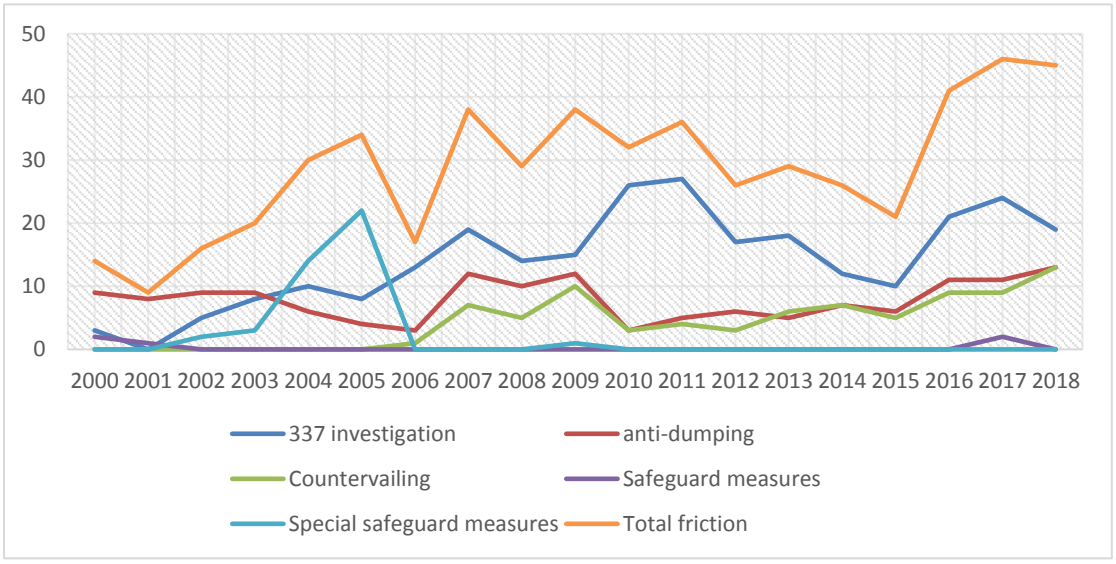
The trade volume involved in friction of that period was relatively small. China's exports to the US were mostly low value-added and labor-intensive commodities such as chemical materials, textiles and light industrial products. The US trade policy towards China was also relatively looser. On July 2, 1980, the United States initiated its first anti-dumping investigation against China's menthol and that represented the start of US-China trade friction. At this stage, the United States launched 18 anti-dumping investigations for Chinese goods in total, of which 6 were light industrial products, 7 were chemical products, and 3 were textiles. The number of cases and involved amount were small, and the friction was only for individual commodities.

6.4.2 Trade friction after China's entrance to WTO

The trade value between the two sides increased continuously during this period. China's

widening trade surplus with the US had led to various forms of trade frictions, including the "Section 337 investigations", anti-dumping investigations, countervailing duty investigations, safeguard measures, and special safeguard measures, etc..

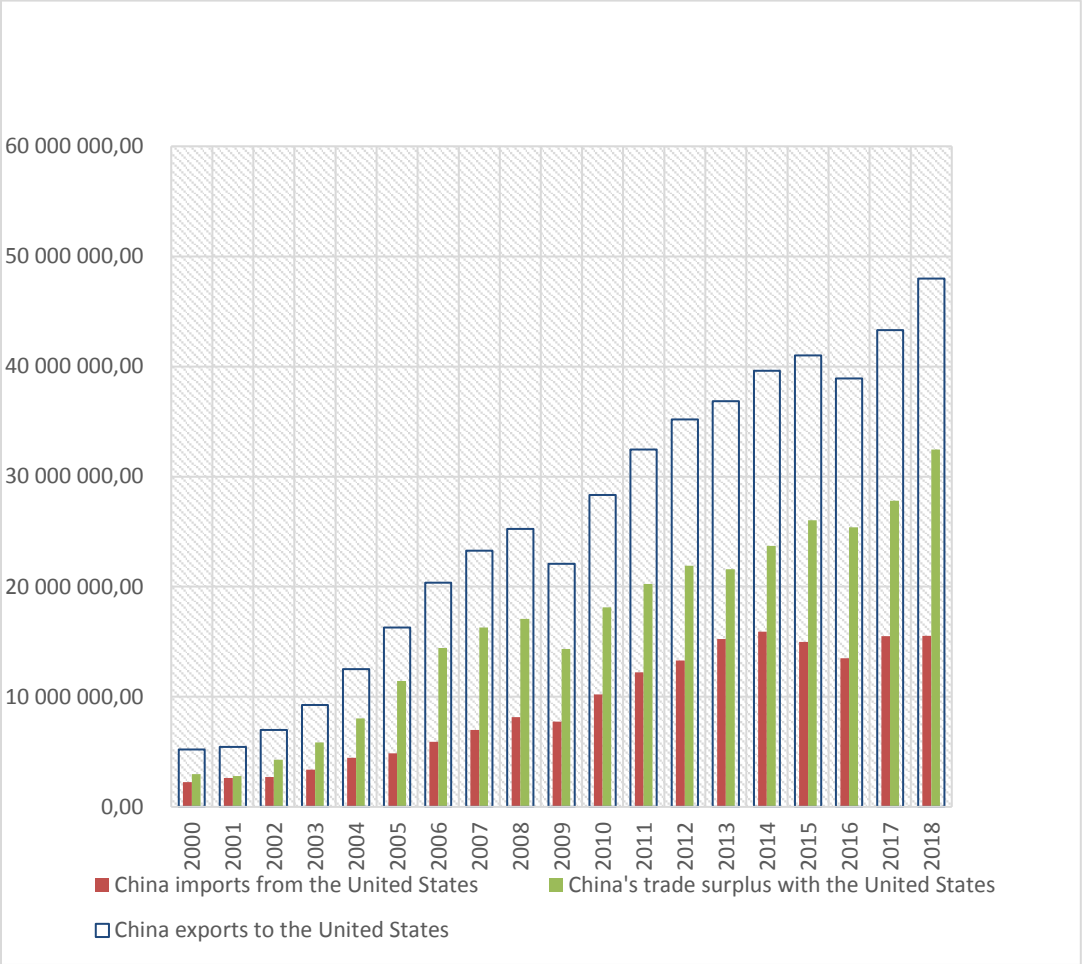
Figure 17: US trade investigation on china



Source: China Trade Remedies Information [185]

Figure 18: China’s trade surplus with the United States

Unit: 1000USdollars



Source: Website of China Statistics Bureau [186]

The "Section 337 Investigation" was legally based on "Section 337", an act to protect domestic intellectual property rights of US against unfair foreign trade practices. That law was designed to regulate trade activities regarding to intellectual property rights. From the perspective of trade protection, "Section 337" was a technical barrier to trade. It was to protect American companies from the damages ca used by the theft of intellectual property rights. Since its inception, "Section 337" has been revised many times and has now become an integral part of many intellectual property protection laws in the United States. The number of "Section 337 investigations" initiated by the United States against China peaked between 2010 and 2011, and then fell slightly. In recent three years, the number of investigations has remained at a high level. Among the 55 "Section 337 investigations" in

2018, 19 cases targeted at China.

Anti-dumping is a concept versus dumping. It refers to the countermeasures that one country imposes when other country dumping products in the international trade. The main methods include levying anti-dumping duties, etc.. Anti-dumping is a trade remedy that has been frequently applied under the WTO framework and is a important meaning for maintaining a fair trade environment. But it is undeniable that as protectionism rises, this policy is sometimes abused. From 2000 to 2018, the United States totally initiated 149 anti-dumping cases to China, accounting for 53.6% of remedy incidents during the same period. In 2007, the US trade deficit with China rose 10.4% to US$258.51 billion over 2006 and for the first time the US-China deficit exceeded 30% of the total of U.S. trade deficit. That was also a year that the number of US anti-dumping investigations against China increase to 12 from 4 in 2015, a growth of more than 200%. After the 2008 crisis, the US-China trade was hit by the financial down turn and growth was sluggish and even recorded a minus 10.2% in 2009. Correspondingly, the growth of the U.S. trade deficit with China also decelerated or even went down. The figure was US$268.04 billion in 2008, an increase of 3.7% over 2007, while it reached US$226.87 billion in 2009, a drop of 15. 4% over 2008. Despite the sharp fall in the amount of deficit, the U.S. trade deficit with China as a proportion of the total U.S. trade deficit was still rising. In 2008, this proportion was 32.1%, and in 2009 it reached 44.8%. That period thus recognized the most frequent and violent US remedies against China. After 2010, the growth of US anti-dumping investigations against China began to surge in 2016 after a steady period and, in 2018, it reached the highest point of nearly two decades.

According to WTO, subsidies are the acts of the governments or public institutions of member states benefit enterprises through direct or indirect cash payments or tax reduction, reduction or exemption of taxes and government purchases. As for the US government, subsidies are referred as the government's actions to finance enterprises through investments, loan guarantees, purchases at irregular prices, etc., so as to lower business costs or increase their benefits. Similarity can be found between above two definitions. The

US one is more specific in judging whether there are subsidies for imported goods. That is, the subsidy needs to be granted only to specific industries or companies that meet certain criteria and locate in certain regions. The industry or enterprise receiving the subsidy enjoys more preferential treatment than other general enterprises. From this point, the US definition is more detailed and comprehensive. During 2000-2018, the United States launched 82 countervailing cases against China, accounting for 29.5% of trade remedy incidents during the same period. Overall, the number of those anti-subsidy cases indicated two obvious upward trends in time. From 2005 to 2009, the number of countervailing investigations by the United States against China went up significantly, and peaked in 2009. In 2010, the number of declined sharply. It is possibly because that the outbreak of the US subprime mortgage crisis in 2008 imposed significantly impact on the global economy. Meantime, China, with its strong productivity, became the driving force of world's economic recovery. In order to alleviate the impact of the economic crisis and satisfy the domestic production and living demands, the United States had to temporarily loose its trade policy with China. After 2012, the countervailing investigations, after a period of steady rise, began to show rapid growth in 2015, and reached its peak in nearly two decades in 2018.

The legal basis of the safeguard measures was provided in the General Agreement on Tariffs and Trade 1994("1994 GATT"): when the member states in the agreement was severely harmed by the rapid increase in imports in a short period, they can take necessary restricts on those imports according to law. That provided flexibility to the member states' obligations such that they were exempted from obligations of WTO agreement under special situations. That can help the members not having to bear serious damage that could have been avoided. The objects of the special safeguard were the member states of WTO. The safeguard allowed member states to use the transitional safeguard mechanism for specific product protection to take restrictive safeguard measures against certain types of imported products from specific member states to protect their own industries. From 2001 to 2018, the US in total used 5 times of that safeguard measures against China, accounting for 1.8%, and 42 special safeguard measures, accounting for 15.11%.

Looking at the US-China trade friction, that confrontation has been increasingly intense with the Chinese economic boom of China the scaling up of the their trade imbalance, especially after China's accession to the WTO. It seriously affects the normal development of the bilateral trade and has restricted the development of Chinese enterprises. Due to the pressure by its interest groups, citing the trade imbalance, the US government uses various tariff and non-tariff barriers such as anti-dumping and countervailing duties to restrict Chinese goods from entering the US market.

6.5 PREDICTION OF DEVELOPMNET TREND OF SINO-US TRADE IMBALANCE

Based on the data of Sino-US import and export trade from 1983 to 2019, this thesis uses time series regression analysis method and Eviews8 to build the econometric model, that is, China's export to the US, China's import from the US and the Sino-US trade balance are fitted and predicted.

The theoretical equations of trend prediction are as follows:

$$Y1 = \alpha + \beta X \qquad (1)$$

$$Y2 = \alpha + \beta X \qquad (2)$$

Where Y1 represents China's exports to the US; X represents the time series in unit of year; Y2 represents China's imports from the US; is the intercept; is the coefficient of the time series and represents the direction and quantity of changes. Y1 and Y2 are respectively fitted by linear regression, and the results are as below:

Table 26: Regression Estimation Results of Y1 and X

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	140.4126	9.096843	15.43531	0.0000
C	-279462.0	18203.04	-15.35249	0.0000
R-squared	0.871912	Mean dependent var		1503.616
Adjusted R-squared	0.868252	S.D. dependent var		1627.691
S.E. of regression	590.8048	Akaike info criterion		15.65339
Sum squared resid	12216760	Schwarz criterion		15.74046
Log likelihood	-287.5877	Hannan-Quinn criter.		15.68409
F-statistic	238.2488	Durbin-Watson stat		0.153923
Prob(F-statistic)	0.000000			

Table 27: Regression Estimation Results of Y2 and X

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	47.53396	3.488098	13.62747	0.0000
C	-94563.29	6979.784	-13.54817	0.0000
R-squared	0.841419	Mean dependent var		552.1742
Adjusted R-squared	0.836889	S.D. dependent var		560.9185
S.E. of regression	226.5385	Akaike info criterion		13.73625
Sum squared resid	1796189.	Schwarz criterion		13.82332
Log likelihood	-252.1205	Hannan-Quinn criter.		13.76694
F-statistic	185.7080	Durbin-Watson stat		0.202736
Prob(F-statistic)	0.000000			

The analysis of the above regression results shows that the determination coefficient R-square of Y1 and X, Y2 and X are 0.871912 and 0.841419, respectively, and the goodness of fit is relatively high; the F statistics is 238.2488, and the corresponding P values are 0 and less than 0.05, indicating that the linear relationship among Y1, Y2 and X is significant. Further analysis of the estimation coefficient of X in the two models shows that in the regression of Y1 to X, the estimation coefficient is 140.4126, the P value of significance test is 0 and less than 0.05, suggesting that X exerts a significantly positive

impact on Y1; in the regression of Y2 to X, the estimation coefficient is 47.53396, and the P value of significance test is 0 and less than 0.05, indicating that X exerts a significantly positive impact on Y2. Because the values of the two regression models are positive, Sino-US trade will continue to develop in the future, and the estimation equations of the model are as below：

$$Y1 = -279462 + 140.4126 \times X \qquad (3)$$

$$Y2 = -94563.29 + 47.53396 \times X \qquad (4)$$

According to the above two regression models, this thesis predicts the trend of Sino-US trade, and on this basis, the variation trend of Sino-US trade balance is calculated (see Table 3). From 2020 to 2026, Sino-US trade will continue to grow, and China's trade surplus with the US will continue to exist and expand, and the volume will increase from 271.62 billion dollars in 2020 to 327.34 billion dollars in 2026.

Table 28: Prediction of 2020-2026 Sino-US Trade Balance

Unit：Billion

Year	Amount of exports	Amount of imports	China's trade surplus
2020	4171.5	1455.3	2716.2
2021	4311.9	1502.9	2809.0
2022	4452.3	1550.4	2901.9
2023	4592.7	1597.9	2994.8
2024	4733.1	1645.5	3087.6
2025	4873.5	1693.0	3180.5
2026	5013.9	1740.5	3273.4

Note: Calculated according to Equation 3 and 4.

In conclusion, the Sino-US bilateral trade volume will continue to increase for some time to come and benign interaction is still the mainstream of bilateral economic and trade relations between the two countries. However, with the continuous expansion of total Sino-US trade volume, the Sino-US trade balance will tend to decline in the medium and long term, which is mainly a response to the domestic political pressure in the US as well as an inevitable requirement for China's internal economic adjustment. China needs to

strive for long-term interests in the adjustment of internal and external balance. Of course, such adjustment is a dynamic equilibrium and a gradual process guided by policies and based on market mechanism, rather than arbitrarily taking radical measures to restrict normal trade contacts.

6.6 SUMMARY

China’s trade surplus with the United States has eased China’s domestic employment pressure, empowering China with sufficient foreign exchange reserves to import advanced international technology and technology, and provide China an opportunity to improve its industrial and export structure. In a addition, in the large surplus with the United States, China stands at the weaker side of the benefit distribution, which has also widened the economic gap between the two majors. China's excessive surplus has introduced uncertainty to its economic growth, and the continuous exploration of domestic resources also brings hidden dangers to its future economy. As China's foreign exchange reserves are dominated by U.S. dollars, the expansion of the US deficit will lead China's assets to shrink.

While the US trade deficit with China is widening, the US has sustained its economic growth, curbed inflation, and slowed the US’s resource depletion and maintained a good ecological environment. On the other side, the huge trade deficit with China is widening US income gap and increasing the pressure on the dollar depreciation. The operational risks of the US economy have also increased.

The US-China trade imbalance has directly led to the U.S. trade friction with China. That trade friction has been heating up since China’s accession to the WTO in 2001. In 2018, it has escalated into a bilateral trade war, which has brought uncertainty to those two economies and even the whole world.

According to this article, it is predicted that the trade imbalance between China and the United States will continue to expand in the short term, which has laid hidden dangers for

the trade frictions and economic frictions between China and the United States and even larger-scale confrontations.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 CHAPTER OVERVIEW

This chapter makes a summary of the results for this study, and based on the results, the chapter also puts forward recommendations to adjust the Sino-US trade imbalance for the governments and industry associations related to Sino-US trade. And there is a list of new findings of this study at the end of this chapter.

7.2 CONCLUSIONS

7.2.1 The Sino-US trade imbalance exists throughout all historical stages of Sino-US trade, which has become a prominent obstacle to Sino-US trade and political relations at the present stage.

In the early stages of Sino-US trade, despite the Sino-US trade relations was inevitably influenced by politics, generally it was completed based on mutual benefit. Since the trade between the United States and China was generally carried out based on mutual benefit; the direct trade between both countries developed rapidly, though it started relatively late. In spite of fluctuations during this period, the Sino-US trade generally maintained an upward trend. According to the above research results, the US trade volume with China also increased by six times in the 50 years from 1791 to 1841. Although China's overall foreign trade changed from surplus to deficit as the United States exported more and more opium to China, during this stage of Sino-US trade, China still ran surplus in most years. In

the following periods, the situation of Sino-US trade differed with the change of Sino-US relations.

Since the normalization of Sino-US trade, the balance of payments of Sino-US trade has gone through two distinct stages. At the first stage from 1979 to 1992, deficit existed in all years. The second stage has been in surplus since 1993, and the volume of favorable balance has been still increasing. From the establishment of diplomatic relations between China and the United States in 1979 to 1992, China ran a consecutive deficit for 14 years. It was mainly attributed to the trade policy of import-substitution trend during this period, and the restriction of import was actually the inhibition of export. On the other hand, China just implemented open-door to the outside world and was not familiar with the international market, and the international competitiveness of domestic enterprises was also weak, thus there remained a slight deficit during this period. However, the absolute volume of trade between China and the United States was relatively small during this period, so the deficit accounted for a large proportion of the trade volume, and it showed that the deficit reached a peak of 59% in 1980 according to the above research results. With the deepening of China's reform and opening up, especially when the goal of building a socialist market economy was established in 1992, China's foreign trade operation system has been gradually deregulated, stimulating the vitality of foreign trade. Meanwhile, the international competitiveness of Chinese products has been increasing, especially the competitive advantage of labor-intensive products, which has led to the rapid growth of China's exports to the United States. Since 1993, the balance of payments in Sino-US trade has reversed, and China has become a surplus country with the United States, and this trend is still enhancing. Based on the above research results, since 1993, the proportion that China's surplus with the United States accounted for in the trade volume has been gradually increasing, especially after China's accession to the WTO in 2001, the proportion exceeded 40%, it even exceeded 50% during the period from 2005 to 2007. Due to the impact of the financial turmoil, China's exports suffered a heavy blow after 2008. And as the labor cost rose with the appreciation of RMB and the increase of wages, which made the export of China's labor-intensive products worse, thus the growth rate of China's

surplus with the United States began to decline. Nevertheless, China's trade surplus with the United States reached $335.3 billion in 2017, making President Trump sign two executive orders on trade. Focus on the US trade deficit, it also directly led to the Sino-US trade war that began in 2018.

The trade imbalance between China and the United States is the most important obstacle to the development of Sino-US trade relations and also the focus of interest conflicts between the two sides, which is related to the differences between the two sides in exchange rate reform and market opening, etc. The trade imbalance is not only attributed to the US industrial transfer and economic development pattern, but also related to China's long-term development strategy of driving economic growth by investment and export. Properly dealing with the trade imbalance is the key to the normal development of Sino-US trade relations, which requires both sides to make joint and long-term efforts. The Sino-US trade imbalance has established a hidden danger for the trade war and confrontation in other fields, which directly led to the trade friction between the United States and China. The Sino-US trade friction has been heating up since China's accession to the WTO in 2001, and it has escalated into a trade war in 2018, which has brought uncertainties to the Chinese and US economies as well as the world economy. According to the prediction in this paper, the Sino-US trade imbalance will continue to enlarge in the short run, which lays a hidden danger for the trade war and economic friction between China and the United States and even confrontation in broader fields.

7.2.2 The high domestic national saving ratio in China is an important reason for the Sino-US trade imbalance.

The analysis results indicate that there is a co-integration relationship between the Sino-US trade surplus and the differences in exchange rate and national saving ratio between China

and the United States in the long run, which has a stable development trend. Specifically, the real exchange rate of RMB against US dollar has a significant negative impact on Sino-US trade surplus, indicating that Sino-US trade surplus has not decreased with the relative appreciation of RMB and the scale of Sino-US trade imbalance has been enlarging. The difference in national saving ratio between China and the United States plays a significant positive impact on the Sino-US trade surplus. That is to say, the larger the difference in national saving ratio between China and the United States, the larger China's trade surplus with the United States will be. The difference in saving ratio between China and the United States remains an important reason for the consecutive growth of China's trade surplus with the United States. Domestic national saving ratio in China remains too high, leading to massive savings surplus; China has accumulated a huge trade surplus during the Sino-US international trade, and in the absence of safer investment channels in the international market, China can only convert its huge trade surplus into US dollar assets mainly based on US Treasury bonds. In the meantime, high consumption in the United States can lead to import increase, while high savings in China can augment exports, thus resulting in a long-term trade imbalance between China and the United States, as well as the widening trade gap year by year between both countries.

7.2.3 Foreign direct investment in China aggravates the Sino-US trade imbalance.

The analysis results show that there is a one-way Granger causality between foreign direct investment in China and the volume of China's export to the United States when it remains below a significant level of 10%, indicating that the increase of foreign direct investment in China promotes the development of China's export trade to the United States, thus enlarging China's trade surplus with the United States. Such result indicates that the trade balance between China and the United States is substantially not only the problem of

Sino-US trade; it has become the problem of trade deficit transfer incurred by foreign direct investment in China. It can be said that foreign-invested enterprises in China has produced the imbalance of China's foreign trade. On the one hand, the increasingly expanding Sino-US trade surplus is actually the result of the trade surplus transfer of east Asian countries and regions with the United States. Foreign-owned enterprises have not only directly given rise to large trade surplus, but have also turned goods that China would otherwise have imported into goods that are produced and processed in China. Such two factors have contributed to the scale increase of the Sino-US trade imbalance. As the US direct investment in China enlarges, the trend of Sino-US trade imbalance is also likely to expand further. In the long term, with the further opening up in the Chinese market, as well as the expectation for the Chinese market from American enterprises and the copy effect of foreign investment, American multinational companies will increase direct investment in China, and make the investment in the Chinese market continuously develop in depth. Thereby, the indirect exports to China from American subsidiaries in China can be enlarged, and the direct exports to China from the United States can be decreased, leading to the further expansion of Sino-US trade imbalance.

7.2.4 Summary of other reasons for Sino-US trade imbalance

China's export-oriented trade policy has given rise to the long-standing Sino-US trade imbalance. Choice of national trade policy for both countries plays a significant effect on the direction and degree of Sino-US trade imbalance.

However, no matter the regulatory policy of US high-tech product export or China's export-oriented policy, they are both policies based on the interests of economic interests and national security, and such choice do advantages which outweigh disadvantages for their own, while for the principal trading partners, these policies promote the imbalance of trade between both sides and global economy. According to the factor endowment theory

from Heckscher-Ohlin, under the premise of free trade, the trade of commodities among countries is determined by their relative factor endowment, and a country or region participating in international trade tends to produce and export its relatively abundant-factor-intensive goods and import its relatively scarce-factor-intensive goods.

Thereby, under the premise of free trade and the different factor endowment, economic development and technological level in both countries, China should make use of its comparative advantage of low cost, including labor force and land, etc., and do specialized production and export of traditional labor-intensive products, while the US should produce and export capital or technology-intensive products. In fact, based on the real trade statistics above, this is not the case. From 2007 to 2018, China's exports to the US have been dominated by technology and capital-intensive products HS84-85(mechanical and electrical products), accounting for an average of 48.1%. While the proportion of mechanical and electrical products in China's imports from the US only reached 22.8% on average, showing a significant downward trend.

There are statistical differences in Sino-US trade.

The dispute over Sino-US trade statistics has been existed for a long time, and the discrepancy in statistics is one of the reasons for the aggravation of bilateral trade imbalance. There are statistical differences in pricing manner, transit trade, price raise in trade and service trade when both countries conduct trade statistics.

China adopts the mode of trade mainly focused on processing trade.

Processing trade is one of the main sources of China's foreign trade surplus. In China's export to the United States, the proportion of trading type is seriously unbalanced, and the mode of processing trade has always been dominant. Affected by economic globalization and global industrial transfer, China stays at the low and middle-end of the global industrial chain, which is an important processing plant for export in the world. With

China's enlarging opening up, the low and middle-end of manufacturing industries in the world are gradually transferring to China. As the most developed country, the United States not only has a large number of strong multinational companies, but also needs to eliminate or transfer backward sectors during industrial optimization and upgrading, thus China has become the appropriate choice for the US direct investment. By investing and establishing factories in China, the United States combines its technological advantages with cheap labor force in China, and produces and exports commodities to the world, thus it gains huge profits. During this process, part of the domestic demand for products in the United States was met by companies established in China, leading to an increase in the Sino-US trade imbalance to a certain extent.

7.2.5 Sino-US trade imbalance plays a certain impact on the trade development and economic relations between the two countries.

Most of the profits from China's growing trade surplus have actually been obtained by foreign businessmen.

China only applies labor force to simple assembly processing with supplied materials, but does not have core products and patented technologies, such as computer chips and chips for cell phone, which are in the control of developed countries like the United States. In the segmentation of product value, developed countries can gain most of the profits by means of authorization fees from intellectual property transfer, the expense of core product purchase, software expense for chip upgrade, etc., while China can only gain little value, including the employment income, rental income for land, tax revenue from foreign investment. Thus, from the perspective of export from foreign-funded enterprises, it is quite unfair for China's trade gains.

The analysis results indicate that China's export to the United States does enlarge the economic gap between both countries. When the export increases by 1 unit, the economic gap expands by 0.7144 units. Sino-US trade is a typical complementary trade, and China has an absolute advantage in labor-intensive products. Despite the bilateral trade is based on the absolute advantage, the absolute advantage is only a particular case of comparative advantage, thus there is a pattern of profit distribution between both countries, that is, the United States with an overall advantage gains more in bilateral trade. Although China gains a surplus, the profit distribution between both countries cannot be reflected only in the volume of surplus. The surplus represents only an increase in the money stock, but it fails to fully represent an increase in the material benefits or wealth of the two countries. Focusing only on increases and decreases in currency amount would be a reverse to the view of mercantilism. The transfer of resources and factors hidden behind commodity exchange and the transfer of labor consumption cannot be completely reflected in commodity exchange and its profit distribution, and the effect of profit distribution on the overall economic development of a country cannot be measured only from the money stock. There is excessively abundant labor in China, which leads to regressive competition, thus wages have been at a low level, and there is still a long way from the average wages in the United States after calculated at par by exchange rate and purchasing power. The United States occupies much cheap labor by importing China's primary commodities. Thus, in spite of China's growing surplus, the economic gap between China and the United States is also enlarging.

China's trade surplus with the United States, to a certain extent, alleviates the pressure of domestic employment in China, which makes China enabled to bring in international progressive technologies and processes with sufficient foreign exchange reserves, and provides an opportunity for China to improve its industrial structure and export product structure. Meanwhile, the sustainable exploitation of domestic resources in China has brought hidden dangers to the subsequent economic development. China's foreign exchange reserves are dominated by US dollars, and the shrinkage of China's assets will occur due to the deficit expansion of the United States.

The United States has maintained sustained economic growth and restrained inflation under the circumstances that the trade deficit with China is enlarging, and has slowed the resource depletion in the United States and kept its favorable ecological environment. In the meantime, during its huge trade deficit with China, the domestic income gap in the United States is enlarging, the pressure of dollar depreciation is increasing and the risks in economic operation of the United States are also increasing.

7.3 RECOMMENDATIONS

7.3.1 Reduction of national saving ratio in China

First, there is a generally high demand for precautionary savings among Chinese residents, particularly a higher demand in rural areas. The Chinese government also necessarily carries out a reform in the endowment insurance and medical insurance system and improves the endowment insurance and medical security system, so as to make both urban residents and rural residents covered by a variety of security and eventually make all Chinese residents benefit from it. Only when considerations that cause delay in decision are resolved, can Chinese residents be unafraid of consuming. Second, since China's reform and opening up in 1978, China has implemented export-oriented economic strategy, and when doing domestic production, external demand which means providing products for foreign consumers is taken into consideration, but not too much research and consideration of Chinese residents' propensity to consume, thus when the Chinese government promotes residents' consumption, full market research of consumer market in China is necessary for reasonable and effective guidance in promoting patterns of consumption and a guarantee for the healthy development of residents' consumption.

Eventually, China remains relatively backward in the financial market when it has made great achievements in the commodity market of market economy, and the underdeveloped financial market and few financial instruments have greatly constrained the financial liquidity, which not only limits the residents' consumption but also inhibits the effective transformation of savings to investment. Thereby, the Chinese government needs to further open the financial market and encourage financial innovation of residential mortgage loans and loans for consumption, etc., thus providing more effective financial support to improve the residents' consumption.

Reduce the Chinese government's savings.

The promotion of saving ratio for the Chinese government is mainly attributed to the increase in government fiscal revenue. Effective reduction of the government saving ratio can be achieved by increasing government consuming expending and investment expenditure. However, it is necessary to be alert to government repetitive investment, and investment in industries of high energy-consuming and high pollution must be prevented, while investment in education, health care, social security, high and new technology needs to be increased, and attention needs to be paid to the government long-term return on investment.

7.3.2 Standardization of foreign investment in China

China has been engaged in encouraging foreign investment in China, and has implemented a series of preferential policies to attract foreign investors. Furthermore, China possesses a broad market, abundant cheap labor force and ample natural resources, resulting in massive foreign investment that swarms into China in a large-scale. However, what cannot be neglected is that foreign direct investment in China is a double-edged sword, which not only promotes the trade between China and the United State and the rapid development of

China's economy, but also has a certain negative impact on Sino-US import and export trade and the development of China's economy. The scale expansion of foreign direct investment in China has not only provided China with a large number of trade surplus, among which the trade surplus with the United States is the most serious, but also brought in numerous industries of high pollution and high energy consumption. And these industries have not only failed to bring advanced technologies and managerial experience to China, but also caused severe damage to China's natural environment, making China lose more than it gains. Thus, China should further improve the laws and regulations on foreign direct investment in China, raise the admittance criterion for foreign direct investment in China and the environmental cost of foreign-funded enterprises. For instance, preferential policies for foreign direct investment in China could be appropriately reduced to prevent investors who only expect for preferential treatment but have potential damage to the environment. Next, China should not only pay attention to the volume of foreign direct investment in China, but also lay more emphasis on the quality and structure of foreign direct investment in China, encourage foreign investment in high-tech industries and modern service industries, and it is necessary for foreign businessmen to combine the introduction of foreign investment in China with the introduction of advanced technologies and managerial experience.

7.3.3 China shall seek international trade environment for reasonable interest distribution.

China remains at disadvantage in the profit distribution of Sino-UU trade. To obtain a reasonable distribution of profits in international trade, China can seek cooperation with different countries which have similar level of development but different economic structures and different demand preferences. When it comes to international trade in the case of a small gap in the rate of return on factors, the inequality will be much less. Otherwise, an organization of economic integration can be established, thus the

unreasonable distribution of profits can be restrained and resolved by the regime of integration. As long as transactions are nonequivalent, there will be inequality, whether within or between countries. If countries are combined into perfect economic integration, their internal requirements of economy and politics are bound to eliminate the gap and ensure fairness with the complete regime. The EU has done a good job in this. At present, there are developing countries such as Bulgaria among EU member states. For these developing countries, there is commitment to economic support from other state members, as well as assistance when necessary, and the prominent performance is attributed to the EU's cohesion policy. Thus, it is a guarantee for the equal development opportunity within the EU which can be gained by relatively backward countries.

7.3.4 China shall encourage enterprises to conduct technological innovation

It is necessary to perfect the laws and regulations related to intellectual property rights, strengthen the law enforcement of intellectual property rights, and create an environment for enterprises to conduct healthy competition. To promote the conversion from old to new power and the transformation of economic growth pattern, promoting the innovation capacity of the entire society is necessary. The enterprise is the subject that conducts technological innovation and transforms innovation into practice, it is necessary to strengthen the legal protection for intellectual property rights, increase the illegal cost, improve the power to conduct innovative research and development for enterprises, and put severe punishment on enterprises that do technology counterfeit and stealing, so as to guarantee the effect of law enforcement in intellectual property rights. The publicity and education of intellectual property protection should be strengthened to establish the consciousness of respecting and protecting intellectual property rights.

7.3.5 The US shall make full use of its comparative advantages to expand its export to China to a certain extent.

Expanding the scope of anti-dumping actions against Chinese goods is not fundamentally conducive to reducing imports trade for the United States, but also does damage to the interests of consumers in the United States. The US might as well try to decrease its trade deficit by increasing its exports to China. Secondly, based on the theory of comparative advantage, China tends to import high-tech products and technical patent. The United States should properly relax its control in this field, and make a proper increase in the export of such products without endangering national security. Since there is a huge value gap between such products and labor-intensive products, such as mechanical and electrical products, clothing and toys, etc., the increase of such kind of products is bound to effectively alleviate the trade deficit.

7.3.6 The US shall make a corresponding increase in savings

If tighter credit policies in the United States are implemented, some irrational and excessive consumption can be curbed to a large extent. Meanwhile, an increase in interest rate plays an effective way to stimulate household saving.

7.4 LIST OF NEW FINDINGS

1. I checked the trade volume and GDP between China and the United States. According to the economic model, I proved that China participated in the trade with the United States based on its comparative advantages. Although China can obtain certain trade benefits, the

economic gap with the United States cannot be narrowed.

2. I found that China-US trade has a tendency of mercantilism and is moving away from factor endowment theory. Through research and statistics on the trade structure between China and the United States, I found that technology-intensive and capital-intensive products in China's exports to the United States are increasing, and this is not in line with the factor endowment of China. The United States has formulated a series of restrictive measures on the export of high-tech products with its own comparative advantages to China, and has conducted frequent anti-dumping investigations against products from China. This reflects a certain tendency of mercantilism in trade between China and the United States.

3. I demonstrated some limitations of mercantilism theory. I checked China's exports to the United States and the gross domestic product of the United States, and established an economic model to prove that although the United States has a huge trade deficit in China-US trade, China-US trade is still conducive to the economic growth of the United States.

4. I made a comparison between savings and exchange rates, two factors that have always been discussed in academic circles and affect the imbalance of China-US trade. By establishing an economic model, I found that compared with exchange rate factors, the difference in the national savings rate between China and the United States has a significant positive impact on the China-US trade surplus.

5. I found that it is not enough to analyze the factors of China-US trade imbalance only by focusing on US direct investment in China. By establishing an economic model, I studied all the foreign direct investment in China, including the United States, and found that the increase of foreign direct investment in China has promoted the development of China's export trade to the United States, thus enlarging China's trade surplus with the United States.

6. I established an economic model to predict the trend of China-US trade imbalance in the short term, and found that the China-US trade imbalance will continue to expand in the short term.

7. By analyzing the history of China-US trade, I found that China-US trade imbalance runs through all historical stages of China-US trade. At present, China-US trade imbalance has become a prominent obstacle in China-US trade and political relations.

8. By analyzing the history of China-US trade disputes, I found that China-US trade imbalance is the direct cause of China-US trade disputes. The US side is the aggressor in trade disputes, and its trade protection measures are constantly escalating.

9. After analyzing the ways in which different US presidents deal with China-US trade disputes, I pointed out that there are great differences in the ways in which different US presidents handle trade disputes with China, and this is an uncertain factor for the stable development of China-US trade relations

10. I have put forward some suggestions to reduce the China-US trade imbalance, which will contribute to the development of trade relations between China and the United States.

BIBLIOGRAPHIC REFERENCE

[1] William R. Cline. Renminbi Undervaluation, China's Surplus and the US Trade Deficit [J].Policy Breifs, 2010(4), p.381-383

[2] David D. Hale, Lyric Hughes Hale. Reconsidering Revaluation: The Wrong Approach to the U.S.-Chinese Trade Imbalance [J].Foreign Affairs, 2008(1), p.57-66

[3] Allan Greenspan. Pricier Yuan Won't Help US Trade Deficit [N]. Xinhua News Agency, December 12, 2003

[4]Written by Liu Zunyi, translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019 Edition, p.3-4

[5]Written by Pan Xulun and translated by Li Husheng: The History of American Trade with China (1784-1923), Lixin Accounting Press, 2013 Edition, p. 4-6, p.10-11

[6]Liu Gang, Formation and Evolution of Early Sino-US Commercial Relations, Journal of Chongqing University Of Science & Technology, 2010, p.154.

[7] Liang Birong, a Brief View of the Characteristics of Early Sino-US Trade, Journal of Historical Science, 1985, p.105

[8]Written by Pan Xulun and translated by Li Husheng: The History of American Trade with China (1784-1923), Lixin Accounting Press, 2013 Edition, p.4-6, p.22

[9]Written by Pan Xulun and translated by Li Husheng: The History of American Trade with China (1784-1923), Lixin Accounting Press, 2013 Edition, p. 4-6, p.34-35

[10]Written by Pan Xulun and translated by Li Husheng: The History of American Trade with China (1784-1923), Lixin Accounting Press, 2013 Edition, p.4-6, p.53

[11] Zhou Shijian, History and Status of Sino-US Trade, Journal of University of International Business and Economics, 1989, p.29

[12]Huang Xiaoling, the Trade Partners of Main Foreign Economies of China, the University of International Business and Economics Press, 2005,p.19

[13] Huang Xiaoling, the Trade Partners of Main Foreign Economies of China, the University of International Business and Economics Press, 2005,p.191

[14] China Commerce Year Book 1984

[15]Written by Liu Zunyi, translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019, p.16

[16]Chen Shibiao, Talk about Sino-US Trade Agreement and Most-favored-nation Clause, International trade issues, 1979, p. 41-43

[17]Dong Wang, "U.S. China Trade: 1971-2012: Insights into the U.S-China relationship," The Asia-Pacific Journal, Val 11，Issue 24, No. 4, June 17, 2013, p.35

[18]Shen Guobing, The Focus and New Trends of Trade Frictions between the US and China, International Business Research，2019，p.7

[19] Trump steel tariffs: Trading partners threaten retaliation. BBC News., 2018, 03

[20] Ana Swanson. Trump's Trade War against China Is Officially Underway. The New York Times, 2018, 07

[21]Written by Liu Zunyi, translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019, p.3

[22] The Press Office of the Ministry of Commerce of the People's Republic of China, the spokesperson of the Ministry of Commerce made a statement on the official implementation of the tariff increase by the US. Www.mofcom.gov.cn,2019,05

[23]Ministry of Finance of the People's Republic of China, http://www.mof.gov.cn/index.htm,2019,05

[24]Written by Liu Zunyi, translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019, p. 3-4

[25] Written by Liu Zunyi, translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019, p. 4

[26] Written by Liu Zunyi and translated by Yu Jiang: The China-U.S. Trade War and Future Economic Relations, Chinese University of Hong Kong Press, 2019, p. 52

[27] Chen Dongqi, Strategies for Promoting the Relative Balance of Trade between China and the United States and the Prospect, Economic Affairs, 2007, p.4

[28] Zheng Guihuan, Shi Dexin, Wang Shouyang, Research on the Fluctuation of China's

Trade Balance, Science Press, October, 2006

[29] Johnson et al. History of the domestic and foreign commerce of the United States, p.37

[30] Laura LaHaye, "Mercantilism," The Concise Encyclopedia of Economics, 2008

[31] Samuelson, Robert J, China's Wrong Turn on Trade, Newsweek, 2007

[32] kanopiadmin, "Mercantilism: A Lesson for Our Times? Mises Institute., 2017,https://mises.org/library/mercantilism-lesson-our-times

[33] John J. McCusker, Mercantilism and the Economic History of the Early Modern Atlantic World, Cambridge UP, 2001

[34] Lin Song, A Reflection on the tendency of mercantilism in China's foreign trade [J], Commercial Times, 2006, p.43-44

[35] Hu Yuxin, A brief analysis of the mercantilist tendency in China's foreign trade: JL. Modern Business, 2009, p.102-103

[36] Xiao Mingming, The disadvantages of mercantilism and the adjustment of China's trade policy [J]. Economist, 2009, (4), p. 81-82

[37] Cheng Li, Reflection on some problems in China's economic and trade under the influence of mercantilism [J] Economist, 2009 (4), p.55-56

[38] Li Daokui, Li Danning, Sino-US trade surplus: what's the root cause? [J]. International Economic Review, 2006(5), p.15-18

[39] Marrewijk, Charles van, "absolute advantage" Department of Economics, Erasmus University Rotterdam: world economy. Princeton University Press, 2007

[40] "Absolute and comparative advantage" (PDF).International encyclopedia of the social sciences, 2nd edition p.1-2

[41] Harrington, James W. "International Trade Theory". Geography 349 Absolute advantage, University of Washington

[42] Adam Smith, Research on the Nature and Causes of National Wealth [M], Beijing: Commercial Press, 1997, p.345-349

[43] Ricardo. David, The Principles of Political Economy[M].London: John Murray，

1821(Third edition) ,p.356-520

[44] Olin.B, Interregional and International Trade [M].Cambridge: MA Harvard University Press, 1933, p.179-251

[45] P. A. Samuelson, International Trade and the Equalization of Factor Prices [J] Economic Journal 58 (230), 1948, p.163

[46] Avinash K. Dixit，Joseph E. Stieglitz, Monopolistic Competition and Optimum Product Diversity [J] the American Economic Review, 1977, p.297-308

[47] Helpman, Krugman, Trade policy and market structure [M]. Trans. Li Zenggang. Shanghai: Shanghai People's Publishing House, 2009, p.37-69

[48] David Dollar Edward N .Wolff .Competitiveness, Convergence, and International Specialization [M] Cambridge: the MIT Press, P47-90

[49] Davis D.R, Intra-industry trade: A Huckster-Ohlin-Ricardo approach [J]. Journal of International Economics, (3, 4), 1995, p.201-226

[50] Eihanan Helpman, the Mystery of Economic Growth [M], Trans. Wang Shihua, Wu Xiao. Beijing: China Renmin University Press, 2007, p.35-76.

[51] Usman A Qureshi Gary L French Joel Sailors Linder's Trade Thesis, a Further Examination [J].Southern Economic Journal, (1), 1980, p. 933-936

[52] International gold standard system, February, 2009

http://finance.ifeng.com/

[53] Hunt, Michael H. The World Transformed: 1945 to the present. New York, New York: Oxford University Press, 2004, p. 80

[54] Defrise, International payments Adjustment, China Finance Publishing House, Beijing, 1990

[55] Shen Guobing, A Research on Sino-US Trade Balance, China Financial & Economical Publishing House, May,2007

[56] Yang Zhengwei, China's foreign trade and economic growth [M], Version 1, Beijing: China Renmin University Press, 2006, p.367-382

[57] Du Houwen, Peng Zhiwen, The Nature, Causes and Impact of Sino-US Trade Balance

[J] .Journal of Shanxi University of Finance and Economics, (2),2007, p.12-17

[58] Fung K.C and Lawrence Lau, "The China-United States Bilateral Trade Balance: How Big Is It Really" The Economic Journal, volume 38, 1998

[59] Fung K.C and Lawrence Lau Balances", Journal of Japanese “New Estimated of US-China Bilateral Trade and International Economics 141(1), 2001

[60] Fung,k.c,Lau,L.J, Adjusted Estimates tradebalances: 1995-2002, journal of Asian of United States-China bilateral economic (14), 2003, p.489-496

[61] Fung K C，Lau J，Yanyan Xiong, Adjusted Estimates of US-China Bilateral Trade Balances-An Update[J]，Working Paper,2006,p.278

[62] Huang ChaoDong and Simon Broadbent, "Trade Up". The American Economic review 107, China: Do the figures add, 1998

[63] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance, Economic Research, No. 6, 2005,p.25-31

[64] Yuan Lingling, Policy Choices to Cope with China-US Trade Imbalance [J] .Economic and Management Research, (3),2005, p.70-73

[65] Xue Rongjiu, Jia Huaiqin, Zhao Yuhui, Economic globalization and statistical problem of the place of origin-discussion on the statistical differences of Sino-US trade [J]. Journal of International Trade, 7, 1998, p.7-15

[66] Fung K.C., Lau L.J... The China-US Bilateral Trade Balance: How Big Is It Really? [J].Pacific Economic Review, 2(1), 1998, p.33-47

[67] Fung K. C., Lau L.J, New Estimates of the United States-China Bilateral Trade Balances [J].Journal of the Japanese and International Economies, 15(1), 2001, p.102-310

[68] Fung K.1995-2002[J].C. Lau L.J. Adjusted Estimates of US-China bilateral trade balance: Journal of Asian Economics, 2003, 14(3), p.489-496

[69] Huang ChaoDong and Simon Broadbent, "Trade Up". The American Economic review 107, China: Do the figures add, 1998

[70] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[71] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[72] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[73] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[74] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[75] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, (6), 2005, p.82-93

[76] Fung,k.c. Lau,L.J, The United States-China bilateral trade balance: How big is it really? Pacific Economic Review, 12(3), 1998, p.33-47

[77] Fung,k.c,Lau,L.J, Adjusted Estimates tradebalances:1995-2002, journal of Asian of United States-China bilateral economic (14),2003,p.489-496

[78] Shen Guobing, Differences in trade statistics and the issue of Sino-US trade balance [J]. Economic Research, No. 6, 2005, p.25-31

[79] Shen Guobing, Trade Statistics Difference and Sino-US Trade Balance, Economy Research, the 6th, 2005, p.25-31

[80] Shen Guobing, Trade Statistics Difference and Sino-US Trade Balance, Economy Research, the 6th, 2005,p.25-31

[81] Yin Xiangshuo, The US Trade Deficit Entered into New Economy Stage-Review of the Sino-US Trade Imbalance, the Global Economic Research, and Phase 2,2001, p. 48-53

[82] Xue Rongjiu, Jia Huaiqin, Zhao Yuhui, Xu Jinliang, Economic globalization and origin statistics-Review of Statistical differences in trade between China and the United States, International Trade Issues, phase 7, 1998,p.36-45

[83] Li Yuefen, China wants to establish a trade balance statistics system based on ownership, International economic review, 2006, phase 1

[84] Wan Guangcai, Ownership Principal, FDI Gains and Sino-US Trade Gap, Study on

Finance and Trade. Phase 4, 2009, p. 34-36

[85] James R. Melvin, Trade in Producer Services: A Heckscher-Ohlin Approach [J]. The Journal of Political Economy, 97(5), 1989, p. 1180-1196

[86] Lin Yifu, Tidal surge and the reconstruction of macroeconomic theory in developing countries, [J].Economy Study, (1), 2007, p.126-131

[87] Zhou Shijian, Wang Lijun, Sino-US economic and trade relations have been progressing rapidly amid frictions [J].international issues, (12), 2005, p.9-13

[88] Morris Goldstein and Nicholas Lardy, China's Exchange Rate Policy Dilemma [J] (5), 2006, p.422-426

[89] Chou W.L, Exchange Rate Variability and China's Exports [J] .Journal of Comparative Economics, (3), 2000, p.61-79

[90] Zhang Shuguang, RMB Exchange Rate Issues: appreciation and the cost-income analysis [J].Economy Research, (5), 2005, p.17-30

[91] Lu Xiangqian, Dai Guoqiang, The effect of RMB real exchange rate fluctuation on China's import and export: 1994-2003 [J].Economy Research, (5), 2005, p.31-39

[92] Zhang Shuguang, RMB Exchange Rate Issues: appreciation and the cost-income analysis [J].Economy Research, (5), 2005, p.17-30

[93] Qu Xiaosheng, Study on the relationship between the US trade deficit with China and RMB exchange rate[J].Journal of south China university of technology(Social science edition), (8),2006,p.38-40

[94] Li Daokui, Li Danning, Sino-US trade surplus: What's the root cause? [J].International economic review, (5), 2006, p.15-18

[95] Gao Wenjuan, Empirical analysis on the correlation between Sino-U.S. trade surplus and RMB exchange rate-Based on monthly data from 2005 to 2008 [J] Journal of Guang Xi University of economics and management, (4), 2009, p.106-111

[96] Yu Senjie, Will a stronger Yuan help reduce China's trade surplus with the U.S.?-Theoretical and empirical research based on gravity model[J]，Discussion paper series, China center for economic research, Peking University 10-08,2010

[97] Lin Feiting, A literature review on the dispute over trade imbalance between China and the United States [J].International trade issues, (5), 2007, p.41-46

[98] Swedenborg B, Determinants and Effects of MNC Growth: The Swedish Case Revisited M. Blomstrom M., Goldberg L.S.Eds， Topics. In Empirical International Economics Chicago: University of Chicago Press, 2000, p.33-53

[99] Liu Yang, Trade imbalance between China and the United States in the context of economic globalization, Economic research guide, and phase 6, 2007, p.178-180

[100] Xu Peiyuan, Hu Ridong, A study on china-us trade imbalance and its correlation with us investment in China .The Asia-pacific economic, phase 1, 2008, p.18-23

[101] Nicholas Lardy, China in the World Economy, Washington D C: Institute for International Studies, 1994

[102] Gaulier, Lemoine, Kesenci, China's Integration in East Asia: Production Sharing, FDI & High-Tech Trade. CEPII's Working Pacers, 2009

[103] Yin Xiangshuo, Wang Ling, East Asian factors in the Sino-US trade imbalance, The Asia-pacific economic, phase 1, 2004,p.33-37

[104] Cho, Koo, The Trade Imbalance between the United States and China: The Role of Exchange Rate and Trade Liberalization, Agribusiness Applied Economics Report, 548, 2004, p. 1-26

[105] Kang Meiling, Cause analysis of Sino-U.S. trade imbalance].World economic research, (4), 2006, p.6-12

[106] Zhao Fang, Feng Xiaoling, The trade imbalance between China and the United States is seen from the internal economic imbalance and industrial transfer[[J]， World economic and political forum, (3),2006,p.17-23

[107] Charles Kindleberger, The World in Depression, 1929-1939 [M], and Berkley, California: University of California Press, 1973:292; Dominance and Leadership in the International economy: Exploitation, Public Goods, and Free Riders [J].international Studies Quarterly, Vol.25, (2), 1981, p.247

[108] Mayer, W. Endogenous Tariff Formation [J], American Economic Review, (74), 1984,

p.970-985

[109] Grossman C. and Helpman E, Protection for Sale, American Economic Review, (84), 1994, p.833-850

[110] [US] G. M.Grossmann，E. Elhanan Helpman，translated by Li Zenggang, Interest groups and trade policy[M]．Beijing：Renmin university of China press,2005, p.201

[111] [US] Deisler, American trade politics[M]．Beijing：China market press, 2006

[112] Sheng Bin, Political and economic analysis of China's foreign trade policy[M]．Shanghai：Shanghai sanlian bookstore，Shanghai people's publishing house ,2002

[113] Liang Bibo, The balancing mechanism of U.S. trade policy decisions with China [M]．Beijing：China social sciences press, 2006

[114] Zhang Jimin, Analysis of the factors determining the us trade policy towards China[D]．Doctoral dissertation，Shanghai academy of social sciences,2007

[115] Wang Yong, Sino-US economic and trade relations[M]．Beijing：China market press, 2007

[116] Wang Xiaosong, The decision-making mechanism and forming factors of US trade policy towards China[D]．Doctoral dissertation，Nankai university,2011

[117] Zhu Hongyuan, Application Guide of Writing Theses and Dissertations, 1999, p.182

[118] Manfred Max Bergman, Advances in Mixed Methods Research Theories and Applications, Los Angeles, 2008

https://www.docdroid.net/VYJ4ZOX/advances-in-mixed-methods-research-manfred-max-bergman-2008-pdf#page=5

[119] Wang Yumin, Principles of social sciences research methods, 1994, p.247

[120] Zhou Changhui, The Use of Secondary data in the research of organizational management, empirical method of organizational and management research [M], edited by Chen Xiaoping, Xu Shuying and Fan Jingli, Beijing: Peking University Press, June,2008

[121] Dan Li, Stewart R. Miller, Lorraine Eden, Enter mode imitation by emerging market firms entering developed markets, Work paper, 2006,p.10

[122] Nicholas Gregory "Greg" Mankiw Macroeconomics (Fifth Edition) Published by Renmin University of China 2005, p.110-121

[123] Chen Chuanxing, Gao Tingting, Analysis of the impact of savings investment difference on China's trade imbalance [J] Shanghai management science (03),2012, p.26

[124] Federal Reserve Date Base https://www.federalreserve.gov/data.htm

[125] Website of China Statistics Bureau
http://www.gov.cn/xinwen/2020-01/17/content_5470113.htm

[126] Wei Yahua, Consumption is the accelerator of China's economy. The eyes of the whole world are on China's consumer market [J]. Property rights guide, 2013, p1

[127] Zhan J, empirical analysis of the impact of RMB real exchange rate fluctuation on Sino US trade balance, Xiamen University, 2009

[128] China Statistical Yearbook http://www.stats.gov.cn/tjsj/ndsj/

[129] National report of the Ministry of Commerce of China

https://countryreport.mofcom.gov.cn/

[130] Chu Jianying, A study on the causes of trade imbalance between China and the United States, Journal of north economy and trade,2007,p.10

http://www.cqvip.com/qk/96439a/200710/25565086.html

[131] Wind database https://www.wind.com.cn/en/edb.html

[132] Zhu Lingjian, A Study on the Reason of the Prosperity of American Interest Groups, Journal of Henan Normal University (PHILOSOPHY AND SOCIAL SCIENCES EDITION), (1), 2003

[133] Ministry of Commerce of China

http://english.mofcom.gov.cn/

[134] China Foreign Economic Statistics Yearbook

http://tongji.cnki.net/kns55/navi/HomePage.aspx?id=N2006090328&name=YDWJJ&floor=1

[135] China commerce yearbook

http://www.yearbook.org.cn/

[136] US Department of commerce website

https://www.commerce.gov/

[137] Yang Rudai, Hong Kong's entrepot trade and its impact on the trade balance between China and the United States, economic science,2008,p. 2

[138] Deng Zhongliang, Sino US trade frictions from the perspective of Sino US trade structure. China Journal of circulation economy, (10), 2018, p.80-92

[139] Sheng Songcheng, A comprehensive view of China US trade deficit from the perspective of trade in goods and services; financial times, April 9, (4), 2018

[140] Xu Xianchun, A comprehensive and objective understanding of the trade imbalance between China and the United States;"China's economic growth and cycle (2018)" Summit Forum, 2018

[141] China Customs statistical yearbook

http://tongji.cnki.net/kns55/Navi/HomePage.aspx?id=N2013040099&name

[142] US Bureau of Economic Analysis website

https://www.bea.gov/

[143] Mundell R A, International trade and factor mobility [J], American Economic Review, 47, (3), 1957, p.321-335

[144] Kiyoshi kojima, the "flying geese" model of Asian economic development: origin, theoretical extensions, and regional policy implications. [J] .Journal of Asian Economics 11, 2000, p.375-401

[145] Lipsey, R.E, Weiss, M.Y. Foreign production and exports in manufacturing industries [J], Review of Economics and Statistics, 1981,p.63 p.488-494

[146] Lipsey, R.E, Weiss, M.Y, Foreign production and exports of individual firms [J].Review of Economics and Statistics, 1984

[147]Blonigen Bruce A, In Search of Substitution between Foreign Production and Exports[J].Journal of International Economics，(53),2001,p.81-104

[148] Wang Hongliang, Xu Xia, A Study on the Relationship between Japan's Trade with China and the Direct Investment, World Economy, (8), 2003

[149] Horstmann, and J.R.Markusen, Strategic investments and the development of multinationals [J].International Economic Review, 28, 1987, p.109-121

[150] Zhu Caihua, Sino-US Mutual Direct Investment: Current Situation, Obstacles and Policy Recommendations [J], International Economic Cooperation, (2), 2010, p.4-12.

[151] Fu Qiang, Zhu Zhuying, the Influence of American Direct Investment in China on Sino-Us Trade Imbalance [J] International Trade Issues, 7, 2008,p.77-81.

[152] Chen Jiyong, Liu Wei, A Study on the Issue of "Foreign Capital-Led Deficit" in US-China Trade [J] World Economy, (9), 2006

[153] Fu Qiang, Zhu Zhuying, the Influence of US Direct Investment in China on Sino-US Trade Imbalance [J], International Trade Issues, (7),2008

[154] Zhao Beiwen, the Impact of FDI on US-China Trade Deficit in the Context of Trade and Investment Integration: Theoretical Analysis and Empirical Test [J]. International Trade Issues, (10), 2009

[155] Tian Yinhua, Zhu Wenwei, A Co-integration Analysis on the Impact of American Direct Investment on Sino-US Trade [J] Contemporary Finance & Economics, (10),2005

[156] BURKE J U, Investment in China worse trade deficit: U. S. firms Build export-oriented production base in China's low-wage, low labor-protection economy (DB /OL). (05), 2000

[157] Lirn, Sung Hoon, Moon Hwy-Chang, Effects of Outward Foreign Direct Investment on Home Country Exports; The Case of Korean Firms [J].Multinational Business Review, (spring), 2001,p.11-17

[158] Xiaming Liu, Chengang Wang, Yingqi Wei, Causal Links between Foreign Direct Investment and Trade in China [J] China Economic Review, (12),2001,p.190-202.

[159] Website of China Statistics Bureau

http://www.gov.cn/xinwen/2020-01/17/content_5470113.htm

[160] Wind- Economic Database

https://www.wind.com.cn/NewSite/edb.html

[161] Zhao Wen, the Impact of Sino-US Trade Frictions on China's Employment and Countermeasures, International Trade, No.8, 2020

DOI:10.14114/j.cnki.itrade.2020.08.004

[162] Heckscher, Eli F, The Effect of Foreign Trade on the distribution of Income, in Harry Flam and M. June Flanders, Heckscher-Ohlin Trade Theory, MIT Press,1919, p.48

[163] Lewis, W, Arthur, the Theory of Economic Growth, and Homewood, IL: Richard D. Irwin, 1955, p.235

[164] Ma Yeqing, Zang Erzhen, International Trade [M] Beijing: People's Publishing House, 2007, p.29

[165] Cai Xiao, Is China a real winner in Sino-Us Trade, An Authenticity Analysis of the so-called ‘China's Huge Trade Surplus’, Business Economics, 2006, p.5

[166] Liu Guangxi, Chen Wengang, The Biggest Beneficiaries of Sino-Us Trade Imbalance: American Enterprises and Consumers, International Trade, 2006, p.7

[167] Lin Ling, Duan Shide, Research on the Distribution of Trade Interests Sino-Us Trade in the Context of Economic Globalization, World Economic and Political Forum,2008, p.5

[168] Kahn Joseph, In China, Talk of Democracy is simply that. New York Times, 2007

[169] Bergsten, C. Fred, Gill Bates, Lardy, Nicholas R and Mitchell Perck J, China: The Balance Sheet. Institute for International Economics and Center for Strategic and International Studies, 2006

[170] Oxford Economics and the Signal Group, the China Effect: Assessing the Impaction the US Economy of Trade and Investment with China. January, 2006

[171] Elwell Craig K, Labonte Marc and Morrison M, Is China a Threat to the U.S. Economy? CRS Report for Congress, Order Code RL 33604 http: //www. fas. Org/ sgp/ crs/ row/ RL33604.pdf, 2007

[172] Zhang Erzhen, Dai Xiang, Theoretical Consideration of Sino-US Trade Friction, Journal of South China Normal University (Social Science Edition), (2), 2019,p.62-70

[173] Wang Lan, Sheng Bin, Benefits of Sino-US Trade in Value-Added and Bilateral Trade in the Context of Global Value Chain Division, Journal of Finance and Economics, (9), 2014,p.97-108

[174] Zheng Danqing, Yu Jinping, Secondary Decomposition of Bilateral Trade Benefits from the Perspective of Trade in Value-Added--A Case Study of Sino-US Trade [J] World Economic Studies, (5), 2016,p.52-63

[175] Xiong Zhenqin, Fan Yameng, Secondary Decomposition of Sino-US Trade Benefits from the Perspective of Trade in Value-Added [J], Asia-pacific Economic Review, (2), 2017, p. 65-70

[176] Zhao Chunming, Research on The Distribution of Sino-US Trade Benefits – Based on the Perspective of Marxism [J], International Trade, (11), 2018,p.4-9

[177] Zheng Danqing, Yu Jinping, Secondary Decomposition of Bilateral Trade Benefits from the Perspective of Trade in Value-Added -- A Case Study of Sino-US Trade [J]. World Economic Studies, 2016, p.5

[178] Wang Xinkui, Benefits Distribution in International Trade and International Investment, [M] Shanghai: Shanghai People's Publishing House, 1995, p.6

[179] Zeng Zheng, Zhang Lulu, The Definition of Sino-US Trade Benefits Distribution under the Global Production Network System -- A Study based on China's Manufacturing Trade in Value-Added [J]. World Economic Studies, (1), 2008, p.36-44

[180] Liu Jianjiang, Yang Xizhen, Research on Trade Interests in Sino-US Trade Imbalance from the perspective of Intra-Production Specialization [J]. Journal of International Trade, (8), 2011, p.68-80

[181] Paul A Samuelson, Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization [J].Journal of Economic Perspectives, 2004, 18(3)

[182]Website of China Statistics Bureau

http://www.gov.cn/xinwen/2020-01/17/content_5470113.htm

[183] Wind- Economic Database

https://www.wind.com.cn/NewSite/edb.html

[184] Hu Fang, Peng Cheng, A model of international trade friction caused by technological progress [J] International trade issues, (09),2009,p.61-67.

[185] China Trade Remedies Information

https://cacs.mofcom.gov.cn/index.shtml

[186] Website of China Statistics Bureau

http://www.gov.cn/xinwen/2020-01/17/content_5470113.htm

LIST OF PUBLICATIONS

[1] Jiandong Shi. The Sky Won't Fall – The China–U.S. Trade War and Future Economic Relations, Financial and Economic Review, Vol. 19 Issue 1, 2020.

[2] Jiandong Shi. The correlation of savings and exchange rate with China-US trade imbalance, Economics & Working Capital, Special issues, 2020.

[3] Jiandong Shi. Foreign Direct Investment in China and Sino-US Trade Imbalance, Polgári Szemle, 2021

[4] Jiandong Shi. The Impact of Sino-US Trade Imbalance on the US Economy and the Trend Prediction of Sino-US Trade Imbalance, European Mirror,2021.

[5] Jiandong Shi. Sino-US Trade Imbalance and Sino-US Economic Gap, Journal of Economy & Society, 2021.

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Professional Experience

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Conferences and Presentation

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[6]29-30th of November 2018, Trade Dependence and Complementary of China and central and Eastern European countries, Economic Turmoil in Contemporary Europe III Conference, Lazarski University, Warsaw, Poland

[7] 6-7th of December 2018, Case Study on Sino-US Trade Friction-Sino-US Photovoltaic Dispute, The Smart Cities Conference-6th Edition, National University of Political Studies and Public Administration，Bucharest, Romania

[8]18th February 2019, China-Hungary Economic and Trade Cooperation Zone, The Conference of the Past and the Future of Hungary's Diplomatic and Trade Relations with East Asia ,Oriental Business and Innovation Centre of Budapest Business

School-University of Applied Sciences. Hungary

[9]8 April 2019, Analysis on Factors of Statistical Difference of Sino-US Trade Imbalance, International Scientific Conference on Sustainability 2019, Budapest Business School-University of Applied Sciences, Hungary

[10] 3-5th May 2019, Analysis on Chinese factors of Sino-US Trade Imbalance, XII. Tavaszi Szél Conference, National Association of Doctoral Students, University of Debrecen, Hungary

[11] 15 May 2019, Research on factors behind China for China's trade surplus with the United States, Critical Rethinking of Public Administration Conference 2019, National University of Public Service, Hungary

[12] 24th-25th of May 2019, Sino-US Trade Imbalance, 8th Interdisciplinary Doctoral Conference, University of Pécs, Hungary