

**The Application of Risk Management  
in Processing Trade Supervision of China Customs**

**by**

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## Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

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## **Abstract**

This study establishes an initial understanding of the application of risk management in processing trade supervision of China Customs. Two specific objectives are fulfilled; (a) to find and analyze the risk of processing trade supervision from customs point of view, and (b) to establish an early-warning mechanism to manage the risk of customs supervision in the intermediate period of processing trade activities.

Processing trade constitutes a high proportion in foreign trade in China. Since processing trade activity has closely relationship with tax revenue and customs supervision, customs supervision of processing trade is really important for the prevention of tax fraud and prevention of smuggling activities.

A literature review identifies the current state of processing trade in China and the main risk of processing trade supervision. Smuggling case analysis, interview to customs officials and questionnaire to processing trade companies identify the main problems of processing trade supervision in intermediate period in recent years and how these problems shows up.

The results indicate that the main risk in processing trade supervision is the unfeasibility of customs real time monitoring to processing trade companies, which include: 1. customs real time monitoring to the business condition of processing trade

companies cannot be conducted; 2. customs real time monitoring to the inventory condition of processing trade companies cannot be conducted.

Based on the research findings, this paper establishes an early-warning mechanism using financial analysis, which is composed of business trend analysis and business detail analysis. This early-warning mechanism is highly expected to act on the business condition of processing trade companies, and the results of test to the validation for this early-warning mechanism show that it is workable.



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## **CHAPTER 1**

### **Research Background**

This chapter describes the development of processing trade in China and current risk of processing trade supervision from customs point of view. As mentioned in the abstract, the purpose of this research is to establish an initial understanding of the application of risk management in processing trade supervision of China customs. Based on the analysis, the research is expected to establish an early-warning mechanism to manage the risk of customs supervision in the intermediate period of processing trade activities.

#### **1.1.1 Development of Processing Trade**

Because the processing trade is based on the operation of the storage, processing and assembling and related to customs' supervision policies and tax preference from the very beginning, whenever the processing trade is discussed either from academic point of view or from government supervision point of view, processing trade is such kind of trade supervised by customs and recorded especially. Also we can see in this sense that customs processing trade supervision is the key characteristic of processing trade activities. In order to enlarge foreign trade and attract foreign merchant investment in the condition of high tariff restrictions and non-tariff barriers, the materials imported in the form of customer's processed materials or imported

processed materials are supervised by the customs in the way of bonded supervision in China.

According to “Administer Method of Processing Trade Approval and Administration” issued by General Administration of China Customs, processing trade is such kind of activities which companies import the whole or part of materials, components and parts and wrapping materials in the way of processing trade and export the products made by the materials imported after processing and assembling in China.

Processing trade activities are composed of operation of customer’s processed materials and operation of imported processed materials. Operation of customer’s processed materials is that foreign customer provides materials, components and parts and wrapping materials to Chinese company, ask Chinese company to proceed according to the required format, quantity and technical standard and pay for Chinese company the processing fees. The foreign customer sells the products itself.

Sometimes foreign customer provides not only materials, components and parts and wrapping materials but also machines, instruments, tools, moulds and packing equipments, whose price will be deducted from the processing fees. It is quite common that the foreign trade department of China makes processing or assembling contracts with foreign customers and transfers to Chinese companies like a trade agent.

Operation of imported processed materials is that Chinese company imports materials, components and parts and wrapping materials according to its plan or the market

demanding and exports the products to foreign customers. The price difference between exported products and imported materials, components and parts and wrapping materials, is the profit. Operation of imported processed materials started in China during the development process of operation of customer's processed materials and foreign investment. According to "Provision of Encouraging Foreign Investment" (General Customs Administration, 1986) and "Administer Method of Import, Export and Taxation of Foreign Investment Enterprises" (General Customs Administration, 1992), the subject of operation of imported processed materials is foreign investment enterprises.

Since 1970s, export processing zones has become popular all over the world. Actually export processing zones have many advantages which could give full play to labor, land and resources advantage, such as good infrastructure, preferential policy and advanced management experience and so on. Asia's "four little dragons", which were Singapore, Korea, Hong Kong and Taiwan, and the developing countries in South America and Africa were attracting foreign investment by taking the advantage of their labor markets. Setting up many export processing zones was the main method to develop foreign trade in these countries. Till the World Processing and Export Conference at Manila in March 1978 there were 33 countries and districts who have export processing zones. Moreover some developed countries also established export processing zones to attract foreign investment and develop poor areas.

Since this kind of processing model was suitable to developing countries at that time, China also started to develop processing trade referring to other countries' experience and combine with self-practical condition. Processing trade grew up rapidly since 1980s in China. The export money amount of processing trade was 1.6 billion dollars in 1981 and increased by 19.8 billion dollars in 1989 (Bin Bai, 2004). The growth speed was nearly 45% annually which was much bigger than the growth speed of total export money amount. The proportion of processing trade export is increasing because of the development of processing trade. Now the processing trade becomes one of the most important foreign trade methods. The development mentioned above can be proved by the following figures: The import money amount of processing trade was 6.7 billion dollars and the export money amount of processing trade was 0.62 billion dollars in 1986. However these two figures were 93.97 billion dollars and 147.43 billion dollars in 2001, which increased 14 times and 26.2 times comparing with 1986's (General Customs Administration, 2001). In the year 1986 processing trade import accounted for 15.6% of total national import and processing trade export accounted for 18.2% of total national export. However these two figures increased to 41.4% and 55.3% in 2002 (Bin Bai, 2004).

Processing trade centralizes in eastern of China at present, especially in Guangdong province and Fujian province. Comparing with the development of processing trade in other area of China, processing trade in the eastern of China has many advantages for capital, human resource, technology and management. Even though being dominant

in China processing trade, the processing trade in the eastern part of China started upgrading of an industry structure. Now the added value and technology of processing trade products in the eastern part of China is increasing which promotes the development of infrastructure, logistic, communication and finance. Because of the development of processing trade, the supporting industries grow rapidly. However, in the other area of China, the development of processing trade is still quite low because of the natural condition and poor economics. Even comparing the scale of single processing trade activity, processing trade activity in the eastern part of China is much bigger than in other area. In the year 2002, the proportion of processing trade in Sichuan province, where the processing trade has the highest growth in the middle part and the western part of China, was only 1/96 of the proportion of processing trade in Guangdong province. The growth of processing trade in middle and western of China is so slow that in some area the processing trade has negative growth.

At early stage, textiles, clothing, toys and shoes and hats were the main processing trade products. Because more and more foreign investor came into China to do processing trade, the percentage of mechanical and electrical products in all the processing trade products was increasing. In 1995 the export amount of mechanical and electrical products exceeded the export amount of textiles and became the No. one export product. In 2001, the money amount of processing trade export of mechanical and electrical was 88.27 billion dollars, which took 60% of the total money amount of processing trade export in that year and 74.3% of the total export of

mechanical and electrical products (General Customs Administration, 2001). The export of computer, communication equipment and audio-video equipment is quite important in all the processing trade export, which could not only improve the grade of China's export products but also change the product mix greatly.

65% of processing trade imports in China are from the neighboring countries and areas, such as Japan, Taiwan, Association of South East Asian Nations and Korea. Chinese main processing trade products are exported to America, Japan and Europe, which aggregate to 56.2% of total China's processing trade export. China has a huge market with big potential and wide prospect. There are abundant labor resource, low-cost land and series of preferential processing trade policies to encourage the processing trade export issued by the government, that's why China become the best place to transfer the labor-intensive industries of the mentioned countries. However unitary trade partners extensively affected the economics and foreign trade of related areas and industries. America and EU initiated many anti-dumping investigations to China concerning household electrical appliances, clothing and chemical products and so on, which caused many trade frictions between the mentioned countries and China. And meanwhile because of the unique feature of processing trade, the huge amount import of cheap materials deeply preclude the development of relative domestic industry, such as cotton planting, textile, oil industry and metal industry.

### **1.1.2 Current Risk of Processing Trade Supervision**

Because of the unique feature of tax free, most of the smuggling activities are against processing trade activities and it seems to become more and more popular though the customs is placing more important on processing trade supervision. With the development of processing trade activities in recent years, the number of type and money amount of processing trade activities increased a lot. Meanwhile, processing trade activities are becoming more and more diversify and complex. Compared with the diversity and complexity of processing trade activities, resources of customs processing trade supervision are quite limited which make the customs processing trade supervision become risky.

First of all, customs supervision of deeper processing activities is becoming more and more risky. According to the statistics from 2003 to 2005, the total money amount of import and export of deeper processing transferring in Guangzhou customs rose by 12.5%, 26.6% and 16.6% respectively. With the increase of deeper processing transferring, supervision risk of deeper processing transferring was increasing. In the recent 3 years, the smuggling cases clamped down on deeper processing transferring take the percentage of more than 50% in all the smuggling cases clamped. Customs supervision in deeper processing is still poor even now.

Second, unpriced equipment supervision is becoming critical. Processing trade



companies take 60%-70% of all the companies doing foreign trade in Guangzhou customs. The lack of supervision resources and old pattern of supervision leave a gap for the smuggling activities. More and more smuggling activities of unpriced equipment were clamped down and appropriating, sell, transferring, lower price quoting were quite popular in smuggling activities of unpriced equipment. It seems that improving customs supervision of unpriced equipment is quite emergent.

The third risk, which always exists, is the unit cost management. According to the principle of unit cost management and “Customs Law”, customs’ unit cost management should be based on the objective writing-off, which means that the judgment of unit cost provided by processing trade companies could be not only based on the unit cost database but also based on the practical situation of processing trade companies. However at present the situation is that there are more than 100000 processing trade companies and the number is still increasing, but the processing trade supervisors are less than 3000. Because of the limitation of supervising human resource, objective writing-off is impossible. Even if the judgment of unit cost based on the unit cost database is accurate enough, this method still cannot meet the demand of practical unit cost management. For example, because the change of processing trade activities from simple processing to high value-added processing, processing trade activities became more and more diversity, which causes either there is no unit cost information in the unit cost database at all or the unit cost information in the unit cost database could not be updated in time to meet the demand of practical unit cost

management. If such unit cost database is used for unit cost management, it will destroy the principle of unit cost management. Moreover, the judgment of unit cost runs through the producing process. The differences between companies and between products make unit cost management difficult. Limited product knowledge is also an obstacle of unit cost management. Some companies are taking advantage of this loophole, lying about actual unit cost and making money by selling the entrapped processing trade materials.

Fourth, because of the limitation of processing trade supervision human resource, the actual inspection rate of import processing trade materials is barely 10% and the inspection rate of export processing trade goods is only 5%, which is even worse. Instead of preventing smuggling activities, the low inspection rate is becoming the driving force of smuggling activities. Based on the case analysis, taking the advantage of low inspection rate and inadequate supervision coverage is becoming the main smuggling method, such as concealing and fraudulent statement.

Fifth, there are many system risks which exist all the time:

1. The record-keeping period of processing trade activities is a kind of virtual and planned supervision. Under this kind of supervision model, it is really hard to normalize the processing trade activities and eliminate the possibility of smuggling activities from the very beginning. And also the length of supervision period is another obstacle.

2. The unit cost of processing trade production is hard to be measured. Because of the diversity and variability of processing trade goods, there are no unit cost standards for many processing trade goods in the unit cost database. For these processing trade goods, combining the declaration of processing trade companies and experience of customs officials themselves is the main method to identify the unit cost. Obviously this method is objective and risk, which is hard to minimize the opportunities and incentives of smuggling activities.

3. Issue of processing trade handbook is arbitrary. Since the financial condition and production of processing trade companies always change, processing trade supervision department of customs may not sufficiently make an evaluation of processing trade companies before issuing the processing trade handbook. Therefore it is quite possible that some companies who are not fully qualified may obtain the processing trade handbook.

4. Deeper processing transferring supervision is not effective. At present documents approval of customs is the main supervision method to deeper processing transferring. This kind of supervision method lacks the identification of the amount and quality of practical deeper processing transferring goods, which may be taken advantage by smuggling companies to do deeper processing transferring fraud.

5. According to statistics, physical inspection is supposed to be the most effective method to track down smuggling activities. However, because of the limited human resource of customs processing trade supervision, physical inspection during the writing-off period can not be conducted to needed the processing trade companies.

This to a certain extent limits the tracking down and prevention of smuggling activities.

Sixth, the relative legislation is retardant. With the development of processing trade, the smuggling activities against processing trade are also becoming more variable.

However the relative laws and provisions are not modified correspondingly and no new laws or provisions are issued against the new smuggling activities. As a result of retardant legislation, many smuggling activities could not be judged correctly or probably after tracked down, even if the evidence is conclusive. For instance, some processing trade companies smuggled processing trade materials and was tracked down by customs, but it was the employee of customs clearance department of this company who smuggled processing trade materials in the name of company.

Therefore the company was not willing to response for this and indeed there is not such law or provision covering this situation. So the result was that only the employee was held responsible. Now smuggling activities by taking advantage of legislation loopholes is becoming a serious problem in customs supervision.

Seventh, customs declarer management is still weak. Customs declarer likes a bridge between customs and company who response for pass by the supervision information from customs to the governors of companies so that the necessary decision could be made to cooperate with customs supervision. But actually the quality of customs declarer is poor and that's why the case I mentioned above could happen. Customs

declarer management is expected to improve the quality of customs declarer so that customs declarer could really be helpful to customs processing trade supervision, or at least could not be the obstacle of customs processing trade supervision.

Eighth, cooperation between customs and other government departments is not as well as expected. There are many government departments who also have relationship with processing trade approval. But the fact is that only customs response for the processing trade supervision. The cooperation between customs and other government departments doesn't work well in the processing trade supervision, which still need to be improved so that a supervision situation could appear to instruct the correct processing trade activities.

### **1.1.3 The Application of Risk Management in Processing Trade Supervision**

In 1990s, economic globalization developed faster and faster. The growth of foreign trade was nearly two times faster than the growth of economics in worldwide because the foreign investment, which distributed resources all over the world, was becoming the driver of world economic growth. For example, in 1960s, the ratio of worldwide import and export to worldwide GDP was 25.4%, which rose up to 27.9% in 1970s and 38.7% in 1990s, and reached to 45% in 2003. According to the forecast of growth of worldwide economics and trade by World Bank, the ratio of worldwide import and export to worldwide GDP will increase to more than 60% in 2015.

During the process of such large-scale transaction of money and goods, it is quite sure that such activities which break the law will also exist. This kind of situation makes the customs supervision more difficult. Customs supervision encounters a dilemma: on one hand, foreign trade supervision and preventing smuggling activities are the duty of customs. Customs delinquency will lead to the damage of national security and economics, and also negative effect of public advantages; on the other hand, rambling and pointless supervision will not only waste the supervision resource and lower the efficiency but also block the normal production and transaction of enterprises, which will cause huge economic loss and even negative effect to national foreign trade and economic development. The contradiction between Serving the national foreign trade and preventing the smuggling activities makes customs move ahead with plans for innovation of previous customs administration model so that the new one could be suitable for the development of economics.

Therefore, from 1990s some developed countries such as America, Holland and Australia and so on acted as pioneers in introducing the idea and methodology of risk management into the issue and implementation of national customs development strategy to solve the contradiction above mentioned. At the same time, World Customs Organization (WCO) also considered the concept of risk management when the “Kyoto Convention” was modified and finally used risk management as a concrete measure to simplify and adjust customs procedure. Asia-Pacific Economic

Co-operation (APEC), however, put risk management into the collective actions plan of all membership customs. Also there were many countries considered risk management as the important driving force of national customs development and because of this a trend of customs management innovation and introducing risk management into customs management appeared in all over the world. Based on the information technology and risk management system, risk management is now used to forecast, analyze and evaluate the potential risk of customs clearance supervision. According to the risk management, managed objects are divided into four categories based on the risky degree. And also risk management is expected to rationally allocate the limited customs supervision resources. In conclusion, now risk management has become the best choice for customs to cope with the new situation and solve the problems.

In China, according to the latest “Framework Program of Establishing Customs Risk Management System”, customs risk management is defined as “a scientific management method by which customs could recognize, identify, analyze and control the risk formed during the customs management, collect and sum up the possibility and damage of all kinds of customs risk, use modern electronic management method to deal with the risk so that the security and return could be maximized”(Framework Program of Establishing Customs Risk Management System, 2002). Customs risk management could not only use systematic and scientific method to analyze the potential return from certain risk prevention program and try to find the best

combination of various programs, but also identify and measure the potential risk and the damage caused and therefore provide suggestion and recommendation to customs risk management. Besides this, customs risk management is a comprehensive risk prevention method, which could manage the risk by taking the advantages of different risk warning and risk control methods. The substance of customs risk management is to manage risk from a strategic altitude.

The application of risk management in processing trade supervision is very popular now. but still there are some problems.

There is a misunderstanding of risk management in processing trade supervision that risk management in processing trade supervision is just a kind of tool and the process of developing tools, such as database and information system, is risk management.

Actually as mentioned above, risk management in processing trade supervision should be a system which manages customs problems with the thought of risk management so that the optimum allocation of management resource could be achieved. Risk management in processing trade supervision not only include database and information system, but also include the systematic thought of risk management in processing trade supervision, the method to populate the thought, the working mechanism which could embody the idea of risk management in processing trade supervision, and related risk management procedures.



From the mechanism aspect, risk management in processing trade supervision should not be the single units which located in the different department. Therefore, risk management in processing trade supervision should be a unifying system which covers the whole processing trade supervision of customs but not only single customs department.

## **1.2 Purpose Statement**

The purpose of this research is to establish an initial understanding of the application of risk management in processing trade supervision of China customs. In addition to the general goal, Two specific objectives were fulfilled; (a) to find and analyze the risk of processing trade supervision from customs point of view, and (b) to establish an early-warning mechanism to manage the risk of customs supervision in the intermediate period of processing trade activities.

## **1.3 Research Objectives**

Based on the research of weakness and their reasons of customs supervision in intermediate period of processing trade activities, the research is expected to establish an early-warning mechanism to manage the risk of customs supervision in the intermediate period of processing trade activities.

In conclusion, this chapter has provided a brief summary of the development of processing trade in China, and the application of risk management in China customs, especially in processing trade supervision aspect. Because the processing trade is a unique trade model, it is quite necessary for a greater understanding of the mechanism of the trade model and the main characteristics of processing trade activities that may help the future development of policies and customs supervision provisions.

Chapter 2 will show us the literature tools which were used to direct this paper. The literature review provides greater understanding and research direction in regards to the public consciousness of processing trade activities in China.

## **CHAPTER 2**

### **Literature Review**

There are three sections in the literature review. The first is an overall view of the processing trade activities in China, including the development of processing trade activities and the mainly research regarding processing trade. The second is customs supervision of processing trade. In this section the current supervision weakness and some suggestion of improvement will be discussed. The last section offers an in depth discussion of risk management of processing trade supervision.

#### **2.1 The Study on Research Value of Processing Trade**

At present, there are several opinions of the development of local processing trade in China. One of them argues that the profit of processing trade is limited, and this trade could raise the problems such as trade friction, carry-over smuggler and normal trade extrusion, moreover, this trade even can lead to lack of technology innovation, which may influence development of China economy in the long run (Kelin, YE, 2001). Thus, it is proposed that China economy should adopt the exploitation ideology model (Rui, Li,2005), which means that China should abandon processing trade and choosing the way of “Smile Curve” instead. “Smile Curve” means that on one hand, China should focus on technology innovation and brand strategy; One the other hand, based on the capacity of China market, large corporation, which should control the

core technology, should be established. Meanwhile, both the tertiary-industry which is high-tech industry and the service trade need to be vigorous developed. In addition, this argument is also comment the problem rising by processing trade from many aspects, such as: added value of products; the utilization of local recourses; comparative advantage; competitive strength of domestic products and the scarcity of national brand.

One of the remarkable features of processing trade is material processing. It is understood that the processing trade in China focuses on producing and processing. “The materials used in the producing and processing are main imported from foreign markets. The utilization ratio of domestic materials is fairly low” (Yanan Wang, 2006). This situation is bad for the development of domestic industry and the achievement of boasting industry upgrade, which will be an obstacle of the implementation of the policy that taking advantage of processing trade to promote the growth of upstream and downstream.

The products exported in the way of processing trade are normally cheaper than the products exported in the way of normal trade, which is becoming the main reason why Chinese products often encounter trade frictions. Weiqing Ling (2006) pointed that “most processing trade companies are high-tech production companies who are engaged mainly in OEM (Original Equipment Manufacturing) Business without playing an active role in the proliferation of the market. They only participate in

international division of labor in producing process but seldom participate in product design, sales and service process. That's the main source of lower price".

Some people also believe that the processing trade not only changes the situation of China international trade negatively, but also slows down the domestic economic growth. Processing trade has shorter domestic industrial chain than international industrial chain, and lower incremental rate. "Processing trade will cause the deficiency of domestic manufacturing supplies & services, and the long-term development have revealed sign of insufficient reserve force" (Rui Zhang, 2006). Actually there are some problems which will restrict the extension of processing trade industrial chain: first, human resource is deficiency; second, core competency of domestic products is lower; third, core patent, technology and own brand are deficiency.

Actually processing trade indeed has some deficiency, but in some places the local government issuing some policies which are not helpful for the development of processing trade also affect the improvement of processing trade, such as the limitation in labor resources and power resources. In some district where the processing trade is prospect the supplement of labor and power are quite limited not only because of the nature deficiency but mostly because of the policies. Chunhui Ma pointed that "some of current processing trade policies should be changed to guarantee the smooth and healthy development of processing trade".

The other opinions is that although the problems which mentioned above are indeed existing, the quickly development of processing trade is an important impulse power for both the national economy and the growth of external trade. In fact, processing trade is one of most important force for increasing the trade of China. It not only attracts foreign capitals but also relieves the pressure of unemployment in some extent. Meanwhile, it directly spurs resource putting into manufacturing, promotes China's industrialization and continues the movement of international industries.

Guoqiang Long (2003) pointed that "processing trade is one of the most important method for China to participate in international division in the circumstance of internationality". Promoted by the development of processing trade, materials are directly put into manufacturing industry, which develops the manufacturing with great international competence and promotes the industry upgrade of China economy. The appearance of lots of new products and new technology promotes the development of emerging manufacturing. Spill-over effect between technology of processing trade and management is the key factor of the companies' technology development and industry upgrade. Moreover, "processing trade improved the contracture of China international trade and laid the foundation of Chinese world famous companies with self-renovation capability" (Xiaoying Liu, 2008).

Development and Research Center of The State Council suggested by the experiment

that “there is a consistency in the trend and conclusive changes for the period between the development of processing trade and the change of industry structure. Considering the promoting function of foreign investment in capital, technology and market of processing trade activities, it is quite sure that foreign investment and the development of processing trade have a positive impact on China’s industry upgrade”(Qing Wang, 2003 ).

Yuliang, Shen, Churen, Sun and Xueling, Ling(2007) maintained that the cost and feasibility of promotion of processing trade are determined by the multinational corporation’s capability of charging value chain which processing trade is located on. When the developing countries make the transition and promotion of processing trade, it is suggested that they should search and develop the industry which located on the value chains which are little controlled by multinational corporations or do not modeled yet. Zhong Zhang (2006) indicates there is a positive relation between the increase of import and export of processing trade and the growing of China economy. Either the share occupied in GDP growth or pull for economy growth is proved the importance of processing trade.

Also there are many other viewpoints about the positive impact of processing trade. Wang Yong and Zhao Bo (2006) indicated the promotion of processing trade to the growth of economics from the angle of foreign exchange income, job opportunity supplement and attracting foreign capital. Xiaochen Zhao (2006) pointed that the

development of processing trade could change the structure of exported goods by technical diffusion and technology spillover.

From the literature review we can see processing trade is very important to the economic growth, reform and opening-up and industrialization. But upgrade of processing trade is also necessary because of many current problems such as the entry barrier of processing trade is low and the development of processing trade is unbalanced in terms of regional distribution.

## **2.2 Research on Supervision of Processing Trade**

During these thirty years, processing trade supervision was conducted by both Customs and Foreign Trade Department. After foreign trade department approval processing trade companies' foreign trade contract, customs issues processing trade handbook based on the comments of foreign trade department. However, the quick change of market circumstances in the 21 century, such as the development of the information technology in management, sale internalization, product individuation and delivery rapidness, all indicate that the approval procedure of processing trade activities shown above cannot satisfy with the demand of market and business itself.

Closely following the change of global market and customers' demand, production moving in the new direction of enlarged scale and collectivization are the essential



ability of enterprise in market system. Changing the mind that their products are going to serve the global market but not only single customer is the first step of globalization. Therefore “it becomes quite common that when company begins to import materials and arrange production there may be no neither exact customers nor export contracts” (Qing Lin, 2007). The problem is that according to processing trade provision, processing trade handbook could be only issued after processing trade company made export contract with customers. So many processing trade companies have no choices but to make some virtual export contract.

Processing trade handbook administration not only restricts the business development of processing trade companies but also is a limitation of rational distribution of resources. One processing trade company is a single unit with variable function, such as producing, operation and import and export. But the processing trade handbook administration, which is a snap-in management according to the contract, breaks up the whole company into parts and make the company’s integral business operation become hard to realize. The unreasonable division of processing trade handbook makes the amount of materials used for exported products be harder than amount of import materials recorded on the processing trade handbook, which will definitely cause that another processing trade hand book cannot be written off because of the variance between actual inventories of processing trade materials and theoretic amount in the processing trade handbooks. In this condition, processing trade companies have no other choices but to put most attention to match up actual

inventories of processing trade materials and theoretic amount in the processing trade handbooks meanwhile the normal production and export should also be operated. “From customs supervision point of view, this point-to-point batch supervision actually is supervision blank or risk of processing trade supervision” (Dai Jia, 2007).

With the development of processing trade, in order to meet market demand, processing trade companies have to constantly upgrading their products, and therefore their business cycles are becoming shorter and shorter, bringing the increasing numbers application of contract changes which even more than the amount of new handbook application. For example, there were more than 60000 processing trade handbooks in 2004 in Guangzhou Customs, which included nearly 50000 changed processing trade handbooks. Variability of products and more and more detailed and high-tech processing procedures has become a trend of the development of processing trade activities. So relying on manual paper management, customs’ document work was doubled in facing the managing requirement of standardization and stringent. Most of the supervision resources are depleted on the paper approval, paper issuing, stamping, calculation and data collection so that the development of processing technology can hardly be well known and few time can be spend on supervision in the intermediate period of processing trade activities and practical inspection. It seems that customs processing trade supervision in intermediate period of processing trade supervision, which is taking more and more percentages of whole customs processing trade supervision, is becoming less and less important.

Weak supervision directly results the decrease of supervision power. From the year 2003 to 2008, the total money amount of processing trade import and export in Guangzhou customs increased from 20.7 billion RMB to 72 billion RMB. In these five years, 6 customs specially supervised districts, 47 supervision branches, 79 bonded storage, 6000 processing trade companies and more than 80000 processing trade handbooks were added. Compared with the increase of supervision demand, the amount of processing trade supervisors only increased 3.7% annually. In 2008, there were only about 300 processing trade supervisors in Guangzhou customs, which means that the average supervising money amount of processing trade was more than 240 million RMB. However, only about 50 processing trade supervisors were in charge of the supervision in intermediate period of processing trade activities. Compared with more than 7000 processing trade companies, each processing trade supervisor was in charge of more than 140 processing trade companies. The contradiction between the limitation of processing trade supervision resources and increasing processing trade supervising demand makes the strictness of processing trade supervision is more than reasonable and become risky and risky. According to investigation the amount of total scale of processing trade, processing trade companies and related people in China are much higher than in foreign developed countries, but related customs supervisors are only 1/5 of what in developed countries. Li Li (2009) pointed that the deficiency of supervision resources will lead to poor supervision of processing trade goods and processing trade companies, inefficient

monitoring of products' producing process and imperfect improvement of inspection and statistics systems. This is the main reason of lower quality of customs supervision.

Mingfeng Jin, Ming Chen and Qinghua Zhan (2003) pointed the necessity, possibility and advantage of using processing trade company as basic managing unit. They believed that "the change of supervision model is the basement of innovation of processing trade supervision in China". Actually others also suggested that using "company handbook" to instead of current "contract handbook". Xiaoming Wang (2004) indicated that "'company handbook" costs less than "contract handbook" and is easy to be conducted, which will be helpful to reverse the passive situation of current processing trade supervision, relocate management resources and improve practical supervision".

Another viewpoint about system innovation of processing trade supervision is the networking reform. Compared with the system innovation of customs clearance, system innovation of processing trade supervision is relatively lagged, which has become the weakness of customs supervision and obstacle of establishing modern time customs system. In the condition that processing trade is becoming more and more important and national economy is becoming globalized, state polices and systems are gradually adjusted and improved. System innovation of processing trade seems to be more necessary and urgent. "Networking reform is the fundamental way

of achieving efficiency and effectiveness of customs administration” (Wang Tan, 2006).

### **2.3 Risk Management of Processing Trade Supervision**

It is really necessary to reform the customs processing trade supervision because of the reasons mentioned above, one of the solutions of which is to in-depth introducing risk management in customs supervision of processing trade activities. From 2000 the analysis of the main five risk assessment of processing trade supervision had been conducted and finally the conclusion of risk degree of processing trade supervision was drawn. Genlong Chen (2005) pointed that “according to the qualitative analysis of risk degree of processing trade supervision, risk control is a basic measure, such as risk orientated system innovation of processing trade supervision”. From 1990s some developed countries such as America, Holland and Australia and so on acted as pioneers in introducing the idea and methodology of risk management into the issue and implementation of national customs development strategy, and had made the remarkable result.

A popular viewpoint says that compared with risk management in other period of processing trade supervision, risk management of processing trade supervision in the record-keeping period is most important, since processing trade supervision in the record-keeping period is a kind of forehead administration which could prevent the

tax fraud. (Yan Huanong, 2007)

In record-keeping period of processing trade supervision, subject to company-examine controlling the total amount of contract recorded is supposed to be an effective way. Yongqing Li (2009) suggested using database technology to integrate the information in H2000 system such as the amount of processing trade handbook, information of customs clearance and record-keeping information of processing trade company. Xia Wang (2009) indicated that based on the database, business-related risk parameters could be set so that according to processing trade data collected annually or monthly the risk analysis could be conducted. It is universally acknowledged that following risk parameters and information are quite helpful to risk analysis: total money amount of export in the last year, amount of total existing processing trade handbooks, remaining export amount of existing processing trade handbooks, total money amount of import and export of processing trade handbooks, the proportion between import and export of processing trade handbooks, value of remaining processing trade materials of processing trade handbooks, related tax of remaining processing trade materials of processing trade handbooks, processing trade company's customs' category, registered capital and years of processing trade activities and so on. Ying Liu (2009) pointed that customs supervision of exceeding processing capacity will firstly benefit from the risk parameters and risk analysis. For example, risk management department could use contract test to select processing trade companies whose remain processing trade materials are more than the industry's

reasonable inventories, whose remain export amount of processing trade handbooks are larger than the exported amount in last year and whose proportion between import and export are quite unreasonable, to conduct practical inspection so that exceeding processing capacity could be prevented forehead.

Another viewpoint agrees to improve the risk management of processing trade activities in the intermediate period. Liu dan (2009) said “Since the validity of processing trade handbook is quite long and there will be many processing trade handbooks at same time for one company, it is quite difficult for customs supervision because of the lack of supervision resources. And moreover the poor customs supervision will deeply affect the customs taxation and writing-off of handbooks”. So in order to maximize the function of limited supervision resource, changing the original “human supervision” to the “data supervision” is an effective way, which means the customs supervision will completely base on the processing trade data analysis of processing trade companies. After the data analysis of processing trade companies, customs could only target to the processing trade companies whose data are unreasonable to conduct practical inspection. For example, normally there are at most two months between processing trade materials were imported at the first time and products were exported at the first time. So if there are some companies who have not exported products three months later than the first time processing trade materials were imported, this company should be practically inspected.

Li Sun (2008) suggested that risk management of processing trade activities in the intermediate period should use processing trade company as basic managing unit. “Based on the data monthly collected from H2000 database, such as the existing amount of processing trade handbooks, total money amount of import and export of processing trade handbooks, the remaining import and export amount of processing trade handbooks and the remaining available period of processing trade handbooks, processing trade department could realize the progress of certain processing trade activities so that they could urge processing trade companies to adjust the progress of processing trade activities and apply for writing-off on time”. Also using data analysis, risky processing trade handbooks and risky processing trade companies could be found beforehand so that serious smuggling activities could be prevented.

Zhongquan Wang (2009) proposed that export-oriented companies take more than 50% of the whole processing trade companies in China. So the data analysis could mainly concentrate on these export-oriented companies. One of the main features of these companies is the money amount of import and export is stable and directly proportional to the productivity, which means the productivity data could be used to analyze the business condition of companies. Collecting the money amount of import and export weekly and comparing with the amount in the last year could be helpful to find the companies with comparatively large variation. Then strict supervision method will be used so that the risk of insolvency and tax fraud could be prevented.



Besides two viewpoints mentioned above, there is another viewpoint which supported by many processing trade supervisors. These people believe that processing trade administration of customs should not only introduce risk management into record keeping period and intermediate period of processing trade supervision, but also introduce risk appraisal into whole processing trade supervision. The core concepts of risk management and risk appraisal of customs processing trade administration are “selection and give up”, which means based on the phenomenon analysis or data analysis, risky management objectives and comparatively lower risk management objectives or risk-free management objectives could be selected, so that more supervision resource could be allocated to the risky management objectives, such as risky processing trade companies and risky processing trade progresses, however, supervision resources originally targeted to the comparatively lower risk management objectives and risk-free management objectives could be released. By this way, the processing trade management could be maximized. Yi Yang (2009) suggested 80/20 theory can be used in risk appraisal of processing trade administration. Ratios such as recorded money amount of processing trade handbooks, imported and exported money amount of processing trade handbook and value of unpriced equipment could be set as set off to selecte totally 20% of processing trade companies in Guangzhou customs as intensive supervision objectives. So 80% of processing trade activities could be ensured according to customs supervision by focusing on these 20% processing trade companies. “Risk appraisal also should act on the cost management of customs processing trade supervision” (Hai Geng, 2009). Basically the cost

management of customs processing trade supervision should start from developing the strong sense of cost. The supervision investment and the risk of customs processing trade supervision should be balanced. Neither high supervision investment nor high risk of customs processing trade supervision is acceptable. Obviously “the higher the supervision investment invested the lower risk of customs processing trade supervision is” (Ye Yang, 2008), but optimality principle is that supervision investment should be the lower the better, meanwhile the risk of customs processing trade supervision should be the lower the better. In any way the management based on the high cost is not the good management, neither the scientific management. And moreover it is impossible for customs to achieve intensive processing trade supervision by infinite investment in supervision resources. “The ultimate target of customs risk management is to realize highly effective supervision with low supervision cost” (Bo Peng, 2008).

Since the customs supervision of processing trade activities is conducted based on spot-check, there are many other points about spot-check.

One of the points indicated that processing trade involve many industries and processing trade products are variable and diversified, so according to the practical situation of processing trade supervision, selecting the main processing trade companies in industries and targeting to these companies is considered as an effective method to improve the direction and effectiveness of processing trade supervision.

Yixing Liang (2008) suggested that “the selection of the main processing trade companies should relate to the industry background. Generally the champion companies are more powerful than others in industries, whose import and export amount of processing trade activities are much more than others and who is more representative from customs processing trade supervision point of view”. Actually processing trade supervision targeting to the champion companies has two advantages: First, normally the import and export amount of processing trade activities of champion companies takes a great percentage of the import and export amount of processing trade activities of the whole industry, so supervision of champion companies could ensure that majority of processing trade activities are under the control. Second, normalizing the processing trade activities of champion companies could form a kind of demonstration effect to the whole industry or even the whole processing trade companies in local customs.

Theoretically the best way of processing trade supervision is to enclose the processing trade activities in a particular locality, but it is hard to realize and the fact is that processing trade companies are distributed inequality in the whole region of local customs. So one point about the emphasis of processing trade supervision is to divide the supervision resources of processing trade supervision according to the distribution of processing trade companies. Yang Liu (2008) indicated that “based on the appraisal of the condition of processing trade supervision in different administration division and the feedback from anti-smuggling department, inspection department and

enterprises administration department, customs should establish discrepant management of processing trade supervision according to the location”.

## **CHAPTER 3**

### **Research Methods**

#### **3.1 Methodology**

In order to improve the implementation of risk management in the processing trade supervision, especially in the intermediate period, it is necessary to develop this early-warning mechanism. Chapter 3 will describe the methods of research which were used to achieve the goal. There are three sections in this chapter: 1) Statement of methodology; 2) The population and sample; 3) Data analysis. Basically the research can be divided into three parts. First part of the research establishes a foundation of how to conduct the interview and design the questionnaire. Second part of the research is the interviewing and questionnaire process. Third part of the research is development process of early-warning mechanism.

#### **3.2 Statement of Methodology**

Three different types of investigation are used in this research. The research is iterative as the first step of investigation, literature review, leads to the second step, personal interviewing and finally ends at questionnaire investigation. These three types of investigation run through the whole research. Content analysis is used as the first step. Content analysis is defined as “any technique for making inferences by

systematically and objectively identifying special characteristics of messages” (Berg, 2001, p.240). This analysis looks for: first, the research value of processing trade activities; second, the main problems of processing trade supervision from customs point of view; finally, the feasibility of risk management implementation in the intermediate period of processing trade supervision. During the process of literature reviewing, the researcher takes notes of all the viewpoints when they appear. If one kind of viewpoint which related to my research was introduced by different people more than three times, then this is considered a topic. The reason why the three times is chosen as a point of reference is that according to the related research that issues could be considered as hold significance to the topic if they were mentioned three or more times. In the questionnaire design process, those topics which were quite popular are selected to form the basis of the questionnaire.

Case study is what the researcher expected to get the conclusion of the weakness of customs processing trade supervision. All the cases are tracked down by customs regarding as processing trade smuggling, which is proved by the law and provision department of Guangzhou customs and the researcher has also got the permission to study. First, these cases are categorized to four categories by researcher according to the period of processing trade activities when the smuggling happened: smuggling happened during the record-keeping period of processing trade activities, smuggling happened during the intermediate period of processing trade activities and smuggling happened during the writing-off period. Then researcher studies these cases from a

different aspect, smuggling method analysis. Each kind of smuggling methods is recorded by researcher so that all the smuggling cases could be analyzed both from period of processing trade activities and smuggling methods. After that researcher indicates the solutions for each kind of smuggling method from customs processing trade supervision point of view, and analyzes the feasibility of each solutions based on current supervision situation. Finally researcher draws the conclusion of the weakness of customs processing trade supervision and gets some ideas of the implementation obstacles of such solutions mentioned above.

Based on the work experience, researcher designed the questions for the interview aiming at the sufficiency of the processing trade supervision resource, the efficiency of current processing trade supervision method, the support of policies and the deficiency of current processing trade supervision and so on. Then based on the literature review, these questions were modified so that the more direct and effective results could be collected. All the customs departments which either has direct relationship with processing trade supervision or has indirect relationship with processing trade supervision are chosen as the target for the interview of customs administration department since it is important that each interviewee should have enough knowledge of processing trade supervision and relative experience of processing trade supervision. Here the relationship is defined as having relations in processing trade supervision.

The interviews are conducted some by email and some by telephone which were recorded on message recorder. All the questions to interviewees are open-ended questions and there is no simply right or wrong in data collection. After the interview researcher categorizes the answers according to the questions and summarizes them. Finally some points based on these answers form the reasons of weakness of processing trade supervision from customs internal aspect.

It is found that fraud mainly comes from two aspects by cases study: first, intentional tax fraud to maximize the profit; second, accidental tax fraud because of insolvency. The research of the reasons of processing trade supervision risk showed that customs real time monitoring to inventory condition of processing trade companies is hard to be conducted because of confidential restrict. So this early-warning mechanism, which is composed of business trend analysis and business detail analysis, was designed with the feature which is to analysis the healthy condition of business running of companies. This early-warning mechanism is composed of two parts, business trend analysis and business detail analysis. Based on the literature review, financial analysis method is adopted as the main analysis method of early-warning mechanism. "Financial analysis is an applied subject which uses a series of special technical method to analyze and evaluate the investment activities, financial activities, liquidity, profitability and competence based on the accounting, financial statements and other relevant materials" (Guoqing Liu, 2007). Qiang zhang (2006) pointed that "financial analysis could also provide accurate information about the past financial



condition, current situation of business and future for the potential investors, creditors, managers and others who are concerned about the enterprise”.so the financial analysis could serve for the early-warning mechanism sufficiently. Financial ratios and cut-offs are the body of the early-warning mechanism, such as quick ratio, liability/asset ratio, ROCE and Gearing ratio and so on.

### **3.3 Population and Sample**

Another aspect of processing trade supervision analysis was conducted from processing trade companies’ aspect. Researcher used questionnaire to collect the necessary information. The research population consists of all the processing trade companies in the administration of Guangzhou customs. 66 large-scale and key companies of these companies, the sum of money amount of annual export of which take more than 70% of the total money amount of annual export of whole processing trade companies in the administration of Guangzhou customs and which cover all the processing trade industry, was chosen as sample. ( According to “the administration provision of large-scale and key enterprises”, the large-scale and key enterprise was defined as processing trade company whose annual money amount of the sum of export and import is more than 5 million dollars.)

For the interview of customs internal department, researcher picked technology department of Guangzhou customs, processing trade supervision and administration

department of Guangzhou customs, inspection department of Guangzhou customs and law and provision department of Guangzhou customs as interviewee. Customs officials from these four department are have more than 10 years' work experience, who are all quite familiar with processing trade supervision and have enormous experience. So these interviewees are sufficient to provide information the interview need.

### **3.4 Data Analysis**

There are 9 questions concerning the IT system of processing trade companies, the structure of companies, types of main import materials and export products, sum of the money amount of import and export annually and annual amount of processing trade handbooks and so on in the questionnaire. Upon completion of the interviewing process, 27 participants were asked and 4 themes arose from the data. These themes show the business situation of current processing trade companies from variable angles, from which the necessity of the existence of gap between the development of processing trade companies and customs processing trade supervision is clearly displayed.

### **3.5 Limitation of the Study**

The interviewees are customs officials of Guangzhou customs since it is impossible

for researcher to interview with all the customs officials of China customs. During the processing of interview with processing trade companies, these processing trade companies are all limited to processing trade companies under the supervision of Guangzhou customs. Because of practical limitation, the research, especially the interview with customs officials, cannot be conducted in a broader range as well as the questionnaire to processing trade companies. Therefore the conclusion of weakness of processing trade supervision drawn from both customs' aspect and processing trade companies' aspect may have some limitation. For example, there may be some other weakness of processing trade supervision which are not be found or discussed in this research. However, since Guangdong province locates at Pearl River Delta, which has the nature advantage and is the place where the processing trade in China originated, Guangdong province is the place where the processing trade activities is the most wildly developed and most mature and representative. Furthermore, in Guangzhou customs the processing trade companies are from almost all kinds of industries and there are different processing trade companies in size. In conclusion, the results of this investigation are still representative and strong enough to support the research.

## **CHAPTER 4**

### **Research Findings**

With the hope of smuggling case analyzing to find the weakness of customs supervision in intermediate period of processing trade activities, and then analyzing the reason of the weakness of customs supervision in intermediate period of processing trade activities from both customs internal aspect and processing trade companies aspect, this chapter presents the findings from the research. This chapter is divided into 3 sections. The first section describes findings from the smuggling cases analysis. The second section describes the findings from the questionnaire and interview to processing trade companies. The last section describes the findings from the interview to customs internal department.

#### **4.1 Analysis of Smuggling Case**

Table 1 contains the data collected from the smuggling case analysis. The left column lists the types of the smuggling activities summarized from the smuggling cases followed by the columns showing the number of cases in which the smuggling activity is categorized as this type.

**Table 1**

**Types of Smuggling Activities Arose from Smuggling Case Analysis**

<b>Types of Smuggling Activities</b>	<b>Number of Smuggling Cases</b>
Illegal Outsourcing	45
Deeper Processing Fraud	40
Illegal Sales of Processing Trade Goods	119
Sudden Insolvency	91
Unit consumption Fraud	34
Others	31
<b>Total</b>	<b>360</b>

Below is the list of explanations of smuggling activities:

- 1) **Illegal Outsourcing:** Outsourcing of processing trade materials or goods without the permission of customs, or outsourcing of processing trade materials or goods whose tax haven't been made up.
- 2) **Deeper Processing Fraud:** Create a false impression of deeper processing ganging up with upstream or downstream deeper processing companies.
- 3) **Illegal Sales of Processing Trade Goods:** Sell processing trade goods without the permission of customs, or sell processing trade goods whose tax haven't been made up.
- 4) **Sudden Insolvency:** This is a kind of special situation. because of the sudden insolvency, the remained processing trade materials or goods are impossible to be exported, which means these processing trade materials or goods should be treated as normal import goods whom should be taxed.
- 5) **Unit consumption Fraud:** Lie about the unit consumption during the

record-keeping period of processing trade activities so that some processing trade materials could be intercepted by processing trade companies to make more profit.

- 6) Others: Mix the processing trade materials or goods with domestic materials or normal import materials; deeper processing before get the permission of customs; the productivity of unpriced equipment is lower than legal requirement and so on.

Table 2 shows the results of smuggling method analysis from smuggling cases study.

**Table 2**

**Smuggling Methods Analysis**

	<b>Smuggling Methods</b>	<b>Percentage</b>
<b>Intentional Smuggling</b>	Inventories are inconsistent with records	41%
	Wangle Accounts	25%
	Taking advantage of policy loopholes	9%
<b>Unintentional Smuggling</b>	Sudden Insolvency	25%

Basically smuggling activities can be divided into two parts based on Customs Law, intentional smuggling and unintentional smuggling. Researcher here focuses upon an analysis of the methods these smuggling companies use to cover up their smuggling activities. Conclusion drawn from the analysis shows that most of the methods smuggling companies use to cover up their smuggling activities are quite simple. 41%

of smuggling companies even didn't do anything to cover up their smuggling activities, which means the reason why their smuggling activities could success or last for a long while is because customs supervision of processing trade activities is not real time supervision.

Totally 360 tracked down smuggling cases in Guangzhou customs in recent 5 years are analyzed. The analyses shows that the main risk of processing trade supervision in intermediate period of processing trade activities is that customs real time monitoring to processing trade companies isn't conducted. Corresponding to intentional smuggling and unintentional smuggling, customs real time monitoring refers to: first, real time monitoring to the inventory condition of processing trade companies; second, real-time monitoring to the business condition of processing trade companies.

#### **4.2 Analysis of Questionnaire and Interview to Processing Trade Companies**

Table 3 is the results of questionnaire to processing trade companies in Guangzhou customs. The design of the questionnaire has been mentioned in the 3.3 data analysis. Left column of the table lists the name of the processing trade companies who attended this investigation and the row on the top lists all the questions in the questionnaire. All the questions asked are yes-or-no questions and at the last raw of Table 3 the percentage of total answer "yes" is calculated so that conclusion of the questionnaire could be drawn.

**Table 3****Results of Questionnaire**

<b>Questions</b>	<b>Percentage Out of Total Companies</b>
Computer-Based Administration System	46%
ERP Administration	29%
Independent Customs Clearance Department	47.6%
Rank of the Leader of Customs clearance Department Lower Than 4	83%
More Than 100 Product Categories	92%
More Than 2 Types of Trading	97%
Multiple Ports	100%
Average More Than 100 Processing trade handbooks pa.	94%

One of the basic requirements of customs processing trade supervision to processing trade companies is that processing trade company should have computer-based administration system, but in fact this provision has not been implemented strictly since the rapid development of processing trade. According to the results of the questionnaire there are only 30 processing trade companies who have the computer-based administration system, 46% of total processing trade companies involved in the investigation. The fact is that more than half of processing trade companies even don't meet the lowest requirement of customs processing trade supervision, which means the enforcement of customs provision still need to be improved.

Enterprise Resource Planning (ERP) is one kind of popular computer-based administration system and widely adopted by production companies. Through ERP administration system, company could instantly and clearly know the amount of



processing trade materials in inventory, production line and transportation, and could get the real time sum of processing trade materials totally. However the results of questionnaire show that there are only 19 out of 30 processing trade companies who have computer-based administration system have ERP administration system, which takes only 29% of total processing trade companies involved in the investigation. Other 11 processing trade companies only use “Microsoft Office” as administration system, which has lower capacity, no different authority, easy to be modified and destroyed.

Customs clearance department in a processing trade company is quite important for both customs and company itself, which is considered as a bridge between the two. On one hand, customs clearance department could transmit the processing trade supervision requirement of customs and the change of processing trade policies to the management of company so that decisions could be made in time to cooperate with the new requirement or policy change. On the other hand, the feedback of new requirement or policies of processing trade supervision or some other suggestion from processing trade point of view could also be transmitted by customs clearance department from processing trade company to customs. However the results of questionnaire show that there are only 31 processing trade companies whose customs clearance department is an independent department, which takes only 47.6% of total processing trade companies involved in the investigation. The customs clearance departments in the other 34 processing trade companies involved in this investigation

are not independent, some of which are on attached to the financial department of the companies, some of which are the divisions of logistics department. The importance of customs clearance department in a company is neglected by most of processing trade companies.

Generally there are 8 management ranks in a Chinese company. If the department in the company whose management rank is lower than 4, this department is in a low rank in company management, which means this department's influence is weak. Among the processing trade companies involved in this investigation, the management rank of customs clearance department of 54 processing trade companies are lower than 4, which takes 83% of the whole. Actually it is the truth that compared with marketing department or financial department, customs clearance department is less important since it doesn't generate profit directly. The influences of customs clearance department in many companies are quite weak, which in some extent increase the workload of customs processing trade supervision.

According to the investigation, 92% of processing trade companies involved in the investigation have more than 100 types of exported products; 97% of processing trade companies involved in the investigation have three types of trade model: processing trade, normal trade and domestic sales; 94% of processing trade companies involved in the investigation applied average more than 100 processing trade handbooks every year and all the processing trade companies involved in the investigation have

multiple ports. Based on the results of questionnaire we can see the diversification of the trade model, variability of products and the enlargement of business scale have become the distinguishing features of processing trade companies in Guangzhou customs.

### **4.3 Analysis of the Interview from Customs Internal Department**

Interviews were conducted with 27 participants, 6 of whom were from the technology department of Guangzhou customs, 9 of whom were from the processing trade supervision and administration department of Guangzhou customs, 4 of whom were from the inspection department of Guangzhou customs, 5 of whom were from the law and provision department of Guangzhou customs and 3 of whom were the retired leaders. The inclusion of retired leaders is really necessary. Because these retired leaders had worked in processing trade supervision department for many years. Their experience will make good sense to the integrity of interview and even to the correct analysis of findings. The interview is based on the study of smuggling cases. The study results of smuggling cases were proved to these participants advanced and the content of the interview centered on why the customs real-time monitoring to processing trade companies isn't conducted.

Finally, an analysis of the interview against why customs real time monitoring to processing trade companies cannot be conducted was undertaken within 3 aspects:

First is technology aspect. Since the limitation of processing trade supervision resource and the feasibility, the system connection between customs' clearance system and companies' administration system is the best way to solve this problem. However H2000 system is the main customs clearance system response for all the import and export of China foreign trade. Because of the importance of H2000 system, it is designed to operate independently and there is no any interface to the outside world. So the system connection seems infeasible. Another suggestion is to establish a new system which is only used to connect to the processing trade companies' administration company. But how to import the data of processing trade activities is the main obstacle. On the other hand, the assumption of the effectiveness of the system connection is that the processing trade companies' system could provide real-time report of the change of processing trade inventories of the company, which means the ERP system is need. But according to Customs Law it is not compulsory for processing trade companies to use ERP system, if processing trade companies are asked to use ERP system, who should pay for the system become another problem. And moreover, most of the processing trade companies are not willing to connect the system with customs' system since they are always feared to have relationship with government even if they have never made any mistake. This kind of situation should also be faced with before the implementation of the system connection if there is no legal basis.

Second is supervision resource aspect. Since the restriction of computer system

cannot be overcome, if practical inspection could be periodically conducted by customs officials, processing trade supervision could also be improved a lot. But the situation is that periodically inspection could not be conducted because of the limitation of supervision resource.

Dispersal of processing trade supervision resource causes the limitation of supervision resource. In many processing trade department the allocation of supervision resource between field work and office work is reversed. Most of people are mainly entrapped by the complicated and trivial documentary work only a few supervision resources are allocated to the field work, so gradually the practical inspection of processing trade activities is weakened. On the other hand processing trade as a kind of foreign trade model should be paid attention by all the customs department but not only the processing trade department. But the fact is that in some important process of processing trade supervision, such as goods classification and price examination, the goods classification department and price examination department are not willing to cooperate with processing trade supervision department. So processing trade supervision department has to allocate some people to do this, which in some extent disperse the supervision resource of processing trade. Moreover, processing trade administration is related to foreign trade department, financial department, foreign exchange administration department and customs and other department in government. The lack of contacting and cooperation mechanism makes customs taking the charge of processing trade supervision lonely. Functions which should be executed by other

department, such as issuing provisions of processing trade, are now all executed by customs. Integrated management now becomes customs' loan battle, which definitely will disperse the supervision resource of processing trade.

Besides the dispersal of processing trade supervision, current supervision method also causes the limitation of supervision resource. Documentary supervision is the main method of current processing trade supervision. But now because of the development of processing trade supervision, the documentary work has increased a lot, which cost many time and people to deal with. Actually because most supervision resources are entrapped on office work, intermediate supervision of processing trade activities and inspecting writing-off, which should be the most important and effective method to prevent the processing trade smuggling activities, have become the biggest flaw of customs processing trade supervision. Processing trade activities in Guangdong province are much more complicated and diversified than in other area. So compared with documentary supervision, the practical inspection and inspecting writing-off of processing trade supervision are much more effective and important. According to investigation, more than 70% of smuggling activities are tracked down by customs' practical inspection and inspecting writing-off and most of smuggling activities happened in such kind of processing trade companies whom customs have not inspected practically or conducted inspecting writing-off for a long time.

Third is law and provision aspect. The rapid growth of processing trade activities is

form of not only the increase of categories of exported and produced products and money amount of exported products, but also the specification of manufacturing procedure, the increase of processing link against import materials, processing at other places and import and export through different ports. This kind of change increases the amount and objective of customs processing trade supervision, and such kind of totally new situation ask customs to should adopt correspondingly new supervision method to conduct customs processing trade supervision. However the retardation of law and provision tend to be an obstacle of customs supervision matching with such kind of demand. For example, deeper processing in other places and the writing-off of wrapping material are becoming more and more popular in current processing trade activities. The relative laws of customs supervision are issued at the beginning of 1980s, which are not sufficient to cover all the current situation. So customs supervision of deeper processing in other places and the writing-off of wrapping material are quite different in different local customs because what different local customs are doing is according to the provisions issued by themselves. In this case, processing trade companies who have such business mentioned above will under the supervision of more than one customs even more than one kind of customs supervision provisions. If the time limitations of two customs supervision provisions are different, then information such as the remaining amount of processing trade materials, total amount of import processing trade materials and export processing trade goods and so on will not be possible updated in time. Therefore customs real-time monitoring to the inventories cannot be conducted.

Provision's differences between customs and other government department, such as commodity inspection authorities, foreign exchange department, tax department and foreign trade administration department, are also an obstacle of customs real-time monitoring to processing trade activities. It is quite acceptable that the policy coordinate is very important to the health development of processing trade activities. Since these department mentioned above are totally different government department, the laws and provisions they followed are also totally different even if there are some overlapping functions, which seriously influence the efficiency and improvement of customs processing trade supervision as well as the processing trade activities of processing trade companies. For example, the appearance of bonded area will provide transfer service instead of Hong Kong, realize the real-time monitoring of processing trade activities and make great contribution to decrease the "One Day Trip in Hong Kong" which is a legal but abnormal trick as well as a costly and inefficient activity of processing trade companies in order to get tax refund immediately, but the fact is customs consider the processing trade products in bonded area as being exported but tax department doesn't believe processing trade products in bonded area should be treated as being exported so processing trade companies cannot get tax refund at this moment. The policy's incongruity between customs and tax department obstructs bonded area's function, also make the establishment of international purchase center in bonded area become more difficulty. Moreover tax refund policy issued by tax department between bonded area and export processing zones is different. Domestic products or materials in export processing zones could get tax refund but will not get



tax refund in bonded area until these domestic products or materials actually leave China.

#### **4.4 Summary**

This chapter has provided the results of cases analysis, questionnaire to processing trade companies and interview with customs officials from customs internal department. From the results of cases analysis, it is easily found that 75% of smuggling activities are intentional smuggling happened in the process of outsourcing, deeper processing, sales and production, which are all the process temporarily whirled out of sight of customs supervision. Obviously the best way to overcome this flaw is real-time monitoring to the whole processing trade activities. Even to the other 25% unintentional smuggling activities, if real-time monitoring is conducted, events like sudden insolvency could also be predicted and therefore the tax loss could be prevented. However, the results of interview with customs internal department indicated that because of some reasons the risk still exists, the real-time monitoring to inventory condition of processing trade activities cannot be conducted. But through the research it is found that although the customs real-time monitoring to the business condition of processing trade companies is not conducted, there are no obstacles as what customs real-time monitoring to inventory condition of processing trade activities need to overcome, which means under current environment, it is still possible to conduct customs real-time monitoring to the business condition of

processing trade companies.

The Chapter 5 will provide a discussion on the research objective. This chapter will mainly demonstrate how the research objective has been fulfilled throughout the research.

## CHAPTER 5

### Model Formulation

This chapter offers a discussion on research objectives, the early warning mechanism. The first section will briefly introduce the research objective. The second section will look at the model used to establish the early warning mechanism. The third section focuses on content of the early warning mechanism. The fourth section will demonstrated the test of the early warning mechanism and final section is the conclusion of the effectiveness of the early warning mechanism.

#### 5.1. Introduction of Research Objectives

Finishing the explore of the risk of processing trade supervision in intermediate period of processing trade activities, and analysis of the reasons from both processing trade companies aspect and customs internal aspect, now we can research the implementation of the research finds above. As we have discussed at the end of chapter 4 that current technology and policies, which are not easily changed, are the main restriction of real time monitoring to inventory condition of processing trade companies, this paper will aim at the customs real time monitoring to business condition of processing trade companies. An early-warning mechanism is expected to be established to real time monitor the business condition of processing trade companies and give an alarm when the business condition is getting worse or the risk

appears.

## **5.2. Model of Early Warning Mechanism**

According to the cases analysis researcher finds that most of the sudden insolvency of processing trade companies are because of the finance deterioration. Even though part of the sudden insolvency due to malevolent insolvency, there are still some abnormal conditions or changes of finance. So the financial condition could be considered as the most important and representative symbol of the company's business condition. Therefore this paper is going to establish the early warning mechanism based on the financial analysis method through which the business condition forewarning of processing trade company could be well conducted.

Financial analysis is a scientific method which uses financial technology and systematic criteria to analyze the entities' activities in advance, afterward, or while the activities are happening so that the counter-measure could be figured out and adopted against the potential problems or the existed flaws. Besides analyzing, summarizing, generalizing, appraisal and judgment are all used against entities' activities. Actually financial analysis is not only a criteria calculation, but also the appraisal and judgment of systematic criteria, which is considered as the core concept of financial analysis. The judgment and appraisal are based on the company's historical performance and the long term trend of development of the industry the company belongs to.

“Financial analysis likes a magnifier which could be used to examine whether the company’s business condition is healthy” (Qing Qin, 2009). For example, if company’s asset allocation is apt to be equity-type budgetary expenditure, too much investment project will deeply influence the company’s financial structure, business capability and profit capability. At this time the financial department should take action to suggest the management control the investment seriously. This kind of potential risk could only be found by financial analysis. So only through financial analysis, the data about the financial conditions in the past could be transferred to the information which is used to forecast the future situation. In addition, financial analysis could also help to optimize the company’s internal resources, such as resources allocation and collocation of human resources. Ping Wu (2008) indicated that if the financial analysis could be used correctly, it will make great contribution to enterprises administration in modern times.

Financial analysis could be used by different users. The management of companies can use financial analysis to understand the position of the company. After the appraisal of company’s business condition and business administration by financial analysis, management could not only find the potential risk and the solution against the potential risk, but also re-allocate the business assets so that the security and profitability of business assets could be maximized. Financial analysis helps the management to grasp the direction of company’s development and make correct decisions. Some government departments also have to take advantage of financial

analysis to supervise the manage objectives. Before the policies and provisions are issued, it is necessary to conduct investigation or polite. In order to make decision fairly and objectively, government departments have to get necessary information for macro-control, which normally are some statistical results collected by the micro financial analysis and statistics.

The reason and ultimate goal of financial analysis is to find problems and solve problems, so it is important to view the financial conditions from a strategic and overall perspective and that is one of the advantage of financial analysis compared with other analysis methods. The change of criteria and factor should be considered as a whole change of companies all kinds of aspect. “We should clearly find the hierarchy of analysis criteria when we use financial analysis so that we could easily find the problem and well understand it” (Ping Liu, 2010). For example, return on equity (ROE) is an integrate financial ratio, which could be broken down into series of intermediate financial ratios that are the factors of realizing the return on equity, such as rate of net profit to the sales, total asset turnover and equity multiplier. If it is needed these intermediate financial ratios could still be broken down into gross profit margin, ratio of expenses to sales, inventory turnover and current assets turnover, etc. Breaking down integrate financial ratios will be helpful to understand the principle of its compositionality so that the performance of integrate financial ratios could be adjusted by the sub-ratios. For example, though gross profit margin is low, if the total sales could increase and the turnover could keep in a high speed, the total profit can

still perform very well. That's also one of the principles of using financial analysis to establish the early warning mechanism. When the financial ratios of early warning mechanism are used to judge the business performance of processing trade companies, it will be appropriate to make a decision not only based on single ratio since the sum up of a series of ratios may lead the integrate business performance to a total different direction.

### **5.3. Content of Early Warning Mechanism**

From customs processing trade supervision point of view, the most urgent thing for processing trade supervision is whether the tax loss will happen at current stage, followed by the potential risk of processing trade supervision in the long run. So the early warning mechanism should give consideration to both the short-term business condition of processing trade companies and long-term trend of business development of processing trade companies. Based on the type of financial ratios, long term financial ratios and short term financial ratios, the financial analysis of this early warning mechanism is divided into business detail analysis and business trend analysis. Depending on the value of each financial ratio, there are four categories of financial risk which are mild, moderate, serious and risky. When the value of financial ratio falls into risky category, the mechanism begins to warn and processing trade supervision department need to take actions.

### **5.3.1. Business Detail Analysis**

Solvency, profitability and stability are the three main criteria of the short-term performance of processing trade companies.

#### **5.3.1.1 Solvency**

Solvency is the most relevant factor of going concern of processing trade company. Actually going concern of a processing trade company is the most concerned by customs supervision. However mostly the information of going concern condition were provided by the processing trade company itself but not collected by customs supervision department. Even though in certain case processing trade supervision department will collect the information of going concern by exchanging the information with other government department, the information collected are just like the historic record in industry and commercial administration department or historic tax record from tax department.

Table 4 contains the financial ratios which could be used in solvency analysis.



**Table 4****Solvency Analysis**

		<b>Mild</b>	<b>Moderate</b>	<b>Serious</b>	<b>Risky(Warn)</b>
<b>Solvency 1</b>	Debt Ratio	70%	75%	80%	85%
	Current Ratio	1.7:1	1.5:1	1:1	<1:1
	Quick Ratio	08:1	0.7:1	0.5:1	<0.5:1
	Ratio of Cash to Current Liabilities	90%	80%	70%	60%
	Debt Equity Ratio	105%	115%	120%	>120%
	Ratio of Debt to Net Tangible Equity	1.7	1.8	2	>2
<b>Solvency 2</b>	Ratio of Cash to Matured Debt				<0.8
	Superquick Ratio				<0.5
	Times Interest Earned Ratio				<1

Below is the list of explanations of each financial ratio:

- 1) Debt Ratio: Debt ratio is the ratio of total debt amount to total capital, which means how sufficiently the company's capital could cover the total debt. Since for processing trade activity, tax is temporarily free only if the processing trade materials could be fully exported. If processing trade materials are failed to be exported, freed tax should be recovered, which means from finance point of view, customs could be considered as creditor to processing trade companies. From creditor point of view, Debt ratio should be the smaller the better. If Debt ratio is higher than 1 it means that company's all capital are not enough to repay the debt. Then it will be quite risky to creditor. Generally if the Debt ratio is higher than 80% the financial condition of the company is quite weak; if the Debt ratio is higher

than 85%, it is quite possible the business condition of the company is bad.

- 2) **Current Ratio:** Current ratio is the ratio of current assets to current debt, which could be used to evaluate the liquidity of a company as well as the short-term debt paying ability. Poor current ratio will limit the business running and easily cause the sudden insolvency of a company. So current ratio could directly provide a detail statement of processing trade companies' short-term business risk. Generally current ratio of a healthy company is around 2:1 and if the figure is smaller than 2:1, the company's liquidity may have some problem. It is considered as risk if the current ratio is smaller than 1. There are different current ratios in different industry. For example, the current ratio in trade industry can reach up to 4:1, however in catering industry the ratio could be only 1. Considering the situation of processing trade companies in Guangzhou customs, the cut-off provided in the Table 4 is more suitable for manufacturing industry.
- 3) **Quick Ratio:** Quick ratio is the ratio of quick assets (current assets exclude inventory, deferred expense and property losses and gains in suspense) to current debt. Compared with current ratio, quick ratio gets rid of some current assets whose cashability depends on the market, only keep cash and cash equivalent. So the quick ratio could be more clear and accurate to provide the statement of company's liquidity. As showed in the Table 4, it will be good if the quick ratio equals to 1 and if company's quick ratio is less than 0.5 the company is so risky that it may insolvent any time because of liquidity shortage.
- 4) **Ratio of Cash to Current Liabilities:** Ratio of cash to current liabilities = annual

total cash flow / current debt at the end of year. This ratio could also give a statement of company's debt paying ability. Their differences between ratio of cash to current liabilities and quick ratio, current ratio are that the former one gives a statement of company's debt paying ability directly from cash aspect. Generally 100% of cash to current liabilities is the normal percentage for a company with good liquidity. If the ratio of cash to current liabilities is less than 60%, the company's liquidity may have problems at least cash aspect. Then based on quick ratio and current ratio, through which the cash equivalent and inventories could be included, the comprehensive condition of company's liquidity will appear.

- 5) Debt Equity Ratio: debt equity ratio is the ratio of total debt amount to shareholder's equity. This ratio gives the statement of company's financial framework. Generally in different macroeconomic environment company's financial framework should be different. In inflation environment, it is better for company to raise money by debt since by which the risk of potential loss could be transferred to the creditor. So at this time the debt equity ratio will be much higher than normal; In times of prosperity or at the selling season, debt financing will increase the additional profit return; however in times of economic recession, lower debt financing will decrease interest expense and financial risk, which means at this time the debt equity ratio will be much smaller than normal. Generally the debt equity ratio should below 1 and people need to draw attention if the ratio is higher than 12%.

- 6) Ratio of Cash to Matured Debt: ratio of cash to matured debt is one of the ratios give a detailed statement of company's ability of immediate debt paying. If company has enough money to pay the matured debt, the financial condition of the company is good. If company asked for delay the matured debt or raise new debt to pay the old debt, the financial risk of the company is very high. Generally this ratio should equal to 1.
- 7) Superquick Ratio:  $\text{Superquick Ratio} = 0.8 * (\text{cash} + \text{short-term investment} + \text{account receivable}) / \text{current debt}$ . This ratio uses the superquick assets (cash, short-term investment and account receivable) to measure the cashability of company so that the short-term debt paying of the company could be fully understood. Generally superquick ratio should not smaller than 1. But we cannot simply say that company's short-term cashability is weak if the superquick ratio is smaller than 1 since companies may easily to raise money by loan or selling long-term assets. Also the truth of company's cashability may be worse than what superquick shows because of the concealed accounts, joint liabilities and contingent Liability.
- 8) Times Interest Earned Ratio:  $\text{Times Interest Earned Ratio} = (\text{total profit} + \text{financial expense}) / \text{interest}$ . It gives the statement of ratio of the profit include interest to all the interest expense company is gonging to pay. In financial analysis, this ratio is considered as a tool to measure the ability of pay the debt interest. Generally the higher the ratio of the profit include interest to all the interest expense company is going to pay is, the stronger the ability of paying

interest is. So it is really necessary for creditor to analyze Times Interest Earned Ratio to evaluate the security of creditor's rights. Generally it is good if Times Interest Earned Ratio is 2.5 but it is bad if Times Interest Earned Ratio is smaller than 1.

Besides these ratios discussed above, there are some ratios without clear cut-off. Since these ratios are still important and the data these ratio need are quite easy to obtain, they are very popular when the financial analysis method is used to evaluate the solvency of an entity.

- 1) Cash Reserve Ratio:  $\text{Cash Reserve Ratio} = \text{remaining cash amount} / \text{total current assets}$ . This has the same function with superquick ratio, which is used to measure the ability of debt paying.
- 2) Ratio of Cash to Total Debt:  $\text{Ratio of cash to total debt} = \text{the net cash flow} / \text{total debt at the end}$ . Generally this ratio could be compared with the ratio in the past year or the ratio of other company to forecast the going concern of a company.
- 3) Ratio of Net Tangible Assets to Debt:  $\text{Ratio of Net Tangible Assets to Debt} = \text{debt} / (\text{equity} - \text{net intangible assets})$ . This ratio could give the statement of company's debt paying ability in long term, which shows how the creditor rights are protected when the company bankrupts. The advantage of this ratio is that the intangible assets are excluded since the intangible assets is hardly to be evaluated and therefore is not appropriate to be resource of debt paying.

### 5.3.1.2 Profitability

Profitability is the ability to make profit in certain period. Generally the higher the profit margin is, the better the profitability is. For the manager, through the analysis of profitability they could find the obstacles in management process; for the creditor, through the analysis of profitability of recent years they could understand the development trend of the company, which is the basis of future investment to the company. From customs point of view, based on the compare of processing trade companies' profitability, customs could evaluate the risk of processing trade company and make decision of how much processing trade limit could be given to processing trade companies.

Table 5 contains the financial ratios which could be used in profitability analysis

**Table 5**

#### **Profitability Analysis**

		<b>Mild</b>	<b>Moderate</b>	<b>Serious</b>	<b>Risky(Warn)</b>
<b>Profitability 1</b>	Margin Ratio	< ratio in last year's same period	<Industry margin ratio		< Scale of charge
	ROA	< ROA in last year's same period	<Industry ROA	<loan rate	Loss
<b>Profitability 2</b>	Liquidity Ratio				<Debt ratio
	Ratio of profit to cost and expense				<1
	Ratio of profit margin to industry margin				<0.7

Below is the list of explanations of each financial ratio:

- 1) **Margin Ratio:** Margin ratio gives a relationship between the increase of sales and the increase of return. Generally there is no clear cut-off for Margin ratio to a company since different industry and different producing procedure will make a great influence to Margin ratio. So Margin ratio is mainly used to compare with the ratio in last year or the average figure of industry. If company's Margin ratio is lower than other company in the same industry, it is not a good signal since investor may think the company is possible to be kicked out of the industry. If the Margin ratio is even lower than the scale of charge, which means company earned could not cover the expense, it is risky.
- 2) **Return on Assets (ROA):** ROA is the ratio of net profit to net assets. Based on analysis, the reasonable ROA is 0.08. Like Margin ratio, ROA is different depending on the industry, capital framework and company's maturity, so ROA is used to compare with the ratio in last year, the ratio of other company in the same industry. Generally if the ROA is lower than loan rate, investor may choose to debt invest instead of equity invest. Company then will meet financing problem. And if there is a loss, it is quite risk.
- 3) **Liquidity Ratio:** Liquidity is not only important for solvency analysis but also for profitability analysis. Simply to say, good liquidity will decrease the financing cost so that the total profit will not be affected negatively. The lowest requirement of liquidity is that liquidity ratio should higher than debt ratio.

- 4) Ratio of profit to cost and expense: This ratio could give a statement of the profitability excluding the cost and expense. Obviously the higher ratio of profit to cost and expense indicates to higher profitability.
- 5) Ratio of profit margin to industry margin: As a competitor in the same industry, higher profit margin means competitive advantage; however the lower profit margin not only means the competitive disadvantage but also the risk of being loser. Of course even the highest profit margin in the industry doesn't mean there is no risk for profitability, but at least the ratio of profit margin to industry margin could give the idea of the performance of the company, which may be the reason for creditors or investors.

Besides these ratios mentioned in the Table 5, there are some ratios which are more directly to show the profitability of a company. Because there is no clear cut-offs for these ratios, these ratios could only be used to as supplement to early warning mechanism.

- 1) Return on Total Assets (ROTA):  $ROTA = \text{Net profit} / [(\text{total assets at the end of period} + \text{total assets at the beginning of period})/2]$ . ROTA is the symbol of the efficiency of assets usage. Higher ROTA means use of assets is more efficient, so from customs supervision point of view the company's processing trade activities are much safer.
- 2) Gross Profit Margin:  $\text{Gross Profit Margin} = (\text{Sales revenue} - \text{Sales costs}) / \text{Sales}$ .



In most industry in China, the Gross Profit Margin is around 0.15, but the manufacturing industry may have different Gross Profit Margin. So it will be more meaningful if compare one company's Gross Profit Margin with other companies'.

- 3) **Ratio of Return on Primary Business:** In modern times, companies may diversify their business to maintain their competitiveness and profitability. In the balance statement the profit may from both primary business and sideline. So for the supervision government department, it's important to pay more attention on the profitability of primary business. From customs point of view, the registered businesses of most processing trade companies are there primary business. Customs processing trade supervision against the processing trade companies is also based on the performance of their primary business. If the return of primary business doesn't take most percentage of the total return, then actually the processing trade company has escaped from customs supervision.
- 4) **Return on External Investment:** Analysis of this ratio should base on the Ratio of Return on Primary Business. Generally Return on External Investment is a source of company's total profit, so it is the higher the better. But if compared with Ratio of Return on Primary Business Return on External Investment is higher, then the company may have some problems on making profit.
- 5) **Margin Contribution:** This ratio could be used to evaluate the contribution of a certain project or program as well as the primary business. So sometimes this ratio could be used instead of Ratio of Return on Primary Business.

6) Annual Earnings Growth:  $\text{Annual Earnings Growth} = (\text{Net profit this year} - \text{Net profit last year}) / \text{Net profit last year}$ . Simply from financial analysis point of view, this ratio could provide the information of value maintain of total capital and the appreciation of capital; however from customs processing trade supervision point of view, based on the Annual Earnings Growth customs could evaluate the prospects of processing trade companies and adjust the processing trade quota so that the possibility of tax loss could be minimized.

### **5.3.1.3 Stability**

Stability analysis is to evaluate processing trade company's current developing direction, the products it is producing and also the market it is facing. Compared with the stability ratios in last year, the change of production scale, sales scale and market position will be displayed. Based on the analysis of financial ratios of stability, customs processing trade supervision department could come to understand the future development of processing trade companies and market so that the conclusion of security of processing trade activities could be made.

Table 6 contains the financial ratios which could be used in Stability analysis

**Table 6**

**Stability Analysis**

		<b>Mild</b>	<b>Moderate</b>	<b>Serious</b>	<b>Risky (Warn)</b>
<b>Stability 1</b>	Fixed Ratio	80%	90%	95%	>100%
	Margin of Safety	10%	<10%	<0	<0 and Capital Safety Ratio <0
<b>Stability 2</b>	Entity Capital Ratio				<45%
	Working Ratio				<0.5

Below is the list of explanations of each financial ratio:

- 1) Fixed Ratio: Fixed ratio = Net fixed assets / Equity. This ratio gives a detail statement of the total fixed assets supported by company's owned capital, which could be used to identify whether the expansion of company's fixed assets, which is mainly supported by the external equity, is so fast that it is overstretched. Generally this ratio will be considered as safety if it is not less than 100%, which shows a health and reasonable financial structure. However if the fixed ratio is higher than 100% then the company may have some financial problems such as the total capital is deficient or fixed assets are overstretched. Deficient capital will make negative contribution to the long-term debt paying of the company. The overexpansion of company's total assets will greatly decrease the liquidity of assets; thereby company's debt paying ability in the future will also be affected. As shown in the Table 6, if the fixed ratio is less than 80%, company's assets structure is in a quite good position. Risky fixed ratio which is higher than 100%

is a kind of debt-based investment and will be affected seriously if the macroeconomics and external environment change.

- 2) Margin of Safety:  $\text{Margin of safety} = (\text{Actual sales} - \text{Breakeven sales}) / \text{Actual sales}$ . This ratio is also called security extension, which shows the difference between the sales achieved or total sales scheduled and the breakeven sales, or how many sales the company could sacrifice to improve the performance in other aspects in the case the company will not suffer loss. Obviously the higher margin of safety is, the safer the company is. Generally if the margin of safety is higher than 30% the company has a really good profitability and almost risk free from sales problems. However if the margin of safety is negative, the company's business plan may need to be adjusted. Based on the analysis of capital safety, which is the difference between ratio of assets realization and debt ratio, some more detail information of company's risk degree could be displayed. If the margin of safety is positive but the capital safety ratio is negative, the company's business is managed with difficulty. In case of both negative margin of safety and capital safety ratio, the company may have be driven to the last ditch.
- 3) Entity Capital Ratio:  $\text{Entity capital ratio} = \text{Equity} / \text{Total Assets}$ . This ratio is a reverse indicator of fixed ratio, which also indicates the company's capital structure. If the Entity capital ratio is less than 45%, the company's business is supported by the debt and the company may be risky from an investor point of view. Since the Entity capital ratio could give a statement of the trend of company's equity and capital structure, customs processing trade supervision

could keep an eye on the possibility of change of company's business condition based on the entity capital analysis.

- 4) Working Ratio: Working ratio = the net cash flow in the business / the total cash in-flow in the business. This ratio is a typical ratio showing the quality of cash company collected from the whole business activities, which could also be used as a risk indicator to indicate the ability of cash generation and cash collection. Generally if the working ratio is close to 1, the return of company's business activity has a good quality. However if the Working ratio is less than 0.5, company's cash generation may have some problem which may affect the sustainability of business.

Besides these ratios mentioned in the Table 6, there are some ratios which also have the relationship with the stability of a company. Since these ratios could simply indicate some single aspect of the financial condition, these ratios should be integrated with other stability ratios as supplement to early warning mechanism.

- 1) Total Assets Liquidity: total assets liquidity = Net Cash Flow / Total Assets at the End. Cash flow is the most important indicator for the existence of a company. So the Total assets liquidity is useful since it gives the detail performance of company's assets liquidity. Generally 0.06 total assets liquidity is the minimum requirements.
- 2) The Ratio of Cash to Investment: the ratio of cash to investment = the net cash

in-flow from the business in the recent 5 years / (investment expense in the recent 5 years + increase of inventories in the recent 5 years + cash dividend in the recent 5 years). This ratio is a reflection of how the cash company made fulfill the needs of main business activities, which shows company's ability of maintaining the current production or production expansion. Generally if the ratio is smaller than 1, external financing is the main method to support company business.

3) Times Cash Ratio:  $\text{Times cash ratio} = \text{net cash flow from business} / \text{net profit}$ .

Like the ratio of cash to investment, times cash ratio also shows the cash generation from the business. Some times company may still lack of money even if the profit is quite high, which means there are too many income not being converted to cash. So it is still possible that the company will be insolvent.

4) Ratio of Cash Reserve:  $\text{Ratio of cash reserve} = \text{cash amount} / \text{total current assets}$ .

This ratio gives a statement of company's debt paying ability. Different with other debt paying ratio the ratio of cash reserve is to measure the ability of immediately debt paying.

### **5.3.2. Business Trend Analysis**

Development and survive ability analysis and assets operating analysis are the two main criteria of the long-term performance of processing trade companies.

### 5.3.2.1. Development and survive ability analysis

From customs processing trade supervision point of view, short-term survive analysis gives the signal to stop the processing trade activities with bad business condition, but the long-term survive analysis provide the enough information to decide how many quota should be given to the processing trade companies and when and how the processing trade quota should be adjusted.

- 1) Sales Growth Ratio:  $\text{Sales growth ratio} = (\text{sales income this year} / \text{sales income at last year}) - 1$ . Obviously the business sales should grow every year for a good company, so the positive sales growth ratio is the symbol of business booming; however the negative sales growth ratio may indicate that there are some problems in company's business running. Generally the sales growth ratio is used to measure company's market share and business expansion, and also forecast the development of business. Sales growth provides the capital company needs to expand and maintain its sustainability. Therefore the higher the sales growth ratio is, the better the market prospect is.
- 2) Capital Accumulation:  $\text{Capital accumulation} = \text{Equity growth this year} / \text{total amount of equity at the beginning}$ . Besides the appreciation, maintaining the value of capital is also the requirement of total shareholders. Definitely higher capital accumulation could fulfill all the stakeholder's requirement but decreasing capital accumulation means the loss of capital, which should be noticed by the

stakeholders as well as customs.

- 3) **Ratio of Capital Maintenance and Appreciation:** Ratio of capital maintenance and appreciation =  $\text{Equity at the end of the year} / \text{Equity at the beginning of the year}$ . Compared with the capital accumulation, ratio of capital maintenance and appreciation is more concentrating on the capital maintenance. If the ratio is less than 1, there is a capital loss this year in the company.
- 4) **Average Sales Growth in Recent Three Years:** This ratio gives a brief statement of the business development and marketing expansion in recent three years directly.
- 5) **Average Capital Growth in Recent Three Years:** Average capital growth in recent three years =  $\frac{\text{equity at the end of year 3}}{\text{equity at the end of year 1}} - 1$ . This ratio is used to measure the growth of capital so that this ratio could be adopted as a criterion to evaluate the company's growth.
- 6) **Technical Input Ratio:** Technical input ratio =  $\frac{\text{the expense of technology transfer and research input}}{\text{net sales}}$ . For some high-tech company, the investment in technology is directly related to the competence to other competitors and also the sustainability in the market, which will decide the long-term business situation of a certain company.
- 7) **Equity Multiplier:**  $\text{Equity Multiplier} = \frac{\text{Total Assets}}{\text{Total Equity}}$ . This ratio could give a statement of company's capital framework. Generally if EM ratio is becoming higher, the company's total debt is becoming higher. However, if the company's profitability and interest coverage is quite sufficient, high debt doesn't mean that the business condition is risky. Therefore the use of this ratio should



combine to other information such as the industry company belongs to, the stage company is at, the long-term strategy of company and also the macroeconomics.

### **5.3.2.2. Assets Operating Analysis**

Assets operating and turnover are other criteria of company's business running. Assets turnover will affect the profitability and liquidity of companies, so it is a kind of important ratio which should be used to analyze the future business condition of companies. Assets operating is an integration which include assets turnover, capital operating and assets administration. Therefore the results of assets operating analysis will draw a detailed outline of the business condition of a company, which could provide the necessary information for the customs processing trade supervision.

- 1) Assets Turnover:  $\text{Assets turnover} = (\text{primary income} + \text{other income}) / \text{average total assets}$ . This ratio is an important ratio to measure the running efficiency of company's assets, which shows the speed of total assets turnover from input to output during the company's business activities. Compared with the assets turnover at last year, the change of business efficiency between the current year and the last year could be found; compared with the assets turnover of other companies in the same industry, the difference of assets utilization is possible to be discovered so that the company could have the conscious to explorer the potential point of growth, maintain the core competence and market share and

improve the efficiency of assets utilization. Generally higher assets turnover indicates faster total assets turnover and lower assets turnover refers to poorer assets utilization. It is acceptable that 0.8 of assets turnover is reasonable.

- 2) Current Assets Turnover:  $\text{Current assets turnover} = \text{Sales income} / \text{Average current assets in this year}$ . Generally higher current assets turnover indicates the good liquidity of the business. Therefore the risk of insolvency is comparatively low. But sometimes too high current assets turnover may still be risky since the business is too much rely on the supplier and once the supply chain is broken the company may have to stop the business. So current assets turnover remaining at 1 is considered as reasonable current assets turnover.
- 3) Inventory Turnover:  $\text{Inventory turnover} = \text{the cost of sales} / \text{average inventory at this period}$ . In modern times just-in-time inventory is becoming more and more popular, which means lower higher inventory turnover will be helpful for the development of company. For those companies who cannot realize just-in-time inventory, 3 times inventory turnover is acceptable.
- 4) Account Receivable Turnover:  $\text{Account receivable turnover} = \text{Total credit sales} / \text{average account receivable this year}$ . One of the reasons which may cause the insolvency is too much account receivable, so the account receivable turnover could be used as a criterion of company's business risk.
- 5) Operating Cycle:  $\text{Operating cycle} = \text{Inventory turnover days} + \text{Account receivable days}$ . This ratio is composed of inventory turnover and account receivable. Generally 200 days operating cycle is reasonable.

- 6) Owned Capital Turnover: Owned capital turnover = Net sales income / average equity. The difference between assets turnover and owned capital turnover is that the later ratio is mainly concentrating on the liquidity of owned capital. There are four situations which could affect the accuracy of owned capital turnover: First, the high sales income which is possible to be cooked; Second, the net assets is decreasing; Third, low sales income; Fourth, the net assets is increasing.
- 7) Age of Account Receivable: If the age of account receivable is more than 3 month, the account receivable almost is considered as bad debt. If company has many account receivable longer than 2 month, the company's business may be risky too.
- 8) Exchange cost: Processing trade is a kind of foreign trade model so all the processing trade companies may face the problem of exchange. Fluctuate exchange rate may be affected by any kind of things so processing trade companies may suffer the risk of high exchange cost. From customs processing trade supervision point of view, the exchange cost sometime decides the profitability of a processing trade company so it should be especially cared.

#### **5.4. Flow of Early-Warning Mechanism**

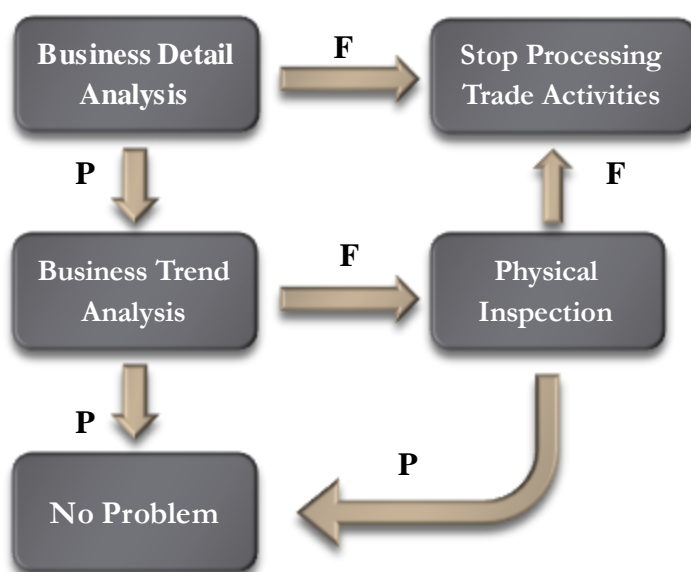
This Early-Warning Mechanism is expected to real time monitor the business condition of processing trade companies and give an alarm when the business condition is getting worse or the risk appears. So this mechanism should work at the

intermediate period of processing trade supervision, which means all the processing trade activities which states after record-keeping and before the writing-off should be supervised. Business detail analysis and business trend analysis are aiming at short-term warning and long-term warning respectively, so there should be different channel for the above two kind of analysis. Meanwhile since business detail analysis will directly give the conclusion of the business condition of processing trade companies, however the business trend analysis will just provide the possibility of unhealthy business condition of processing trade companies, the processing trade supervision action for the next step will also be different.

Chart 1 shows how the Early-Warning Mechanism works:

**Chart 1**

**Flow of Early-Warning Mechanism**



Below is the list of explanations of each step of the Early-Warning Mechanism:

1. As mentioned above, there are four categories of financial risk: mild, moderate, serious and risky. When the financial ratios fall into the risky category, the Early-Warning Mechanism begins to warn and customs processing trade supervision will stop the processing trade activities so that the tax loss will be prevented at embryonic stage.
2. Financial analysis is the basic analysis method of the Early-Warning Mechanism, so to obtain the real financial information is the key point to the success of Early-Warning Mechanism. According to the provision of taxation department, companies should provide the financial statement of the business condition monthly and the balance sheet and audit report at the end of the year. Therefore the financial information needed for Early-Warning mechanism could either directly obtained from the taxation department or submitted by the processing trade companies automatically after the confirmation of taxation department. Processing trade companies should be responsible for the truth of these financial information and customs supervision department will only be in charge of the usage of these financial information such as transfer the original financial information into financial ratios and analysis.
3. First step of the Early-Warning Mechanism is the business detail analysis. The financial ratios transferred from the financial statement of processing trade companies will be used to compare with the cut-offs set in the Early-Warning

mechanism. If the value of financial ratios fall into the risky category, which means it fails the Early-Warning Mechanism, then the Early-Warning Mechanism goes to the final step---the processing trade activities should be stopped immediately by customs processing trade supervision department.

4. If the financial information provided by the processing trade companies could pass the business detail analysis, then the financial information goes to the next step, business trend analysis. The difference between the business detail analysis and business trend analysis in the framework of Early-Warning Mechanism is that if the financial information fails the business trend analysis there is a physical inspection step before the Early-Warning Mechanism goes to the final step. Since it is long-term analysis, financial ratios used in the business trend analysis may be affected by the season, macroeconomics, national policies and other factors. Failing the business trend analysis doesn't mean that the processing trade company must be risky, therefore the physical inspection is necessary.

Physical inspection is not a one-off action. Actually after the business trend analysis, processing trade companies with potential business problems rise into the view of customs processing trade supervision. Then in the physical inspection step more information not only financial information but also others, such as marketing information and management condition, will be collected continuously for the further analysis. If after a period all the information collected from the processing trade company still cannot pass the early warning mechanism, the

processing trade activities of the processing trade company will be stopped. However, if the information collected from the processing trade company passed the Early-Warning Mechanism, then the business condition of the processing trade company has no problem and liberal processing trade supervision against sudden insolvency could be implicated.

5. If the financial information collected from the processing trade company could pass both business detail analysis and business trend analysis, then the business condition of the processing trade company has no problem and liberal processing trade supervision against sudden insolvency could be implicated.
6. Because the external economic environment is always changing and the internal management, production, technology and human resource are various from time to time, even though the processing trade company has passed the Early-Warning Mechanism, the business condition of processing trade company will have chance to become risky. That is why processing trade companies need to be checked by the Early-Warning Mechanism again and again. The frequency of Early-Warning Mechanism checking should be different according to the types of processing trade companies and the ratio of the amount of processing trade companies to the customs supervision resources of processing trade. Based on the situation of processing trade companies in Guangzhou customs, Early-Warning Mechanism checking should be conducted monthly.
7. As shown in the Chart 1, stopping processing trade activity is set as the final measurement of customs processing trade supervision to processing trade

companies whose business condition is risky. Actually stopping processing trade activities is only one kind measurement and there are other measurement dealing with the processing trade companies whose business condition is risky, such as restricting the processing trade quota and lower the customs grade, etc. The measurement depends on the customs supervision, but the ultimate target of the measurement is to avoid the negative effects of tax from business risk of processing trade companies.

### **5.5. Validation Test**

This Early-Warning Mechanism is designed only based on the financial analysis which is seldom adopted in the customs processing trade supervision. Therefore it is necessary to test the validity of the Early-Warning Mechanism. The test aims at the validity of cut-offs set in the Early-Warning Mechanism since these cut-offs determine directly whether the business condition of processing trade companies could pass the Early-Warning Mechanism or not. Higher cut-offs may let all the processing trade companies pass the Early-Warning Mechanism so that the potential risk of tax fraud caused by the sudden insolvency cannot be prevented. However, lower cut-offs may let too many normal processing trade companies fail in the Early-Warning Mechanism so that the Early-Warning Mechanism could neither prevent the risk of tax loss caused by the sudden insolvency nor save the resource of customs processing trade supervision.



### 5.5.1. Test

Since the purpose of the test is to identify the validity of the cut-offs, financial information of processing trade companies whose business condition are quite clear are collected and used for test. For example, financial information of insolvent processing trade companies should not pass the Business Detail Analysis. So if these financial information could pass the Business Detail Analysis, the cut-offs should be adjusted. Meanwhile, financial information of processing trade companies which just have been physically inspected by customs and considered as having good business condition should pass both the Business Detail Analysis and Business Trend Analysis. So if these financial information fail in the Early-Warning Mechanism, the cut-offs should be adjusted.

Totally 13 processing trade companies are chosen for this test according to the principles mentioned above. 5 out of 13 processing trade companies are sudden insolvent processing trade companies. Other 8 out of 13 processing trade companies are existing processing trade companies with good business conditions.

Table 7 shows the results of the test:

**Table 7****Validity Test**

		BDA	BTA
<b>Insolvent Company</b>	LIXIN MENTAL LTD.	F	
	ANJIA SPINNING LTD.	F	
	LIYANG ELECTRON LTD.	F	
	WEIXIN MENTAL LTD.	F	
	NANFENG CLOTHING LTD.	F	
<b>Existing Company with Good Business Condition</b>	SHUNDA IT LTD.	P	P
	PANASONIC ENVIRONMENT LTD.	P	P
	TYCO LTD.	P	P
	WHIRLPOOL APPLIANCE LTD.	P	P
	XINBAO LTD.	P	P
	TIANREN LTD.	P	P
	TIANDI RUBBER LTD.	P	P
	SONGBAI BATTERY LTD.	P	P

As shown in the Table 7, 5 insolvent processing trade companies failed the Business Detail Analysis, the first step of Early-Warning Mechanism. However all the existing processing trade companies with good business condition passed the whole Early-Warning Mechanism. The results of the test are the same as what is designed in advance.

Table 8 is an example of test of an insolvent company to show how the test is conducted:

**Table 8**

		<b>Mild</b>	<b>Moderate</b>	<b>Serious</b>	<b>Risky (Warn)</b>	Financial Condition At the End of Second Quarter	Financial Condition At the End of Third Quarter
Solvency 1	Debt ratio	70%	75%	80%	85%	40%	76%
	Current ratio	1.7:1	1.5:1	1:1	< 1:1	1.9:1	0.6:1
	Quick ratio	0.8:1	0.7:1	0.5:1	< 0.5:1	0.74:1	0.43:1
	Ratio of cash to current liabilities	90%	80%	70%	60%	85%	41%
	Debt equity ratio	105%	115%	120%	> 120%	70%	110%
	Ratio of debt to net tangible equity	1.7	1.8	2	> 2	1.8	2
Solvency 2	Ratio of cash to matured debt				< 0.8	1	0.3
	Superquick ratio				< 0.5	1.1	0.3
	Times interest earned ratio				< 1	1.4	1.5
Profitability 1	Margin ratio	< ratio in last year's same period	< Industry margin ratio		< Scale of charge		
	ROA	< ROA in last year's same period	< Industry ROA	< loan rate	Loss		
Profitability 2	Liquidity				< Debt ratio	45%	20%
	Ratio of profit to cost and expense				< 1	1.4	1.6
	Ratio of profit margin to industry margin				< 0.7		
Stability 1	Fixed ratio	80%	90%	95%	> 100%	60%	60%
	Margin of safety	10%	< 10%	< 0	< 0 and Capital safety rate <0	30%	28%
Stability 2	Entity capital ratio				< 45%	60%	60%
	Working ratio				< 0.5		

The financial condition at the end of second quarter and third quarter of this processing trade company are shown in the table above. These financial conditions are from the financial statement of the end of second quarter and third quarter of the year when this company bankrupted, and have been interpreted into correlative financial ratios. The gray part of the table is the content of Early-Warning Mechanism, which is used to compare with the financial ratios of this company. The right side of the table is the financial condition of this company and the highlight part is the unusual ratios.

It is found from the table that all the ratios related with current assets decreased a lot in only three month but the fixed ratio still remained at a reasonable level, which means this company's business was supported mainly by the fixed assets and it is quite unusual that the current assets took a small percentage of the total capital in this company. The profitability ratios didn't show a great change which means it was quite possible that the great decrease of currents assets was caused by human factor. In fact this company's insolvency was intentional. The current assets were transferred to the parent company manually and that is why the financial ratios shows such a strongly uniqueness.

According to the financial ratios shown in the table above, this company's business condition could not pass the check of Early-Warning Mechanism. Therefore if customs could take steps in time, the company was not possible to evade the tax by the sudden insolvency.

### **5.5.2. Limitation of the Test**

During the test the physical inspection part does not been tested because of two reasons:

1. There is no financial information of selected processing trade companies which could pass the Business Detail Analysis but Fail the Business Trend Analysis and goes to the Physical Inspection part.
2. Even if there are some company who fail the Business Trend Analysis and goes to the Physical Inspection part, since the Physical Inspection is an action of state it is impossible to be conducted simply because of the research at least at current situation.

Therefore the validity of Physical Inspection part is unknown. It is highly expected that further research will continue this work.

### **5.5.3. Validation Result**

Based on the results of tests, all the insolvent processing trade companies failed the Business Detail Analysis, the first step of Early-Warning Mechanism. However all the existing processing trade companies with good business condition passed the whole

Early-Warning Mechanism. The results of the test match up with the fact so this

Early-Warning is workable.

## **Chapter 6**

### **Conclusion**

Processing trade constitutes a high proportion in foreign trade in China. Since processing trade activity has closely relationship with tax revenue and customs supervision, customs supervision of processing trade is really important for the prevention of tax fraud and prevention of smuggling activities.

Sudden insolvency doesn't take too many percentages in all the tax fraud events but still causes millions of tax loss every year. Now the situation is that current processing trade supervision could not prevent the tax fraud because of sudden insolvency efficiently. So it is really necessary to develop a way as a supplement to enhance the processing trade supervision in sudden insolvency prevention.

Financial analysis method is quite popular in finance administration and it has been proved that through financial analysis the business condition of enterprises could be discovered so that further measure could be made to deal with the coming situation. However financial analysis method is seldom adopted in customs processing trade supervision since professional knowledge is needed.

In this paper based on the financial analysis method an early-warning mechanism is developed to warn the sudden insolvency of processing trade companies. This

mechanism introduces the financial analysis method into customs' processing trade supervision, and according to the practical test this mechanism could indeed help to find the risk processing trade companies in advance.

This paper provides an idea for the way forward. In the future research this mechanism still needs to be modified so that the financial ratios and cut-offs used in the mechanism could be more accurate and sufficient. And also when the processing trade companies failed the BTA and goes to the Physical Inspection stage, the operation should be more clarified.



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