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World-oriented Research on China's Quality Problems

----- Forward to the *Journal of Macro-Quality Research*

China quality needs construction, especially the academic construction. The publication of the *Journal of Macro-Quality Research* is one foundation project implemented by Wuhan University Institute of Quality Development Strategy to promote the academic construction of China quality.

The *Journal of Macro-Quality Research* is approved by the State Administration of Radio, Film and Television, and is an academic journal publicly issued home and abroad. Today public publications have become scarce resources, and the reason why the *Journal of Macro-Quality Research* gets approved is its academic positioning. China is not short of journals in quality field, but has no truly academic journal. The academic research on quality, especially the public issue of academic papers is of significant meaning to China's quality construction. Although many journals have published some academic papers on quality research, faced with the complex situation of China quality, both the paper quantity and quality, especially the formation of common academic norms need further innovation and development.

The *Journal of Macro-Quality Research* aims to provide a standard, authoritative and high-level publication platform for Chinese scholars' research on quality; collect a series of original, pioneering and creative research achievements; stir up the emergence of new problems and solutions, new methods and tools, new ideas and theories in the field of quality research, and cultivate a team of internationally influential Chinese quality scholars and experts.

The objective of the *Journal of Macro-Quality Research* aims to become the door to academic studies on China's quality and the think tank platform of resolutions to China's quality, and finally become the first-class academic journal with the international influence.

Chinese studies, especially those on relevant problems in contemporary China, have attracted more and more scholars' attention and participation; but in Chinese studies, the issue of China quality is undoubtedly an important object of study. Great power quality, binary quality and transformation quality superpose with each other and constitute the unique phenomena of China quality which cannot be found in other countries. In terms of the "issue of China quality", our journal focuses on studying the internal law of this phenomenon, and endeavors to provide a scientific explanation for it, especially ways and policies of governing China quality. Therefore, our journal advocates studies facing realistic problems of China quality, form the academic form of China quality study, and construct the Chinese school of quality study. Chinese scholars should have such academic confidence, because we are confronted with the most interesting and unique quality problem in world. The science explains problems; if you find problems, you own the most valuable resources to stand in the academic frontier. Chinese scholars' most valuable treasure is the first-hand experience of realistic China quality problems. Our journal is devoted to publishing research paper on China quality problems, and we are firmly confident that new contributions of general theories will be made to the world academic circles.

The most prominent feature of China quality problems lies in “the macroscopic property”. The influence of macroscopic factors can be found behind each quality phenomena, including social and economic development strategies, national laws and policy systems, citizens’ behaviors and cultural under special national situations, the information dissemination and management in the era of big data. Only through studies on the influence of those macroscopic factors on quality problems, can the phenomena of China quality be explained and can effective quality measures be proposed. Our journal particularly encourages interdisciplinary studies on the problem of China quality, and has set up relatively fixed columns: quality theories and strategies, quality system and laws, quality and economic development, quality statistics and analysis, quality observation and cases, etc. our journal will stick to standardized academic research method, put forward conclusions of general meaning through the empirical observance and data statistics of problems, and conduct scientific verification of those conclusions.

“China quality observation” is chosen as the research topic of the first issue of the *Journal of Macro-Quality Research*, so as to perform the tenet of our journal, face up to realistic China quality problems, adopt the inter-disciplinary research method, and endeavor to propose creative theoretical viewpoints and practical measures on the basis of empirical data analysis. “China quality observation” is a huge research project targeted at China quality problems, in which all colleagues in Wuhan University Institute of Quality Development Strategy jointly participate and have worked for three years, and it is also the achievement of the Major Project of National Social Science Foundation of China “Study on China Quality Safety Evaluation and Network Prewarning Method”. This paper research covers various aspects of China quality problems, the analysis of economic perspectives, the research of legal perspectives, the discussion of public management, the data statistical analysis and case analysis. The common research topic of all papers is to explain the current situation of China quality by the inter-disciplinary research method.

From some perspectives, Chinese scholars are quite lucky, especially those studying problems of China quality because we are faced with unique realistic problems of China quality which cannot be found in other countries. Our high-quality research papers will not only provide the scientific support for the resolution of China quality problems, but also contributes Chinese scholars’ efforts to the innovation of the quality science in world. We sincerely invite overseas scholars to join hands with us, and wish that through our unremitting efforts the *Journal of Macro-Quality Research* will become the footstone for the academic progress of China quality, and innovative ideas of China quality will lead the progress of China quality practices.

President of Wuhan University Institute of Quality Development Strategy

Cheng Hong

Chief Editor of the *Journal of Macro-Quality Research*

June, 2013

Contents Specialists and Scholars Could Popularize and Transmit More of Their Expertise to the Public¹

——Delightful to Read *What Is It with Chinese Quality*

Liu Renhuai

Prof. Cheng Hong's new work of *What Is It with Chinese Quality* was published in June of this year, and appeared on the best-seller list with the works of Chai Jing and Yu Hua. Considering *What Is It with Chinese Quality* selects the widely-concerned topic of "quality", and adopts the writing styles of profoundness and popularity, preciseness and humor, it's no wonder that it has such a good market. Prof. Cheng Hong is an influential expert in quality field, and has created many works in quality research, especially in the macro-quality research, who introduces those works to the general public in a way that people are delighted to see and hear, and endeavors to enhance citizens' quality; In my view, Prof. Cheng Hong has done something quite meaningful, and has displayed his originality and due responsibility, from which I have produced several associations.

Association I: experts should popularize more of their expertise to the public

After the painstaking efforts of one generation after another, China has reached the fast lane of the S&T Power with big strides; however, one indisputable fact still exists that there is still a long distance for China to become a popular science power, and I summarize it in "Three Lacks"—a lack of experts in the science popularization, a lack of influential works on science popularization, and a lack of public knowledge of popular science.

At present, the quantity of science popularization works is still not enough, especially high-quality popular science works; in addition, such few popular science works have few readers, and even no readers. Why is science popularization work faced with such dilemma? In the final analysis, it results from few professional, outstanding and influential authors in popular science. Due to few authors – few works – few readers, the science popularization has fallen into the vicious circle of "Three Lacks" dilemma, and excellent authors of the popular science will play a crucial role if we want to get out of the dilemma.

Excellent popular science authors must master profound professional knowledge, be familiar with the laws of the science popularization, and skilled in writing popular science works. Since experts and scholars stand in the forefront of studies, they have the advantage in problem discussion and analysis; and if they're devoted to the science popularization, their depth and influence will be far beyond ordinary authors' comparison. In addition, only in this way can their works get rid of the suspicion of vulgarity and knocking together, and display the grandeur of popular science works, for which *What Is It with Chinese Quality* has set a good example.

China's quality issue is concerned not only by the Chinese public, but also by the world. Considering this is such a complex phenomenon, and a vast and rich system, only outstanding experts in quality field can scientifically analyze Chinese quality, clarify its internal laws, and find convincing answers.

Prof. Cheng Hong is the president of Wuhan University Institute of Quality Development Strategy, an influential institute of scientific macro-quality research and talent cultivation, and also the chief editor of the *Journal of Macro-quality Research*, the only academic journal in macro-quality field. He's a diligent pioneer in macro-quality field and has made outstanding achievements. For example, he has published the first monograph of *Macro-Quality Management*, has led a team to establish observation bases in the quality field, has published *2012 Chinese Quality Development Observation Report-"Transformation Quality"-Oriented Common Governance* from the perspective of consumers' perceptions, has led a team and studied several key quality research topics. Cheng Hong's important research achievements over past years have been included into *What Is It with Chinese Quality*, which is an academic monograph in science popularization. His profound expertise has laid the foundation for the success of the science popularization, and constitutes a vital element of one successful popular science work.

¹ Liu Renhuai, the academican of Chinese Academy of Engineering, E-mail: lrh@jnu.edu.cn.

The creation of popular science work is somewhat difficult, and the failed one makes the author feel incompetent and feared; even if one fruitful professional scholar also has the difficulty in accomplishing a popular, effective and well-recognized work. Fortunately, Prof. Cheng Hong knows how to handle it. He investigates reasons behind complex and contradictory Chinese quality phenomena, and makes a careful and detailed analysis of multiple hidden factors influencing the quality, such as the economic and social development, laws and policies, citizens' behaviors and culture, and information in the age of big data. As a professional expert in quality research, he voices original ideas of common quality phenomena, puts forward novel problems, and adopts scientific and pragmatic methods, which has left a deep impression on readers and benefited them a lot.

From the perspective of the globalization and the age of big data, and starting from the unique quality phenomenon caused by the mutual superposition of the great power quality, binary quality and transformation quality, the author freely changes the role in the government, enterprise and consumers, discuss the quality in experts' view, perceive the quality from citizens' perspective, and investigate complex phenomena to analyze problems at the deep level in quality field. Through the layered analysis, economic propositions of quality issues behind the government, enterprise and consumer are brought into daylight; moreover, according to the clear duty allocation, the government, enterprise and society find their own position, perform their own duty, and join hands in the co-governance of Chinese quality. This book lays a special emphasis on roles and duties of the society, market and consumer in quality governance. In terms of existing comments on Chinese quality, most of people tend to think that this is a terrible age, but the conclusion reached from empirical analyses proves that "in terms of the quality, this is the best age, and also the worst age". Whenever quality problems emerge, people always complain about the loose government regulation, but this book proposes an astonishing idea: "The primary problem in the quality system is caused not because that the government fails to perform the duty, but because that the government has done too much what in the charge of market and society. This book holds that during the quality construction, the consumer is not the onlooker attempting and accomplishing nothing, and is not a critic aflame with indignation, so the book has specially advocated that "everyone is the constructor of Chinese quality", and that "when Chinese consumers are aware of the quality, Chinese quality will revive entirely". Those cutting-edge opinions from the forefront of the quality research have challenged and overthrew people's inherent opinions, aroused the popular thinking and showed the wisdom. This attraction is naturally irresistible. In reality and on the internet, it has gained wide acclaims: "A good and enlightening book!" Fondle admiringly "It's filled with wisdom, and I feel enlightened by few words..." "It's originally bought as paper reference. It's unexpectedly fascinating, and it has given me a brand-new thinking space in future. Suddenly I feel enlightened and inspired." "The author speaks with data, and his views are original and powerful!"

Association II: professional scholars should have the ready-sale consciousness of academic essays and monographs.

Each year an immense number of essays and monographs are published, but few are widely propagated, so most of them are left aside in some corner of the paper pile and the network, and finally forgotten by the world like a flash in the pan. The limited propagation of essays and monographs is closely linked to their profession; but in addition, our professional scholars have a dead zone of the concept, namely, the lack of the propagation awareness? It's a pity that essays with penetrating judgment, enlightening readers' minds and of practical significance are not promoted and propagated in the form of science popularization, and finally buried in oblivion. Once an old scientist advocates using the popular science article to explain each essay for the sake of science popularization; of course, under the current situation it's impractical and doesn't need to be so demanding. However, popular science articles with topics related to the economic society, national economy and the people's livelihood, citizens' quality and ideological emancipation should be written, so as to give a full play to its effect.

As the old saying goes that "Words without literary elegance will not go far". I want to add one sentence to the science popularization job of academic essays and monographs "Literary but not popular articles won't be widely propagated", in which the "popular" doesn't mean vulgarity, but high quality and elegant taste.

The difficulty of science lies in making complex problems simplified. Popular science works have their own inherent laws. In my opinion, it must have the following characteristics: close to life and reality; impressive ideas and popular expressions; flexible forms and smooth words. Cheng Hong and his team have been advocating researches targeted at realistic problems. An academic popular science work must adopt the prospective method and focus on the scientific law explanation; it must stand fast and conduct an empirical analysis of various phenomena in reality. *What Is It with Chinese Quality* has done quite well in this point, and contains impressive quality propositions in daily phenomena, make complex, difficult and professional quality issues simple, easy and popular, in which way nonprofessional readers have no difficulty in understanding. "Three qualities in one country", "Why does women's wardrobe always lack one piece of clothing?" "No matter how developed the internet it, why Ivy Universities such as the Harvard University and Yale University cannot be replaced?" "Who is in charge of Chinese quality on earth?" "Can 'cheap goods' have

good quality?” “Why do companies of leading technology go bankrupt?” in the book shows that it’s educational and interesting.

The author of *What Is It with Chinese Quality* is more an experienced and amiable tour guide than a famous quality expert. He leads readers to wander about numerous quality “sceneries” home and abroad, and uses popular and interesting words to introduce its development. It’s attractive and arouses readers’ thoughts and mediation. While reading this book, you can find the pleasure in reading and interest in wandering, so who will reject such double pleasure?

Association III: the science popularization needs the incentive mechanism and the consciousness of responsibility

In the document, the status of science popularization work is quite important. In 1994 in *Several Opinions on Strengthening the Popularization Job of Science and Technology*, the paper of Central Committee of the Communist Party of China and State of Council, the science popularization job is elevated to the strategic height related to the country’s prosperity and national strength. *Law of the People's Republic of China on Popularization of Science and Technology* issued in 2012 has specified relevant government departments’ duties in the science popularization and pointed that the job of science popularization is the common task of the entire society.

But in reality, there is huge difference between the science popularization work and its deserved position. Not only the science popularization is lost in the vicious circle of “Three Lacks” dilemma, but also experts and scholars don’t care about the science popularization. One researcher undertakes a topic and as the topic goes through the acceptance inspection, it seems the task is finished; with more topics, it’s easier to establish the position in the field. In the research process, it is hard to think of science popularization. Undoubtedly, the science popularization has been forgotten and marginalized. As I remember, one survey by Chinese Academy of Sciences a few years ago shows that 80% of scientific and technical workers think that the science popularization has little to do with themselves because special persons are appointed for the science popularization.

Why does such circumstance appear? The primary reason is that the science popularization lacks the incentive mechanism and restricts experts and scholars’ enthusiasm in participating in the science popularization. The science popularization is difficult to obtain achievements, and it’s not called achievement and is useless for title appraisal; in addition, it produces no economic benefits, so it’s no wonder that few scientific workers are willing to work on the science popularization, and even consider the science popularization vulgar.

In fact, the scientific work should be a complete progress complementary to each other, including scientific researches, scientific applications and scientific popularization. The science and technology should be innovative and popular; innovation and popularization are “two wings in one body” of the scientific work and cannot be divided. The science popularization work abandons the prejudice of the public, stimulates and ignites the potential innovative spark, so it’s indispensable. But in fact, due to various subjective and objective reasons, “two wings in one body” as close as flesh and blood are forced divided, emphasizing the innovation and despising the popularization.

Survey results of the 8th Chinese citizens’ scientific literacy in 2010 show that citizens possessing the basic scientific literacy account for 3.27%. This figure is not optimistic. In recent years, why do some sudden public accidents often trigger hot-spot topics of science popularization? For example, “SARS” and public health, Japanese nuclear leakage and “salt shortage”, food quality accident and food security. If the science popularization becomes the hot spot among sudden accidents and the focus of people’s concern, it only indicates one fact: there is a lack of science popularization among the public, and our science popularization always take stopgap measures and seriously lag behind the reality. Recently, it’s reported that one man called “Qi gong master” makes contacts with so many celebrities and makes everyone dumfounded. To enhance the public scientific literacy and the human resource level is always the topic of Chinese modernization. Science popularization work really has a long way to go.

The vigorous science popularization work is in urgent need of increasing the incentive mechanism by our nation. It’s reported that relevant departments are planning or have taken actions to train professional talents in the science popularization, increase expenses in science popularization and include the science popularization topic into the state scientific plan. On one hand, the science popularization needs incentives, and on the other hand, it needs the sense of mission and consciousness of responsibility. The author of *What Is It with Chinese Quality* realizes that the science popularization is not only a part of the social culture, but also a part of the state technical innovation; a good job in science popularization is of vital importance in driving the modernization process. The original intention and responsibility of *What Is It with Chinese Quality* is to provide consumers with valuable and free quality data, reshape citizens’ quality concept and behaviors, advocate the community to fully participate, and act as the constructor of Chinese quality.

The science popularization not only means to popularize the scientific knowledge, but also means to popularize the scientific spirit, scientific quality, scientific thought and scientific method. *What Is It with Chinese Quality* states that “the quality is not only science, but also a belief”. In terms of the

science popularization, in the author's view, it's not only a program benefiting the public, but also philanthropy with beliefs. Even though under the current mechanism the science popularization cannot bring many benefits, Prof. Chen Hong is concentrated on the science popularization and regards it as a career, which really needs a belief. He has traveled around China and has hosted numerous popular lectures to popularize the scientific quality concept among the public. That's to say, except the lecture *What Is It with Chinese Quality* is another form of the quality science popularization to propaganda the scientific quality concept. Fortunately, very soon his painstaking efforts gain readers' response and identification "the quality suddenly makes me feel the responsibility on shoulders. The road to quality lies in the co-governance, and the road to quality lies under our individual feet.

While reading *What Is It with Chinese Quality*, I not only feel happy, but also feel the responsibility. I strongly recommend such excellent academic popular science work, and wish more people to read it.

The History, Current Situation and Reformation of the Chinese Environmental Monitor Mechanism¹

Cai Shouqiu

Abstract: The environmental monitoring is a basic means to know, master, assess and predict the situation of environment quality, and the environmental monitoring mechanism includes the monitoring organization system, monitoring mode, monitoring technical specification, monitoring information application and monitoring management system, which provides the basic guarantee for standardizing and organizing the effective and sustainable development. While China is making great achievements in the environmental monitoring, many problems emerge in the monitoring mechanism. For example, the mode of the environmental monitoring information collected by the government and environmental monitoring organized by the planned economy will bring about various problems such as too high environmental monitoring cost, low data accuracy, low effectiveness, poor innovation ability and scalization degree, and the difficult development of non-government environmental monitoring stations (points). It's proposed that the reform of environmental monitoring organization in China should adopt the government-leading, government-market co-operating mode with environmental monitoring information mutually produced by the government and society, namely, the coexistence of environmental monitoring organizations directly led by government environment protection administrative departments and non-government environmental monitoring organizations qualified for the environmental monitoring. Various effective environmental monitoring and operation management modes should be adopted to promote the socialization and marketization of the environmental monitoring, and strengthen the society-oriented and market-oriented legal construction of environmental monitoring.

Key words: Environmental Monitoring; Environmental Monitoring Mechanism; Environmental Quality

The environmental monitoring is the basic means to know, master, assess and predict the situation of environment quality and the major source of the environmental information. Without advanced technology, scientific and effective environmental monitoring, the performance of the environmental quality cannot be evaluated. In addition, the environmental monitoring mechanism including the monitoring organization system, monitoring mode, monitoring technical specification, monitoring information application and monitoring management system provides the basic guarantee for standardizing and organizing the effective and sustainable development of the environmental monitoring.

I. The History and Current Situation of Chinese Environmental Monitoring Mechanism

As early as the early 1950s, some government departments and industries in China have begun to analyze some environmental pollutants. For example, the water-chemistry routine item measurements of the underground water and surface water by Water Conservancy and Geological Departments. The Ministry of Health surveys and measures the atmosphere, drinking water and operation field. In 1953 Chinese sanitation and anti-epidemic station was established and some systems were formulated in labor environmental monitoring. For example, article XIV in *Management Methods to Prevent Siliceous Dust Hazards (Draft)* (1963) provides that “enterprise units shall establish the regular dust monitoring system and assign certain personnel to be responsible for dust measurement. During the “Great Cultural Revolution”, in order to prevent environmental pollution, the environmental monitoring network and environmental health monitoring system centered on sanitation and anti-epidemic station of the Ministry of Health came into being. In June, 1972, the *Report on Guanting Reservoir Pollutions and Opinions of Solutions* endorsed by the State Council put forward that the Ministry of Health shall be responsible for proposing the plan of building the national “Three Wastes” monitoring and testing system and preparing necessary monitoring and testing systems. *Several Provisions on Protecting and Improving Environment (Draft)* (1973) provides special stipulations on “carefully implementing environmental monitoring work”, requires to shoulder the monitoring task “on the basis of the health and anti-epidemic units in existing health system”, and defines environmental monitoring institutions’ duties. Key Points and Major Measures in Environmental Protection Plan put forward the objective of “building a sound environmental monitoring system”. After the 3rd Plenary Session of the 11th Central Committee of the Chinese Communist Party, the environmental monitoring network centered on the monitoring station of the environmental protection department comes into being. *Key Reporting Points of Environmental Protection Work* (1978) endorsed by the Central Committee of the Communist Party of China proposes a series of important measures to “strengthen

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the environmental monitoring work” and requires “State of Council environmental protection department to set up national environmental monitoring headquarters and strengthen the cooperation among the departments of health, water conservancy, agriculture and forestry, aquatic products, meteorology, geology, ocean, traffic, commerce and industry, rationally divide labor, close cooperate, and form the national environmental monitoring network. *Environmental Protection Law (Trial Implementation)* (1979) consider the task to “unify and organize the environmental monitoring, survey and master the national environmental situation and development trend, and put forward improvement measures” as a major duty of environmental protection agencies established by the State Council. In order to better organize and promote the environmental monitoring work, the urban construction environmental protection department issued National Environmental Monitoring Management Regulations in July, 1983, and provides specific stipulations on the task of environmental monitoring, institution duties and functions, monitoring station management, environmental monitoring network and report system. Afterwards, relevant state departments prepared various regulations, standards and policy documents such as *Management Methods of Environmental Pollution Governance Facility Operation Qualification License* (2004), *Pollution Source Automatic Monitoring Management Methods* (2005), *Environmental Monitoring Management Methods* (2007), *Pollution Source Automatic Monitoring Facility Operation Management Methods* (2008), *Offshore Environmental Monitoring Specification* (HJ 442-2008) (2008), *Field Supervision and Inspection Methods of Pollution Source Automatic Monitoring Facilities* (2012), *Management Methods of Environmental Pollution Governance Facility Operation Qualification License* (2012). Therefore, the special environmental protection and monitoring is started from the system comparison in environmental survey and measurement as indicated by Premier Zhou in 1971, so up to now it has over 40 years’ history. In accordance with 2011 Communiqué of Chinese Environmental Conditions issued on May 25, 2012, up to the end of 2011 there have been 2587 environmental monitoring institutions in national environmental system, among which one state environmental monitoring station, 36 provincial environmental monitoring stations, 339 local environmental monitoring stations, and 2211 county-level environmental monitoring stations; 54698 environmental monitoring staffs; 1890983m² environmental monitoring room; 1697951 sets of environmental monitoring instruments. Only in 2011 in the aspect of environmental quality monitoring, our nation monitored 10984 surface water sections, ran 950 surface water automatic monitoring stations; monitored 4346 air point locations, and operated 2100 automatic air monitoring stations. The environmental monitoring job has become an indispensable part of Chinese environmental protection career.

While China has made great achievements in the environmental monitoring, many problems emerge in the monitoring mechanism. And those problems are mainly manifested in the following several aspects

Firstly, the split blocks can cause conflicts and problems between departments, contradictions and problems of national interest and local interest. Because multiple departments are involved in the environmental pollution prevention and environmental protection, in the central government level, so many environmental monitoring stations (or points) are established by government departments such as Ministry of Environmental Protection of the PRC, Ministry of Water Conservancy of the PRC, State Oceanic Administration People’s Republic of China, Ministry of Agriculture of the PRC, Ministry of Transport of the PRC, Ministry of Housing and Urban-Rural Development of the PRC, and Ministry of Health of the PRC, whose personnel, expenses, equipment, monitoring tasks and data are governed by this departments, so various problems have emerged, such as the repeated or uneven monitoring tasks, contradictory monitoring data or information, a waste of monitoring resources and a lack of unity between all department monitoring institutions. At the level of local governments, environmental monitoring stations (points) have been established in all provinces (autonomous regions, directly-controlled municipalities), cities (districts) and counties, where personnel, expenses, equipment, monitoring tasks and data are allocated and governed by local governments, which have provided conditions for the government’s intervention with the environmental monitoring, and the breeding of localism and selfish departmentalism. When government officials’ performance is influenced because monitoring data truly reflect the local pollution degree, it’s inevitable that some local government departments start administrative interventions, such as ordering the environmental monitoring station to modify and even forge data, which caused local monitoring conclusions widely divergent from monitoring results reached by state environmental protection departments. In recent years, such events happen frequently, which not only influences the scientificity of environmental decision-making and the seriousness of environmental law enforcement, but also opens the door for polluting enterprises to avoid responsibility.

Secondly, the mode of producing environmental monitoring information by the government and organizing environmental monitoring by the planned economy will bring problems such as too high cost of environmental monitoring, low data accuracy, low effectiveness, poor innovation ability and scalization degree, and the difficult development of non-government environmental monitoring stations (points). For example, it can be found from the environmental monitoring system established by environmental protection departments that the environmental monitoring stations (points) started from 1980s have obvious features of the planned economy. Because environmental monitoring stations affiliated to the environmental system from central government, provinces (autonomous regions, directly-controlled municipalities) to cities (districts), counties and townships, so the

pattern of multiple environmental monitoring points and wide coverage is formed. The government monopolizes the environmental monitoring information production, and is somewhat powerless to meet environmental services of wide monitoring points, heavy tasks and high requirements. Due to wide coverage and many personnel in monitoring stations, the input invested by the government in the environmental monitoring is mainly used to distribute wages of personnel in monitoring stations, so there is a lack of fund for running, maintaining monitoring equipment and conducting the transformation of environmental monitoring technologies, and there are few monitoring stations really capable of the environmental monitoring and meeting national standards. Therefore, the large-scale and highly professional environmental monitoring agencies are difficult to grow, which impedes the further enhancement of the environmental monitoring service ability, scale and competitiveness. Due to the financial strain, in order to gain benefits from enterprises causing the pollution, some environmental monitoring agencies take advantage of their own rights to provide false monitoring data and seek benefits for its own department, thus it has lost the original function of monitoring station. Because the operation of environmental monitoring agencies is directly led by the government, the monitoring personnel is appointed by the government, the monitoring expenses and personnel wages are allocated by the government financial department, so the mechanism of “enjoying subsidies, receiving salaries, run official business, iron bowl and no competition” makes monitoring personnel difficult to give play to the zeal, difficult for technical innovation, difficult to make full use of the professional advantages, difficult for asset appreciation, and difficult to strength the competitiveness, so various problems emerge such as too high monitoring cost, low data accuracy, low equipment operation ratio, and low efficiency. Due to the integration of government with enterprises, the environmental protection administrative department spares vast energy in the basic maintenance and operation of environmental monitoring, which result in weakening the role of the environmental protection administrative department in controlling, assessing, supervising and managing the environmental monitoring quality. In addition, a large number of governmental environmental monitoring stations (points) or even too many (they are always competing for monitoring tasks and expenses) have objectively restricted and hampered the development of non-governmental environmental monitoring stations (points).

Thirdly, the socialization, marketization, professionalization and scalization of the environmental monitoring develop slowly and confront great resistance. Before Chinese accession to WTO, the environmental monitoring task has been implemented by environmental monitoring stations affiliated to the Environmental Protection Bureau. After Chinese accession to WTO, as the environmental monitoring market has been expanding, traditional environmental monitoring stations cannot meet the demand of social environmental monitoring, so China starts to gradually open some environmental monitoring (laboratories, etc) fields, and some private laboratories are established to start business. For example, in February, 2008, Changsha Environment Protection Agency implemented the socialized operation reform on the motor vehicle tail gas detection, and entrusted Hunan Hengkai Environmental Technology Investment Co., Ltd. as the third party of operation pilot project company to test the motor vehicle tail gas. With the growing number of private environmental monitoring institutions, in order to accelerate the socialization, marketization or private operation of Chinese environmental monitoring, since the 21st century relevant government departments have implemented some policies to carry out social trial projects for environmental monitoring and encouraged non-governmental environmental monitoring institutions to carry out environmental monitoring activities. For example, the *Pollution Source Automatic Monitoring Facility Operation Management Methods* (2008) has provided specific stipulations on the social operation of the environmental monitoring that “the state shall support and encourage the development of social operation service industry.” (Article VI). A few years ago, the Ministry of Environmental Protection of the PRC has started to formulate *Qualification Management Methods of Environmental Monitoring Institutions* and modify 2007 *Environmental Monitoring Management Regulations*, both of which include socialized and marketized policies and measures related to the environmental monitoring, but still not come into being so far. At the meantime, due to various historic and actual reasons, especially the environmental monitoring fields intervened by interest groups, and some implemented reforms including the socialization and marketization of the environmental monitoring tend to walk with difficulty, and no significant breakthroughs are made.

II. Content and Meaning of the Environmental Monitoring Mechanism Reform

Domestic problems on the environmental monitoring indicate the coming of environmental monitoring reforms.

In accordance with report of Xinhuanet Shandong Channel on August 4, 2012, since August in last year, automatic monitoring stations of air quality throughout Shandong will be entrusted to the “third-party” institutions for operation and comparison, and provincial and municipal environmental protection departments will jointly purchase monitoring data meeting the quality demand to guarantee the quality of air monitoring data and reduce the monitoring cost. As introduced by Shandong Environmental Protection Bureau, at present there are 144 air stations in 17 cities in Shandong and previous air quality data are monitored and distributed by the environmental protection department. According to the new operating mode of “Transfer-Operating” (hereinafter referred to as TO mode), the air quality monitoring will realize the management mode of “the paid transfer of

existing equipment, operation and maintenance by professional teams, mobility comparison of professional agencies, quality control and assessment of environmental protection department, and qualified data purchased by the government". The operation unit is responsible for purchasing the air station, operating, maintaining, and upgrading facilities; comparing units compare air stations in overall through mobile monitoring stations; provincial and municipal environmental protection departments control the quality and assess the operation units and comparing units, jointly contribute capital to purchase monitoring data meeting quality demand, and monitoring data are reserved by provincial and municipal environmental protection departments. Through the public bidding, Shandong has appraised and selected three operation units in Hebei, Qingdao and Xiamen, as well one comparing unit in Beijing. According to the prediction, as the new mode is implemented, the operating expenses of the air station will decrease 15% than that of the original mode. It symbolizes that Shandong takes the lead in transferring the automatic monitoring stations of urban environmental air quality to the third party, realize the professional and socialized operation management; it also indicates that Shandong has taken an important step in pushing the socialized and marketized operation of the environmental monitoring.

In order to push the successful implementation of TO mode, Shandong has specified relevant duties of provincial information and monitoring centers, municipal environmental monitoring stations, operation units, and comparing unit, guarantee the monitoring data quality, and reduce the monitoring operation cost. Shandong provides that provincial information and monitoring center is responsible for formulating the operation management, technical management systems, and documents of automatic air monitoring stations throughout the province; is responsible for the quality control of automatic air monitoring stations throughout the province, and organize the implementation of standard tracking and magnitude transfer; comprehensively monitor the operation and maintenance of operation units, and the mobile comparison behavior of the comparing unit; is responsible for investigating and verifying, handling and addressing monitoring equipment and monitoring data problems which are found from the monitoring and each city reflections, organizing the spot check and comparison of monitoring equipment with problems. Municipal monitoring stations should be responsible for monitoring the operation situation and monitoring data of automatic air monitoring stations in a real time manner; assistant provincial monitoring center in supervising the operation maintenance of operation unit, the mobile comparison with the comparing unit, promptly reflect the operation problems and data doubts to provincial monitoring center, but cannot interfere with the normal operation of the operation company. The operation unit should be responsible for guaranteeing the normal and steady operation and trouble-shooting of the monitoring equipment, and guarantee the operation rate of the monitoring equipment higher than 95% and the accuracy of monitoring date higher than 90%; daily monitor operation conditions and monitoring data of monitoring stations in a real time manner; respond to failures of the automatic air monitoring stations within 1 hour, recover the normal operation of the station within 3 hours, and report to the provincial monitoring center; report to the provincial monitoring center within 1 hour after the discovery of abnormal instrument and equipment monitoring data. The comparing unit should follow demands of the provincial monitoring center, and conduct the synchronous monitoring of the fixed station, and guarantee the comparing ratio of the monitoring equipment not less than 95% and the compared accuracy rate not less than 90%; and be responsible for guaranteeing the normal and stable operation and trouble-shooting of mobile stations.

From the perspective of reform measures in Shandong, Shandong's reforms in environmental monitoring not only conform to relevant provisions in relevant laws, regulations and policy documents such as *Pollution Source Automatic Monitoring Facility Operation Management Methods* (2008), but also further detail and materialize the content related to the socialized environmental monitoring in *Pollution Source Automatic Monitoring Facility Operation Management Methods*. Therefore, the direction and experience of reform is worth learning.

III. Several Problems of Domestic Environmental Monitoring Mechanism Reform

According to existing problems in national environmental monitoring and relevant experience in environmental monitoring reforms in Shandong, the author thinks that the reform of national environmental monitoring mechanism should pay attention to the following problems:

Firstly, the environmental monitoring should adopt the mode governed by the government, the mutual operation of the government and the market, and the mutual production environmental monitoring information of the government and the society, namely, the co-monitoring mode of environmental monitoring institutions (environmental monitoring stations called environmental monitoring agencies) directly led by governmental environmental protection administrative departments (environmental protection bureau) and nongovernmental environmental monitoring institutions with environmental monitoring qualifications (hereinafter referred to as non-governmental environmental monitoring institutions). Environmental monitoring career mainly refers to the fundamental non-profit work of national economic and social development; environmental monitoring products refer to environmental monitoring data or environmental information, and the environmental information is mainly a public object or article; the environmental monitoring work is an important part of people's governments at all levels to perform the environmental monitoring function and

carry out environmental management work. Therefore, the government should become the primary provider of the environmental information, an environmental public object, the primary supervisor of the non-profit work, and plays the dominant role in organizing and developing the environmental monitoring. However, although the government is the primary provider of the environmental monitoring information, it is not equivalent to the primary producer of the environmental monitoring information. Thus, the government should determine the reasonable ratio and fields of government production, social production environmental monitoring information according to the actual situation of environmental protection, economic and social development, and meet various state and social demands for environmental monitoring information. The country should carry out necessary environmental monitoring so as to implement environmental supervision and management, evaluate the situation of environmental quality, determine the pollutant discharge, monitor the change in environmental conditions, and test the effects of environmental protection work. The government should retain and strengthen necessary construction of environmental monitoring institutions as the state-owned asset directly managed and led by the government, and enhance the accuracy rate of environmental monitoring data. In accordance with relevant laws, the environmental quality monitoring, supervisory monitoring, "Three simultaneities" inspection and acceptance monitoring must be conducted by relevant environmental monitoring institutions. In addition, other environmental appraising and monitoring, enterprise entrusted monitoring, enterprise self-inspection, certification and monitoring can gradually be shouldered by social monitoring institutions. It must be noted that in accordance with relevant provisions in existing laws, regulations and policy documents, enterprises and public institutions can conduct environmental quality monitoring qualities within the scope managed by the unit, and the pollutant discharging unit should monitor the pollutant discharging situation by itself. Therefore, some enterprises and public institutions in China have possessed powerful environmental monitoring technologies, equipment, team and institutions, and the environmental monitoring power of some large and medium enterprises have exceeded the environmental monitoring ability of administrative competent departments, of county-level people's government. If non-governmental environmental monitoring institutions are prohibited from participation, are not made full use of and given a role to play, it's actually a waste of environmental monitoring resources of enterprises and public institutions (including environmental monitoring technologies, equipment and personnel), which will influence the environmental monitoring ability of enterprises and public institutions and Chinese environmental monitoring career development in a bad way. In consideration of this, the author proposes that relevant environmental monitoring laws and regulations in China should provide that some environmental quality monitoring can be shouldered by institutions obtaining the environmental monitoring qualifications, and some pollution source monitoring can be conducted or entrusted institutions with the environmental monitoring qualifications by the pollutant discharging unit.

Secondly, the environmental monitoring operation mechanism reform should benefit the achievement of environmental monitoring objectives and tasks. Environmental monitoring data is the basis for the state or regions to formulate environmental protection laws, regulations, policies, and plans, and is the basis for people's governments at all levels to make decisions on environmental management, environmental protection supervision and enforcement, and is the important information source of people's governments at all levels to regularly publish environmental quality conditions and guarantee citizens' right of knowing environmental information. The environmental monitoring aims to accurately, promptly and comprehensively reflect the environmental quality conditions and development trade, and provides the scientific basis for the environmental management, pollution source control and environmental planning. The environmental monitoring operation mechanism cannot deviate from objectives and tasks of the environmental monitoring, and should better meet the objectives and tasks of the environmental monitoring. Firstly, it helps enhance the environmental monitoring quality, especially the monitoring data quality, improve the data accuracy rate, and give the full play to the role of environmental monitoring information (data). The reform of environmental monitoring system and operating mechanisms should help guarantee the science, standardization and accuracy of environmental monitoring data, help establish and implement the environmental monitoring reporting system, build and perfect the sharing and distribution mechanism of environmental monitoring information, and guarantee citizens' right of knowing environmental information. Secondly, it helps reduce conflicts occurred in environmental monitoring between all administrative departments due to department interests, unify the power of all administrative departments, reduce conflicts between upper and lower environmental protection administrative departments and unify the power of upper and lower administrative departments. Thirdly, it helps overcome the malpractices of integrating the government and enterprise, reduce the administrative interference, especially the inappropriate intervention of the local government, overcome the local selfish departmentalism, and eliminating problems such as the direct government leadership of operation, monitoring expense and monitoring personnel's wages allocated by the government financial department. Fourthly, it helps strengthen the assessment and supervision of the quality control of environmental monitoring information such as the environmental monitoring information by the environmental protection administrative department (quality control work), make the supervision more powerful, and make the law enforcement more effective. The non-profit feature of environmental monitoring and environmental protection work has decided that the environmental monitoring market cannot purely seek for the maximum profits, and should be aimed at the public benefit from the environment. In this sense, the function of government

environmental departments after the environmental monitoring marketization should be strengthened instead of being weakened. Fifthly, it helps enhance the environmental monitoring efficiency, reduce the monitoring cost, and increase the operation rate of environmental monitoring equipment. Sixthly, it helps promote the development of environmental monitoring institutions, expand the scale of environmental monitoring institutions, and give the play to environmental monitoring personnel's zeal, take the advantage of environmental monitoring technologies, improve the professional advantage of environmental monitoring, increase the asset of environmental monitoring institutions, strengthen the competitiveness of environmental monitoring institutions, extend the ability and scale of environmental monitoring services, and make the environmental monitoring industry larger and stronger.

Thirdly, various feasible operation management modes should be adopted to promote the socialization and marketization of the environmental monitoring. National environmental monitoring management system and operation mechanism reform are oriented towards socialization and marketization, and the socialization should include two aspects of environmental quality monitoring and pollution source monitoring. At present, *Pollution Source Automatic Monitoring Facility Operation Management Methods* (2008) has specified the socialized operation mechanism of pollution source automatic monitoring, and Article 26 in *Pollution Source Automatic Monitoring Facility Operation Management Methods* (2008) provides that the operation units mentioned in this method include the socialized operation units and self-operation units. The socialized operation refers to enterprises or public institutions under enterprise-style management which has obtained the "environmental pollution governance facility operation qualification certificate" issued by the State Council environmental protection competent department and owned the qualification of the independent legal entity. They are entrusted by the pollutant-discharging unit and provide automatic monitoring facilities for operation, maintenance and management to guarantee the normal operation of facility and shoulder corresponding operation and service activities of environmental responsibilities. The self-operation refers that the pollutant-discharging units operate, maintain and management automatic monitoring facilities, guarantee the normal operation of facility and shoulder corresponding activities of environmental responsibilities. But the socialized operation of the environmental quality monitoring has not been determined yet. The environmental monitoring system and operation mechanism reforms involve multiple systems problems at deep levels, and are faced with strong resistance of vested interest groups, so it has been implemented from easy one to the difficult one and in progressive steps. For example, the reason why Shandong selects the air automatic monitoring to implement the socialized and marketized operations is that as early as in 2008 Shandong took the lead in launching the automatic environmental monitoring system and has realized the all-weather monitoring of key pollutant-discharging units, and major water and gas environment; the property right of air automatic stations is relatively clear and owned by provincial and municipal environmental departments, so the operation of property right transfer is relatively simpler; besides, the automatic air monitoring technologies are comparatively mature and its socialized operation mode in world is relatively compete and easy to promote. Therefore, Shandong province decides to start from the reform pilot project of the operation mode of automatic environmental air quality monitoring station and implement the socialized and marketized environmental monitoring. Environmental monitoring operation management mode is a major factor influencing the monitoring data quality and is an important issue involved in environmental mechanism system, so the effective and feasible operation mode should be adopted in accordance with actual situations. In terms of the socialized operation mode of environmental monitoring, the TO mode adopted by Shandong province is an applicable and effective mode. Such mode mainly includes five aspects: "the paid transfer of existing equipment, the operation maintenance of professional groups, the mobile comparison of professional institutions, the quality control and assessment of environmental protection departments, and the government purchase of qualified data". i.e., the government selects the socialized institutions through public bidding (the "operation unit" in non-governmental environmental monitoring institutions) to purchase air stations in the pilot city and be responsible for the operation, maintenance and equipment upgrading. The socialized institutions winning the bid (the "control unit" in non-governmental environmental monitoring institutions) will compare the air station data in overall through mobile monitoring stations; provincial and municipal environmental protection departments control the quality and assess the operation units and comparing units, jointly contribute capital to purchase monitoring data meeting quality demand, and monitoring data are reserved by provincial and municipal environmental protection departments. As a matter of fact, this mode is the reform of environmental monitoring management system and working mechanism, has the supervision and management of environmental quality managed by the upper level, further strength the provincial macro-management function, avoids the intervention of local administration, and improves the quality of environmental monitoring data; has the monitoring of pollution source management by the lower level, and environmental protection departments at three levels of province, city and county joint hands to supervise pollutant discharging units and fully arouse the enthusiasm of municipal and county-level micro-management. This is beneficial to the scientific division of management duties of provincial, municipal and county-level environmental protection departments, and makes the right and responsibility more clear; this is beneficial to enhance the quality of monitoring data, strengthen the environment supervision, and reduce administrative cost. We should advocate, support and gradually reinforce the socialized operation of

environmental quality supervision.

Fourthly, we should intensify the legal construction of socialized and marketized environmental monitoring. We should formulate and modify relevant environmental monitoring laws and regulations, establish policies, measures and systems related to the socialized and marketized environmental monitoring. Citizens, legal persons and other organizations have the right to monitor environment in the land (such as diggings, plant, campus and other working, laboring fields and residences, etc) with the land use right, and its monitoring data is mainly used by themselves. Standardize the environmental monitoring behavior through laws and regulations, define the qualification authentication conditions of environmental monitoring institutions, market access conditions, monitoring activity scope, monitoring expenses methods, monitoring information access, arrangement, storage, reporting, publication, exchanges, disclosure and checking methods and systems of environmental monitoring institutions, and provide stipulations on the identification, authentication and treatment of controversial environmental monitoring data. We should establish the access system of strict environmental monitoring institutions to guarantee the justice and seriousness of the environmental monitoring. The environmental monitoring institutions should be examined by relevant environmental protection departments, obtain the environmental monitoring qualification certificate, and work on environmental monitoring activities in accordance with the grades and monitoring scope specified by the qualification certificate. We should establish the system to prevent environmental monitoring institutions from monopolizing the environmental monitoring market, introduce the market competition mechanism into the environmental protection field, guarantee the just competition of environmental monitoring market players, promote the structure adjustment and optimization of environmental monitoring institutions, make environmental monitoring institutions get ride of administrative intervention and become main market players. If overseas organizations, individuals of social environmental monitoring institutions (units) or domestic organizations and individuals that carry out scientific cooperation with overseas need to work on environmental monitoring activities within the PRC territory and other waters governed by PRC, and disclose environmental monitoring information related to the environmental quality, they should be approved by State of Council environmental protection departments in accordance with laws, and should abide by relevant provisions of PRC laws and regulations can not involve PRC secrets and can not harm the national interest. We should encourage non-governmental environmental monitoring institutions to actively participate in the environmental monitoring and taking policy measures of environmental monitoring activities. We should formulate and implement economic incentive policies and measures such as credit, land use, price and charges, accelerate the construction of all-around policy incentive mechanism and diversified investment and financing mechanisms in environmental monitoring service industry, guide, drive and support the development of non-governmental environmental monitoring institutions. Environmental monitoring institutions should conduct the environmental monitoring work in accordance with specified environmental monitoring technical specifications (refers that the environmental monitoring activity shall adopt state or local criteria related to relevant stationing, sampling, sample transportation and storage, analysis and test, data processing, analysis evaluation and report writing, etc.) We should specify the legal responsibility of environmental monitoring management department, governmental environmental monitoring institutions and non-governmental environmental monitoring institutions, for example, the legal responsibility for forging and changing monitoring data, and investigate and affix the legal responsibility for those in violation of legal provisions and legal systems.

The History, Current Situation and Reformation of the Chinese Environmental Monitor Mechanism

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Abstract: Environmental monitor is a basic way to understand, control, evaluate and predict the quality of environment. On the other hand, the environmental monitor mechanism, including the framework of monitor organizations and institutes, the monitor mode, the standard of monitor techniques, the application of monitor information and the management system of monitor, ensures and regulates the effective operation as well as sustainable development of environmental monitor. There are various problems in our environmental monitor mechanism while we are making significant progresses. Issues related to the monitor information of production environment from government and environmental monitor mode organized in a central planning manner, such as exorbitant costs of environmental monitor, low accuracy of data, inefficiency, lack of creativity, small scale, and the difficulties in developing non-governmental monitor site, etc., are good cases in point. In order to perform the reformation of environmental monitor mechanism, a mode led by the government, cooperated by the government as well as the market and which generates

environmental monitor information together by the government and the society is a preferred method to be adopted in china. In other words, it is a modality that allows the environmental monitor institutes to be led directly by the environmental protection department of the government and the coexistence of both governmental and nongovernmental environment inspection institutes. Different environmental monitor management patterns should be utilized to facilitate the socialization and marketization of monitoring and to strengthen the construction of relevant law.

Key Words: Environmental Monitor; Mechanism of Environmental Monitor; Environmental Quality

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Cultural Traditions, Institutional Innovation and Japan's "Quality Miracle"¹

Zhang Xingjiu, Yan Shuai

Abstract: From the perspective of the structural functionalism, the Japanese "quality miracle" is the product of the combination of cultural traditional and system innovation. This includes three levels: the unique Japanese cultural tradition at the deep level shaped by the national living attitude and values; various government regulatory systems at the macro-level, such as supportive system and punitive system, etc; the scientific management system of various social organizations at the middle level, such as the enterprise lifetime employment system, seniority-based wage system, employee centralism, and comprehensive quality management system, etc. The orderly existence and interaction of three levels jointly push the development and progress of the Japanese quality management.

Keywords: Japan; Quality Management; Cultural Traditions; Institutional Innovation

I. Literature Review and Problem Description

It's widely known that two countries famous for quality in world: German and Japan. After the world war, Japan has rapidly risen to a large economic giant, which is greatly related to the "quality miracle" in product and service. What is causing this "miracle"?

Centered on above issue, scholars have published lots of works and relevant studies lay a particular emphasis on Japanese modern quality control system and system specification. In general this includes two aspects: one is the government regulation system at the macro-level, and the other is the corporate governance structure at the micro-level. In terms of the government regulation, scholars invariably point that the Japanese quality miracle results from the extensive government regulation, and the government intervention can not only rectify and improve the market failure through, but also protect and support relevant industries. In terms of Institute of Japanese Studies, CASS Research Group (1994) point that the Japanese economic development and quality miracle can be summarized as one "institutional innovation", namely, as a capitalist system country, Japan introduces factors of socialist system, and adopts some socialist adjustment methods". Mang Jingshi (2001)'s relevant studies have explained reasons for the emergence of Japanese government regulation, and he pointed that after the post-war constitutional reform, Japan has become a "bureaucratic pluralism country with the tendency of authoritarianism, and the long-term alliance of political parties and bureaucrats have caused a political structure with relative concentration of power, and shaped the bureaucratic control during the actual political and economic process". However, this political system has developed the Japanese government' strong bargaining ability, so it has great advantages in coordinating the enterprise relationship and promoting the economic development. Che Weihai (1998)'s relevant studies have introduced the concrete content of Japanese government system and he points that the Japanese economy and quality miracle lies in the government intervention in the economy, and those intervening measures include "formulating economic plans and providing information; adopting real-time and flexible financial policies; balancing and coordinating industrial policies, the government applying administrative guidance to enterprises". In addition, the *Analysis of Japanese SME Technical Innovation and Government Regulation* by Xu Chaoping and Qin Yong (2001) and the *Discussion on the Role of Government Regulation on Enterprise Development* by Tan Shanying (2002) have argued the role of government regulation on guaranteeing product and service quality in detail from the microscopic perspective and through specific cases. In terms of the corporate governance structure, there are rich relevant studies, for example, *Explore Japan* by Du Daozheng, *Japanese Market Economic System: Reform and its Direction* by Chen Jianan, *Brief Discussion of Japanese Enterprise Governance Structure and its Reform Trend* and *Japanese Enterprise Governance Structure: the Deviation from and Regression to American Mode?* By Mang Jingshi, and *Functions of Stock Company System, Advantages and Disadvantages of Stock*

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Market-Thoughts about Features of Post-Japan Stock System by Hu Xinxin. Therein, the most representative study is the *Vigor of Japanese Economy* compiled by Institute of Japanese Studies, CASS (1998), in which features of Japanese enterprise governance structures are summarized as five points: (1) compared with other capitalist countries, the separation of ownership and operation of Japanese enterprises is more radical, in which way enterprise operators are freer and suffer less pressure of participation in profits demanded by shareholders, so they have more time to think about the long-term corporate development. (2) The Japanese enterprise operation mode of three pillars with the lifetime employee system, seniority-based wage system and labor union organization by enterprises make the enterprise a well unified organization, and become a system completely mastering employees through various links such as employee recruitment, training, welfare and promotion. (3) In Japan, an almost religion-like social ethic of "loyal to the enterprise" is formed. (4) Compared with the pre-war situation, post-war Japanese enterprises have not only eliminated the status hierarchy difference and special income gap of internal corporate personnel, but also the income difference inside the enterprise is obviously weaker than that in capitalist countries such as USA. Obviously, the equalization inside enterprises is the essential requirement of modern corporate development. (5) For the sake of the strategic development objective of long-term development, Japanese enterprises think that the demand of seizing market share is more important than making profits, and regard the market share as the key indicator of operation conditions.

I can not agree more with above scholars' research conclusion that the system standardization plays a crucial role on guaranteeing the product and service quality. In addition, the author thinks that if one country can continuously provide outstanding products and services, it means that a majority of citizens have the durable and strong quality-oriented work ethics, but such quality-oriented working ethic is supported by specific life philosophy and life concept. Therefore, the discussion of Japanese quality issue can be expanded to Japanese's work ethics and the discussion of life attitudes and values behind it. Therefore, the author thinks that the successful Japanese quality management is actually an overall success, and constitutes the standard system of the entire society, which includes the result or "function" of the mutual action of internal specification (values based on cultural tradition) and external specification (formally implemented management system). Poisoned at the deepest level of the standardized system is the national life attitude and values shaped by the unique Japanese cultural tradition; positioned at the middle level is the scientific management system in various social organizations, such as the enterprise lifetime employment system, seniority-based wage system, employee centralism, and comprehensive quality management system; positioned at the surface or macro level is the various government regulation including the supportive regulation and punitive regulation. The interaction at three levels has jointly built Japanese quality ethics and world-famous quality achievements. In another word, such Japanese "quality-oriented work ethic" is not only the result of long-standing cultivation and development of historic and cultural traditions, but also the discipline role of scientific and reasonable external management system. Let's take a concrete discussion on this issue.

II. "Experiment Mode" of Cultural Spirit and Japanese Quality Management

The Japanese cultural tradition include some concept capital with a great impact on modern Japanese management, such as the loyal concept, the spirit of group cooperation, clear awareness of rules and standards, the diligent and professional ethics, the work attitude of carefulness and pursuing excellence. Obviously, those concepts are influenced by Chinese Confucian culture, and are shaped by the unique Japanese social and historic conditions. Such creative shift in Japanese native culture is of far-reaching significance on national work ethics and quality awareness.

(I) The Concept of "Loyalty" Shapes Japanese "Obedience" and Rule Consciousness

Although the concept of "loyalty" in Japanese culture originates from Chinese Confucianism, its implication in Chinese and Japanese value systems is quite different, so are its social and political functions. Although the direct implication of "loyalty" in traditional Chinese political ethics is the "loyalty to the Monarch", such "loyalty" is under the premise that the monarch is capable of "enforcing justice on behalf of heaven", benefiting and protecting the people. Otherwise, as the Mencius says that if the monarch fails to behave like a "monarch", and regards the people as "useless", his people won't be loyal, and even look on the monarch as the "enemy"; if a minister doesn't follow the conscientious judgment and always cater to the monarch's will disregarding the natural law and the people's will, it's not called "loyalty", but is the practice of the "despicable person" and crafty base person. That is why some historic figures such as Qin Kuai, Yan Song, and He Sheng are favored by the Emperor before death, but are denounced as courtier and treacherous ministers after death by historians. Therefore, the "loyalty" in Chinese culture isn't absolutely unconditional, but is essentially the "loyalty" based on the conscientious judgment and monarch grace. But in Japan, the ethic of "loyalty" has gradually evolved to the absolute and unconditional "loyalty" and obedience to the Monarch or Emperor. This is firstly related to the political structure centered on the Japanese Emperor System and aristocratic hierarchy. The difference is that Chinese Emperor is still governed by "heaven", but the Japanese Emperor is the supreme god with no "heaven" above him, so the Emperor represents the supreme level of the justice (オホマケ) in court (Mizoguchi Yuzo, 1995). Therefore, the Emperor is absolutely supreme and is beyond any doubt. Such absolute Emperor system has erected the absolute concept for the Japanese, namely, the ideological concept of absolute obedience and absolute compliance of principles and authority. The aristocratic hierarchy

matches the Emperor system, and is a aristocratic hierarchy constituted of staff and Pans, and the actual supreme power is held by the office of the commanding officer, followed by Pan, warriors, and farmers; at the meantime, the ranking of “scholar, farmer, artisan and merchant” is rigorous and distinct. Under such vertical hierarchy, the Japanese “loyalty” and obedience consciousness are shaped, and national citizens are loyal and subject to the Emperor and the subordinate to superior aristocrats in hierarchy system. The formation of such “unconditional loyalty” is also related to the introduction of Zen. Influenced by the concept of Zen by means of “selfless” and “buddhahood upon enlightenment” after death, the “awareness of death” occurs in traditional Japanese culture and its ethic of “loyalty” is gradually stepping towards the absolutization. In the final analysis the Chinese “loyalty” is the faithfulness to the self-conscience, but the Japanese “loyalty” is the sincere devotion to the Emperor, unconditional and uncensored devotion spirit, the fear of consciousness and obeying spirit (Liang Shuming, 1987).”

Although the “loyalty” in Chinese culture makes people keep conscientious freedom and independence in the face of authority (especially the brutal monarch power) and display certain culture transcendence spirit, it hands the right of judging loyalty and disloyalty to the subjective “conscience” and “intuitive knowledge”, so in case of subjective judgment problem, such “loyalty” is reflected as “act willfully”, think oneself clever in practices. With more such people, the rule and regulation, laws and quality standard will be difficult to implement. The Japanese “loyalty” seems to be ignorant and arbitrary, but in modern transformation, it implies the awe and obedience awareness of abstract rule and system, laws and authority, strict rule consciousness of abiding by rules and regulations, and it naturally combines with the modern enterprise system and administrative system to play an active role. It’s under the influence of such awe, obedience awareness and rule consciousness, the Japanese is able to cultivate the thought and behavior habit of keeping loyal to enterprise and government organizations, remaining subject to the superior and abiding by rules and regulations, the responsible and hard-working spirit and rule consciousness in the interest of the public and enterprises, and finally it is manifested as the strong quality awareness and consciousness of responsibility, and then provide the best product quality and service. The Japanese always leaves us the impression of sticking to conventions, and even seems inflexible and clumsy, which is caused by their rule consciousness to a large degree.

(II) “Community” Sense Shapes the Japanese’s Group Identification and Cooperation Spirit

The quality awareness also means a kind of values and life attitude emphasizing the entire social benefit and group benefit. If one person is selfish and unrestrained without the universal consciousness or group consciousness, he’ll do things carelessly, cheat on workmanship and materials, manufacture roughly, and harm others to benefit him. However, Japanese quality awareness is closely related to their group-oriented values. In history, the development of such community sense and group consciousness is mainly influenced by its social and political structures. In the hierarchy aristocratic system in Japan, one person is born to be in some Pan and some field, and obvious boundary between those Pans and fields, so it’s easy to build the clear community sense. In addition, villages in Japan are more independent than those in China. It can be found from the country structure of Japan and China that there is basically no institutional obstacle in the free mobility and demolition of rural areas. Under the condition of free land sale, after one person purchases the farmland in some place, it can move into this place, and in this way Chinese rural areas are of more obvious openness and mobility; but in traditional Japanese rural areas, strong community sense and anti-foreign sense are built, so strict systems of rules are established in villages, and strict constricts are imposed on internal members’ behaviors; meanwhile, the immigration of foreign persons are repelled, so the community has strong self-discipline and closeness, which is also beneficial to the development of Japanese group awareness. As such group consciousness is carried down to the modern times, it’s easy for the Japanese to develop the strong sense of belonging and the responsibility for public affairs in government and enterprise organizations, in which way in terms of the relation between individuals and community, specially the enterprise community, Japanese pays more attention to the value and benefit of the group and community, and tends to obtain life sense of value and meaning from the group. In 1995 Hanshin earthquake occurred, many Japanese’s first reaction is to run back to company instead of home; seeing their home into the ruins, Japanese didn’t cry, but at the sight of collapsed company, many people cried out involuntarily, from which it can be seen that how important companies are to Japanese! Under the influence of such group consciousness, it’s easy for the staff to develop the idea of enterprise as home, and regard the social organization where he serves as the “fate community” going through thick and thin, so it’s easy for them to develop the strong sense of belonging and clear awareness of responsibility, the “worker bee” spirit of diligence and bearing hardships, the attitude of sharing weal or woe with enterprises and pursuing perfect quality to provide superior products and services. At the meantime, such group consciousness benefits the cultivation of group work and cooperation spirit between people. Against the background of modern assembly line operation, a high-quality product results from the mutual coordination and cooperation of each process and each personnel, but the Japanese spirit of strong sense of belonging and mutual cooperation is favorable for the pursuit of superior products and modern service management.

(III) “Duty” Thought Shapes the Japanese Professional Ethics and Careful Attitude

If one enterprise and even a society can continuously (not accidentally or forced) provide excellent products and services, it means that most social

members owns a concentrated and intensive working attitude, and embraces a professional attitude and occupational seriousness by carefully and seriously handling each work, gaining the satisfaction and pleasure. Although Chinese culture, especially the Confucian thought also includes concepts of "the act of respect", "seriousness" and "duty", they have produced certain active impact on the development of China's professional spirit. But in general, as what Mou Zongsan (1991) (a new contemporary representative of Confucianism) points that "Chinese culture is too romantic and heroic, but the spirit of cause and contribution is not enough. It emphasizes the pursuit of magnificent objectives, great career, and lacks the spirit of honestly doing well in "mediocre" things". This makes Chinese people relatively lack of professionalism. As an island country with a small territory, Japan is short of resources and has been suffering from earthquake and fire disasters, so due to such geographical environment and national situation the Japanese has developed strong awareness of unexpected development and sense of crisis; at the meantime, it also promotes them to take a road of pursuing small and precise connotative development, and cultivate the spirit of doing well in small things and making waves in teapot. Moreover, Japanese working attitude and professional spirit are also related to the unique religious culture. Japan is a polytheism and pantheism country, and the Japanese think that all things have the moral and spirit. In this way, each thing is endowed with the sacred meaning. However, the "duty" thought of the Japanese Buddhist plays a crucial role on Japanese professional spirit. At first, from the Baizhang Zen Master in Tang dynasty, the Buddhist has begun to advocate "no work in a day, no food in a day", and emphasizes that the world is the universal law. "Fetching water and cutting firewood have no excellent ways", as long as you take each work seriously, everything regardless of big or small can become Buddha, and each thing contains "moral" and has the sacred meaning. Starting from this thought, the Zen Buddhist Suzuki Shosan in the end of the Warring State of Japan also proposes the "duty" of "any occupation is in Buddhist industry", and thinks that "the world law is the Buddhist law", "the Buddhist law is not different from the world law" "thought and wish of study"), "the Buddhist law is the same as the world law", so as long as he's devoted to the daily occupation life, it's the practice of Buddhist law. In addition, he advocates the true spirit of Buddhist law in common life. If the business men do not violate the tenet of integrity, their economic activities are reasonable. If farmers spare no effort to sow, farm and harvest, it's also the way to learn and practice Buddhism. Just under the influence of such ideological tradition and historic conditions, it's easy for them to establish the sense of the sacred and respect, and work conscientiously and meticulously. I'm afraid that Japanese will agree with a saying of "Japanese have no trivial things", and it's easy to have an impression of "mean" Japanese. Such "mean" style is often ridiculed by our colleagues, but when such "mean" style is applied to the work, the Japanese can do well in each "trivial" thing, take each "trivial thing" seriously, and show the meticulous and hard-working professional spirit and working attitude. It's just with such "mean", they have been pursuing excellence in work, and practicing a principle of perfectionism, enjoying the work and pursuing art during work. So to say, such serious, careful, diligent and professional attitude and spirit is the reason for the Japanese quality miracle.

Just as disclosed by new institutionalism, as a regulation system realizing social orders, the institution includes two basic levels: the internal rule system (internal institution) and external rule system (formally issued external institution). Therein, the internal rule system mainly includes values, beliefs, moral ethical norms, customs and practices, and they have constituted the basis of various formal systems or "priori mode". In fact, various form institutions are the formal confirmation of internal social rules, and not arbitrarily "formulated" (Wei Sen, 2005). Therefore, if a society doesn't have the "social capital" stock of basic moral ethical norms, its formal institution will have no life no matter how perfect it is. Some life philosophy, values and work ethics incurred therefrom in above Japanese cultural tradition is the soul and foundation of Japanese quality management normative system.

III. Government Regulation and Macro-Level Quality Management in Japan

Although work ethics in the Japanese culture constitute the soul and foundation of Japanese quality specification, such "internal rules" take effect relying on staff's moral self-discipline, so it's unavoidably ambiguous and flexible and has the possibility of inducing opportunistic opportunism behavior. In addition, under the condition of market economy, the product and service quality has various problems such as externality, natural monopolies, incomplete competition, unsymmetrical information and risks, so without the appropriate government intervention and regulation, social organizations such as enterprises cannot guarantee the supply of excellent services and products, and then it may harm the society. Based on the ambiguous feature of "internal rules" and the failure of "market mechanism", the government supervision and regulation as "external rules" are necessary and essential. Thus, how does the Japanese government play the role of regulation and supervision on quality problems?

(I) The Premise of Government Regulation: the Coordinative Government-Enterprise Relation

It's widely known that due to many complex historic and social reasons, the relationship between the Japanese government and enterprise is quite

1 In Japan the law is formulated by each ministry and modified by the parliamentary. The law should be made by the parliamentary, but all government ministries only act as the executor, but the Japanese bureaucracy plays a dominant role in the law formulation.

unique. It's neither the simple relationship of the government regulating the enterprise, nor the relationship of the government letting the market alone featured by the "negative country", but is a "coordinative mode" of government-enterprise coexistence dominated by the government which falls into between above two relationships. Under such mode, the diversified or multi-channel coordinative communicating and regulating relationship is formed between the government and enterprise. For example, at the macro level, the government actively gets involved in enterprises through various corporate laws, regulations, and financial policies" (Lee and Yamazawa, 1990) At middle and micro levels, the long-term information communication and coordinating relationship is formed between all government ministries and governed private enterprises and public institutions, and it's prominently manifested that with the industry as the unit, industrial groups and governments get involved, and department called "original bureau-original division" is established according to industry classification to handle dealings with enterprises and form one industrial coordinative development system of "relation-type control system" (Sun Li, 2008) or "integration of leaders and citizens" (Wang Dexun, 1998) Figure 1 has displayed the frame structure of the communication and coordination between Japanese government and enterprises, and this frame structure has the following characteristics: (1) strict division of jurisdictional limits between all government ministries, and long-standing relationship between all ministries and private enterprises and public groups within the jurisdictional limit; (2) The "government-enterprise relationship" in the Japanese economic system is handled by industrial groups representing the industry and original bureau · original division of all government ministries representing all government ministries according to the industrial classification, and it's specifically shown by dotted lines in the figure; (3) The right to formulate Japanese policies is distributed in all industrial departments and corresponding industrial¹ fields, so different departments can coordinate with each other and hold the equal status. Namely, the government ministries with a close relationship with enterprise plays the dominant role in the law formulation; (4) The relationship between Japanese companies and central government has been famous for friendliness, so the bureaucratic government mainly enforces laws in the manner of "administrative guidance", and conferences between officials and enterprises beyond law provisions are countless, and the government regard itself as the promote of domestic industries instead of the impartial and incorruptible governor.

According to above features, we'll clearly draw the outline of a Japanese government image "owning the policy (even law) dominant right, getting along with enterprises, and knowing business movement; meanwhile, it tells us that during the policy formulation, the government and larger enterprises maintains close cooperation. The implementation of a series of policies including industrial policies and regulation systems is absolutely not the result of the unilateral government plan action, and the government has also participated in and influenced the policy formulation to some degree. World Bank 1994 report evaluates that there is a bureaucratic institution of strong ability and less unfair behaviors in Japan, which maintains relative independence under the political pressure, and uses the review conference to exchange reports and coordinate with private enterprises. Therefore, it's not difficult for us to image that under the condition of such smooth information exchanges, close government-enterprise relationship, and knowing yourself as the enemy, the government can work out the reasonable and effective industrial policies and regulation standards conforming to the enterprise development. Thus, the coordinative government-enterprise relationship is the premise of the Japanese government regulation.

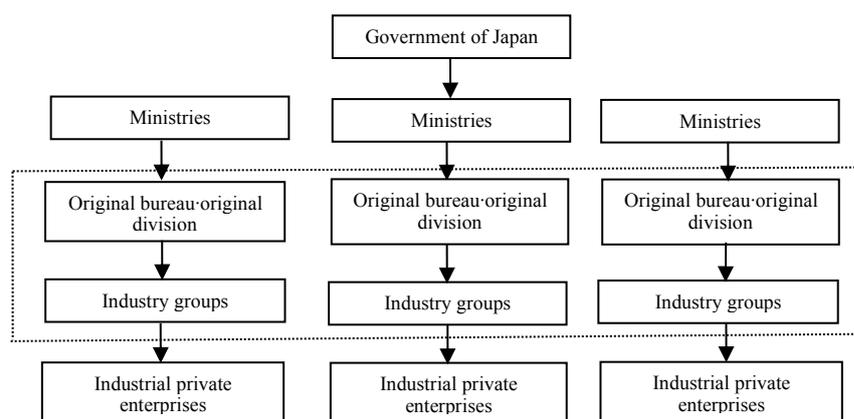


Figure 1 Japanese government - business negotiation framework

(II) Government regulation guarantee: sound law system and standard

In order to guarantee that enterprises and all social organizations are able to provide good products and services, the government plays a unique legal role in terms of regulation functions, and relies on the strict and sound legal system to comprehensively supervise the production and services in all fields. From the perspective of the national regulating role, the Japanese *Dongyin Weekly Journal* once pointed in the reported dated July 20, 1995 that "Japanese economic fields restricted by national limits in 1990 account for 41.8% of all economic fields, but USA at the same period only account for 6.6%". Thus, compared with other developed countries, Japan is the most regulated country. Horizontally speaking, those regulating laws have covered almost all Japanese production and service fields including electric power, railway, communications, food and commerce; longitudinally speaking, those regulating laws are involved in all links from production to processing and to sales, including the market access (certification licensing), production equipment increasing, importing and market sale price, etc (Mang Jingshi, 2000).

There are two reasons for sound Japanese regulating laws: on one hand, this is the internal demand of regulating. The so-called regulation mainly refers that by the means of laws, regulations and systems, the micro-economic players and their activities are directly standardized, stimulated and restricted, and inborn defects of market economies are modified to lead the sound social development. Thus, one important regulation feature is "the system dependency" and it adopts the existence of laws, regulations and institutions as the premise and important means. Only with the existence of those laws, regulations, and systems, can the government intervention in enterprises and economic behaviors be legal and reasonable; on the other hand, this is the inevitable result of Japanese quality management concept. From the perspective of the period of regulating means implementation, the regulation can be divided into two stages: prior-event regulation and post-event regulation. The prior-event regulation is mainly manifested as the formulation of performance standards, specification and deviation pre-warning system; the post-event regulation is mainly manifested as the confirmation and supervision of the specification and standard maintenance. However, the quality itself has the characteristic of public security, and once the injuries happen, the injuries cannot be compensated. Therefore, in terms of the quality management, the Japanese government lays a special emphasis on the "pre-event regulation" and expects to take the advantage of "striking first" through "preventing the administration". Under the guidance and induction of such management concept, the regulating laws especially emphasize "law first and nipping in the bud". Therefore, it stands to reason that Japanese regulating laws are sound, and provide institutional support and guarantee for the successful implementation of government regulation.

(III) Government Regulating Means: the Simultaneous Application of Supportive Regulation and Punitive Regulation

We know that the government regulation of the enterprise is divided into punitive regulation (rectification) and supportive regulation (improvement). In terms of the supportive regulation, some scholars think that the Japanese government support and assistance of enterprises is the foundational reason for the long-term and repeated implementation of Japanese quality management (Zhang Xiumin, Gao Shujuan, 2006). These support and assistance mainly includes: (1) while letting go enterprises for competition, actively prepare the tumbling-type long-term plan to guide and adapt to enterprises' development demand. (2) The Japanese government grants the enterprise support and assistance with the economy as the lever (including tax income, credits and economic legislation, etc), and the government has established Japanese banks' "escorting ships" method and main bank system through various regulations to directly control the banking and financing industries, and then carry on various loan support and industrial fostering through banking and financing industries. (3) Japan applies special supporting policies to SME, encourage them to improve the quality and develop towards the professional direction. In order to resolve various problems such as the difficult SME funding, the Japanese government has established professional institutions and formulated professional laws and polices (see Table 1); in addition, it also grants supports in labor resources, technical information and raw materials to coordinate the relation between giant enterprises and SME. (4) Japan adopts the "country construction through technology" and endeavors to enhance the technical content of products. In consideration of the above, the government has increased the percentage of technical development expenses in the GNP from 1.7% to 3%, increased the percentage of technical development expenses in government loan from 30% to 40%, and laid an emphasis on supporting the development of a series of new technologies. (5) In order to promote the enterprise quality development, Japan has set up various incentive measures, such as the "export enterprise product identification system" in Japanese Ministry of International Trade and Industry and S&T alliance state quality prize—"Deming Prize" to encourage enterprises to improve the product quality and enhance the international competitiveness.

Table 1 Institutions and policies to support SMEs

Name	Content
Special agency	National Life Finance Corporation (1949), SME Finance Corporation (1953), and Credit Guarantee Association (1953)
Specific policies	Equipment Modernization Fund Loan System (1954), Small and Medium Enterprise Funding and other Assistance Promotion Law (1956), Small and Medium Enterprise Modernization Promotion Law (1963), Small and Medium Enterprise Basic Law, SME Guidance Law, Small and Medium Enterprise Modernization Promotion Law, Small and Medium Enterprise Investment Breeding Stock Enterprise Law (1963)

Data source: Zhang Xiumin, Gao Shujuan, *Three Levels of Japanese Quality Management*

In terms of the punitive regulation, it has been mentioned that there are many strict Japanese regulatory laws. Except strict state laws regulation, Ministry of Economy, Trade and Industry is also restricted by relevant industrial policies. Without exception, all policies emphasize that enterprises must run in accordance with regulations, be prohibited from speculating and violating laws and disciplines. In case of violations of laws and regulations, minor ones will lose the credit support of the national government, and serious ones will be fined with such costly penalties that will make an enterprise and person bankrupt and even be thrown into prison. Through the simultaneous application of supportive regulation and punitive regulation, the Japanese government will truly apply the policy of “rewarding the good and fining the bad” to maintain the authority of product quality laws and regulations and promote the improvement and development of the quality management.

IV. Corporate System and Japanese Meso-Level Quality Management

In the entire macro-quality management system, the most important function of the government quality supervision is to guarantee the safety of the overall quality in one country or region. Of course, the government has the task to make the overall social quality develop and achieve a higher objective, but for the sake of higher quality standard, in fact there is no way to determine it statically. What is more important, “the better quality doesn’t result from the direct government behavior, but depends on a sound and fair quality institutional environment and enterprises’ endeavors” (Cheng Hong, 2009) Therefore, the key to march from “quality safety” to “quality development” and seek for a higher and better quality standard is that as the main market player enterprises should be self-controlled, self-standardized and self-managed according to laws, and implement self-management and self-decision in accordance with market laws.

Japanese economy is characterized by linearization, but the market economy is also developed. Thus, in order to deal with the pressure of market free competition, all Japanese enterprises have raised a slogan of “seek existence through quality”, actively manage reform and institutional innovation, and have developed a series of universal and characteristic institutional achievements, which can guarantee the Japanese quality management at the middle enterprise level. To sum up, those institutional achievements mainly include the following four aspects:

(I) Lifetime Employment System

In terms of the employment system, Japanese enterprises generally adopt the lifetime employment system. Even though it seems that such institutional model doesn’t comply with the market logic, but in fact it contains deep economic rationality and meet both parties’ claims of right. From the perspective of enterprises, such employment system can provide stable and superior labor resources, and further push enterprises’ technical innovation and quality development. To cultivate skilled technical personnel not only needs enormous investment but also the medium and long term training. And the lifetime employment system has provided the guarantee for fund and time, and contributed a contractual relationship between enterprises and personnel which is standardized and protected by laws. Therefore, enterprises can rest assured of the long-term management and training of staff, and don’t need to worry about staff job-hopping and resignation, the serious human capital loss and relevant cost. On the other hand, well-trained skilled technical staff will further improve the production technologies and push enterprises’ technical innovation and quality development. From the perspective of employees, it’s advantageous to avoid the risk of unemployment and fully arouse staff’s enthusiasm. This is mainly reflected in two aspects: firstly, it helps the corporate staff be content with their jobs. Japanese labor market is less mobile, so it’s difficult for employers to resign. After resignation from the former enterprise, he can only work in small and medium enterprises where the salary is low, the labor condition is low and the welfare is little, and those people are often ridiculed as “lazy and frivolous”. Thus, the cost for resignation is severe, and it has shaped Japanese staff’s ideological concept of “taking it as it comes” and strengthened employers’ sense of belonging and loyalty to enterprises. In addition, the system can help enhance staff creativity and master sense. Because the prosperous enterprise development is closely related to staff’s material interests, so they are deeply concerned with the enterprise development for their own benefit. If the enterprise develops vigorously, not only the prize will be increased, but also working conditions and welfare facilities will be improved accordingly. Once the enterprise

loses or goes bankrupt, the prize will be decreased, and even he may lose the job. Therefore, for the sake of the enterprise prosperity, Japanese corporate staff is not only devoted to work, but also actively participate in technical innovation and propose rational suggestions, which contribute to the psychological concept of "loving what you do". In a word, due to the lifetime employment system, a contractual relationship is formed between the enterprise and corporate staff, which provides that both parties' obligations guarantee both parties' rights and make both parties feel safe, and is beneficial to the mutual cooperation and the creation of harmonious organization management atmosphere, and indirectly promote the quality management.

(II) Seniority-Based Wage System

In terms of the remuneration system, Japanese enterprises apply the seniority-based wage system which is mainly manifested as the seniority-based wage system and seniority-based promotion system. According to such wage system, the salary isn't determined according to the demand-supply relationship of labor forces, but based on staff's skill of labor and contributions to the enterprise. At the meantime, according to provisions of regular pay rise and wage rise standard, each year corporate staff' salary will be increased. Basic wage increases, the decisive factor is mainly seniority. Under the premise of the seniority-based wage system, young people get little wages, and fail to match his contributions to some degree. In contrary, middle aged and aged employers get more salary. Therefore, in terms of young employers, too little payment means enterprises' investment in disguised form, and the "investment" when he's young will be recovered in the "distribution" when he's old. Employers' dominant investment bears more risks than shareholders' stocks, because if the employer resigns on half way and the enterprise goes bankrupt, he'll suffer direct loss in revenue, so Japanese enterprise employers have to share weal and woe with enterprises in a long term. In addition, Japanese enterprises also satisfy employers' desire of raising social status by the seniority-based promotion system. In other words, in terms of the corporate staff, the material remuneration and corporate position positively related to the seniority, namely, longer seniority, higher remuneration and position. On one hand, it gives corporate staff the hope for the future; on the other hand, it can avoid the intrigue inside the enterprise and among corporate staff, and is beneficial to the creation of harmonious staff relationship and enterprise atmosphere. Under such harmonious today and expected future, the quality is bound to get promoted.

(III) Worker Centralism

The formation of the concept and institution of Japanese enterprises' "worker centralism" originates from the history and institution. In terms of historic reasons, after World War II the Japanese government breaks down the right through three great democratic reforms of financial magnate dissolution, farmland reform and labor legislation to overthrow existing rights and distribute existing assets to bridge the economic and social gap between professional operators and corporate staff and fundamentally reform Japanese enterprises' ownership concept; in terms of institutional reasons, the lifetime employment system and seniority-based remuneration system adopted by Japanese enterprises have intensified staff' sense of master, and throw corporate staff into enterprises to make contributions to enterprises.

Specifically speaking, such "worker centralism" is mainly reflected in three aspects of ownership concept, actual operation and final benefits. (1) In terms of the ownership concept, although employers aren't enterprise owners, but have the sense of ownership. Though the shareholder is the owner, but does not have all consciousness. In 1990, Nikkei Inc. sampled surveyed 100 enterprise section managers on "who should enterprises belong to?" And "Whose is it in reality?" Survey results (see Table 2) indicated that no matter in subjective concept or objective concept, replies of "belonging to staff" accounted for 80% and 77% and topped the list. It further indicated that Japanese enterprises' ownership concept is a concept system centered on the corporate staff and involving other stakeholders. (2) With respect to the actual operation, the relationship of Japanese enterprise operators and corporate staff is different from that in Europe and USA. When the corporate staff comes to enterprises at first, they don't strongly feel employed, and with the age growth, many people can gradually participate in the operation management level and act as the staff representative. Survey results of 113 large enterprise presidents in 1990 indicated: as the support basis for president, the main body needing emphasis was staff (63%), followed by directors (18%) and lastly shareholders (12%), so substantially the Japanese enterprise has become staff's property. (3) With respect to the final benefiter, although the corporate income firstly needs to meet investors' interests, remaining balance is used to ensure the future enterprise development and staff's future interest, thus the corporate staff is the final controller and residual claimant.

Table 2 Survey results of Corporate owners in 1990 (%)

Who should enterprises belong to?	Whose is it in reality?	
Belongs to shareholders	67	59
Belong to operators	19	65

Continued Table 2

Who should enterprises belong to?	Whose is it in reality?	
Belongs to staff	80	77
Belongs to society	70	23
Belongs to customers	27	26
Belongs to the local	10	3

Data source: Itami Noriyuki, *Japanese enterprise architectures*.

(IV) Comprehensive Quality Management

Just as the President of Japanese Union of Scientists and Engineers says that “our country has nothing but the comprehensive quality management, so we must be committed to its in-depth promotion and development, or our arms in international battle will be lost.” In terms of the comprehensive quality management, Japanese scholar Noriaki Kano once explained: “it’s the operation management centered on quality assurance”. Under the leadership of operators, all departments and stratum s must implement the objective management on the basis of daily management (all department management) and all functional management. (1984). In summary, it’s complete participation, complete management, and complete education. After years’ accumulation and practices, the present comprehensive quality management has two new trends: (1) development towards the direction of width and popularization. It’s manifested that all social industries implement the comprehensive quality management; promote the sale services to the product utilization, and consider the extended “warranty period” even the “social insurance”; emphasize the inter-enterprise organization quality management because spare parts purchased by Japanese enterprise from outside account for half of the manufacturing cost, and it’s of vital importance to the sincere quality assurance between enterprises. (2) Develop towards the direction of depth and improvement. It is reflected as follows: emphasize and strengthen the management at the early stage of product formation, and put the emphasis of quality management on stages such as design scheme, processing samples and adjusting technological process, and maintain a strict standard; pay attention to the production continuity and stability, and abandon formalism, nervous production and overload operation; enhance corporate staff’ quality and implement the universal quality management education; regard the people as the core of the comprehensive quality management, and emphasize the “injection of quality awareness into each personnel’s mind”. The promotion of Japanese enterprises’ comprehensive quality management has brought high-quality miracle effect to Japan.

V. Conclusions

In a word, the success of Japanese quality management is the result of the combination of cultural traditional and institutional innovation. After above discussion, two conclusions and enlightenments can be obtained: (1) the good quality originates from two aspects of culture and institution. Firstly, it’s culture, the cultural tradition, the value concept resulted from culture, the world concept and life attitude produced by the culture will influence people’s quality awareness, and the clear quality awareness is based on concepts of loyalty, obedience, cooperation, perfection and diligence; on the other hand, it originates from the institution, which refers to the formally established institution instead of habits and practices. Sound institution will produce not only an external control force to the people, but also an incentive mechanism to the people. Thus, it’s obvious that the success of Japanese quality management is indispensable from the government regulation and enterprise policies. (2) Excellent quality stems from the role of overall functional level. The success of Japanese quality is the result of the mutual interaction and long-term persistence of macro-government regulation, middle government system and deep culture tradition and from the perspective of structure functionalism above three aspects cannot be separated, and the loss of any aspect will influence the role of other levels. The orderly existence and interaction of the three levels jointly push the development and progress of the Japanese quality management. Stones from other hills may serve to polish jade. Above two conclusions and enlightenments are worth learning by China during the transformation period when product and service quality issues are prominent.

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Cultural Traditions, Institutional Innovation and Japan's "Quality Miracle"

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Abstract: Based on the structural functionalism, this essay argues that Japan's "Quality Miracle" dues to the cultural traditions and the institutional innovation. Specifically, it includes the following three points: Firstly, Japan's "quality miracle" results from the Japanese nation's life

attitudes and values which have been shaped by the Japanese special cultural traditions; Secondly, Japan's "quality miracle" results from the Japanese governmental graduations, such as supporting graduation and punishing graduation etc; Thirdly, Japan's "quality miracle" results from the scientific management systems of the various social organizations, such as the lifetime employment system, wage system based on seniority, employee centrism, and total quality management system etc. The interaction of cultural traditions, governmental graduations and scientific management systems has promoted the development and advancement of quality management in Japan.

Key Words: Japan; Quality Management; Cultural Tradition; Institutional Innovation

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Study on the Comparison and Path Selection of International Experience in Food Safety Supervision¹

—— A Review of the Latest Literature

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Abstract: Recently, food safety supervision has become one focus of attention and hotspot. According to reviews of research achievements on the international experience in food safety supervision, existing literatures mainly focus on the supervisory model, institution characteristics, mechanism design and specific punishment mechanism. Most scholars have pointed that many disadvantages and emissions exist in China's food safety supervisory system, so institutional reform and system innovation are needed compared with developed countries. To perfect China's food safety supervisory system must strengthen the legislation, complete the legal system guarantee for food safety supervision, and apply the "vertical supervision" and "concentrated supervision". Specially speaking, we need to actively explore and innovate the supervision concept, supervisory system and supervision mechanism, strengthen the food safety supervision in supply chain links, establish the third-party testing system, especially strengthen the intensity of punishment on illegal enterprises, reinforce local government's supervisory responsibility and build a supervision mechanism balancing interests of the government, enterprise and consumers.

Keywords: Food Safety; Comparison of International Experience; Supervision Mechanism; Supply Chain

Food safety is a public security issue widely concerned in world, because the food quality and security is directly related to human health, social stability and economic development. As a vital global issue, the food safety hazard and foodborne disease have been followed by the society (Zhou Jiehong, Ye Juntao, 2007). Therefore, all governments adopt the technical and legal means to enhance the management level of the food safety, and effectively regulate factors influencing the food quality and safety. At present, complete food quality and safety supervisory system has been established in developed countries and regions such as USA, Canada, EU and Japan to guarantee the food quality and safety and alleviate the credit crisis of confidence of consumers in the government. What is in sharp contrast is that China's food safety supervisory system and system design still have many drawbacks, and is not capable of preventing and regulating food safety. In consideration of the above, the active exploration of food safety supervisory model and supervisory experience of advanced countries, the reasonable absorption and learning in combination with national situations cannot only help effectively avoid mistakes of developed countries, but also help complete China's supervision mechanism, strengthen the effect of food safety supervision, and guarantee the consumption safety.

I. Food Safety Supervisory System in China

Food is the paramount necessity of the people, food safety comes first. In recent years, frequent food safety accidents in China have made people more concerned about the food safety and raise higher demand for food quality. Continuous food safety accidents have posed various challenges to the economic orders of food industry, and have brought various traumas to food industry chain, so the food safety issue has become the topic focus of the whole society. Against such background, scholars have carried out wide discussion centered on the supervisory system of the food safety.

(I) China's Food Safety Supervisory Model

China's food safety supervision belongs to the typically sectional supervisory model, namely, supervisory functions of the food safety belong to different departments. Wang Yaozhong (2005) summarized the organizational structure of China's food safety supervision, and found Chinese

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departments responsible for the food safety supervision such as Ministry of Agriculture, Ministry of Health, State Food and Drug Administration, State Administration for Industry & Commerce of the People's Republic of China, Ministry of Commerce, General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. It shows that so far as China's food safety supervision each department acts on its own and scatter all over. Under such organization structure, China's food safety supervision complies with the market concept of limited access and the regulator regard the "certificate issuance" as the primary regulatory tool (Cui Huanjin, Li Zhongdong, 2013). In addition, State Environmental Protection Administration and National Development and Reform Commission also undertake some supervisory functions. Xie Wei (2010) argued the specific setup of the food safety supervisory institutions from the local to central level: at the level of the central government, the supreme coordinating body of "National Food Safety Commission" has been established; at the level of the local government, the people's government above the county level takes the charge of, leads, organizes and coordinates the food safety supervisory management within this administrative region. In accordance with the principle of consistent rights and obligations, the food safety supervisory responsibility system and responsibility investigation system are established. Targeted at such supervisory model, some scholars have explained it in theory. Some hold that from the perspective of dynamic social contractual theory, China's food safety supervisory system is based on the supervisory though of government-citizen, namely, the duality (Li Changjian, Zhang Feng, 2006); some hold that from the perspective of the supply chain, the rationality of sectional food supervision is explained and propose to establish the agricultural input, food primary agricultural products, food additive, relevant food products, food processing and food circulating supervisory system to complete existing supervisory model in coordination with the corresponding supervisory standards (Lu Jian et al., 2010). The above situation underwent some changes after the "super-ministry system" reform in March, 2013, and food safety supervisory departments have preliminarily realized the centralized supervision of food safety through the function adjustment and authority adjustment. Although this institution reform has implemented the local adjustment within the original framework, it means that China's food safety supervision has started the new institutional reform, and the future reform will be aimed at achieving the centralized supervision and clarifying the rights and obligations of all supervisory departments, and gradually reducing the coordination cost.

(II) Defects and Improvement of the Supervisory System in China

The frequent outbreak of food safety accidents in China has reflected the serious defects of existing supervisory system. These defects are mainly reflected in the following three aspects: firstly, relevant laws and regulations are not complete, and the ability to deal with new food safety problems needs to improve; secondly, the setup of supervisory institutions are not reasonable, and the supervision repetition and supervisory blind area coexist (Jiao Mingjiang, 2013); thirdly, there is a lack of risk assessment and predicting institutions, and the food supervisory standards are in disorder. (Li Lupingping, Wangyang, 2009). For example, Wang Yaozhong (2005) has held that China's disorderly food safety standard system is reflected in two aspects: on one hand, the food safety standard is classified into food quality standard and food hygiene standard, in the charge of Quality And Technical Supervision Bureau, Ministry of Health, and Ministry of Agriculture respectively; on the other hand, the food standard is classified into national standard, industrial standard, local standard and enterprise standard, so conflicts and inconsistency exist among those standards. At the same time, specific supervisory matters are in the charge of the Quality and Technical Supervision Bureau, Ministry of Health, Ministry of Agriculture, Entry-exit Inspection and Quarantine Bureau and General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. As a consequence, all supervisory institutions act on its own, and have no standard authority and uniformity.

Targeted at above problems, scholars have proposed different solutions. For example, Cui Zhuolan and Song Huiyu (2010) has pointed that the traditional single supervisory model based on force cannot satisfy the social demand for food safety supervision, and seriously impeded the effectiveness of food safety supervision. Against the background of service-type administration, it's extremely necessary to apply the diversified non-compulsory supervisory model participated by multiple subjects, integrating more professional technologies and incentives. Li Changjian and Zhang Feng (2006) has explained the legislation dilemma of China's food safety from the perspective of economic laws and administrative laws, and holds that the primary reason for China's dilemma of food safety supervision is the legal flaw, disorderly government organization structure, traditional culture, and urban-rural binary economy. In order to eliminate system diseases brought by existing supervisory models, Liu Yaping (2011) has started from practices of China's food safety supervision and has proposed three suggestions of restructuring the government and market relation, applying risk supervision and guiding social supervision to break out the existing supervisory dilemma. Zhan Chengyu (2007) has analyzed five contradictories in the food safety supervisory system against the background of China's economic transformation, namely, the contradiction of the chain supply of the food safety and food safety supervisory departments' individual actions, the contradiction of backward food test equipment and technologies, and severe food safety hazards, the contradiction of small and scattered food manufacturers and standard management demand of the food safety supervision, the contradiction of food safety hazards and poor law enforcement of the food safety, and the contradiction of social eager for food safety and the short investment in food safety supervision. Therefore, it should be comprehensively managed from near-term governance

objective and long-term governance objective. Therein, the former should emphasize organizing the supervisory system and organizational structure, and completing legal standards; and the latter should emphasize the shift government supervisory functions and the perfection of administrative value structure. In addition, some scholars have proposed some ideas in easing information asymmetry, strengthening information platform construction (Shi Cheng, Zhou Deyi, Wang Puqing, 2008), implementing quality assurance system and traceability system (Wang Zhigang, 2006; Zhou Jiehong, Yejuntao, 2007; Zheng Fengtian, 2003; Zhou Yingheng et al., 2013).

II. Food Safety Supervisory Model and Characteristics of Major Developed Countries

Developed countries such as USA, EU and Japan have established the relatively complete food safety supervisory system, and after years' development it has formed the relatively unique supervisory model and supervisory experience. According to the summary of different supervisory models, some experience and reference can be provided for the design of China's food safety supervision mechanism, and some scholars have actively discussed the above issue. For example, Zhang Yueyi, Han Zhijun and Ji Ren (2007) starts from the supervisory institutions, laws and regulations and risk management to elaborately discuss the food safety supervision mechanism in US, EU and Japan. Li Gang (2010) has analyzed the overseas food safety supervisory system in combination with China's national situations, and proposed to draw on American experience in implementing the combined supervisory system of the food safety and to establish the food safety supervisory network characterized by the mutual independent and cooperative supervision of central government and local government. State Administration for Industry & Commerce, Ministry of Commerce Research Center (2006) proposed to learn from British and Spanish beneficial experience in food safety emergency mechanism after the investigation of both countries' supervisory systems. Wang Zhaohua and Lei Jia (2004) have put forward the adoption of the progressive and staged modes and promote the standard certification system of China's food industry through studies on food safety supervisory models of major developed countries. Due to the difference between different countries in the economic system and political system, it's necessary to organize different countries' supervisory system.

(I) American Supervisory Model-Complete Laws, Centralized Rights and Obligations

As the representative of multiple departments' supervisory models, US federal government and all state government have established 20 agencies in food safety management. But there are only five administrative departments with the complete law enforcement rights in food safety: Food and Drug Administration under the US Department of Health and Human Services, the food safety and Inspection Service and Animal and Plant Health Inspection Service under US Department of Agriculture, US Environmental Protection Agency, US Customs and Border Protection. Above supervisory departments are divided according to food types, in this way the centralized functional supervision of specific food can be realized during the supervision (Zhang Yueyi, 2007) and the unification of rights and obligations. One prominent characteristic of US in guaranteeing the food safety is that it owns the powerful supervisory system, complete laws and regulations, and special practices in special fields, and emphasizes the openness and transparency in food safety management (Mao Zhenbin, 2009). In addition, the *Food Safety Modernization Act* implemented in January, 2011 in USA has become the important legal foundation for safeguarding the food safety, and this act has intensified efforts in food enterprise inspection and law enforcement and raised the food safety standard, built a more active and strategic modern food safety "multi-dimensional" protection system through emphasizing the food safety control concept dominated by the prevention, and has guarantee that US stands in the forefront of food supply safety (Li Tengfei, Wang Zhigang, 2012).

In various system designs, the food safety recalling system in US is noteworthy (Antle, 2000; Cheng Yanqing, Huang Zuhui, 2003). Generally speaking, the food recalling is voluntarily implemented by manufacturers under the supervision of state departments, and is seldom forced by the court (Buzhy, 2001). As the food recalling system becomes popular, American consumers are quite confident with the food safety. Generally speaking, the USA food recalling mainly occurs in the following two situations: firstly, enterprises is informed of the food defects or risks, and actively withdraw products from the market; the other is that FDA (Food and Drug Administration) forces the government to recall defective food (Chen Weikang, Luo Le, 2009). No matter under which situations, the recalling is implemented under the supervision of FDA, and plays a crucial role in food recalling (Valeeva et al., 2000). With the implementation of this system, the food recalling tends to rise up, but it doesn't indicate that the food quality is decreasing. Instead, it shows that people have raised higher demand for the food safety (Christophe and Valceschini, 2008).

(II) EU Supervisory Model-Comprehensive, Specific, Unified and Authoritative Standard System

The complete specific standard system is one outstanding feature of food safety supervision in developed countries, and EU countries have realized the effective prevention of food safety hazards, and have implemented a large quantity of specific and unified food technical standard system. EU food safety supervisory system is mainly composed of EU Food Safety Agency, EU Food And Veterinarian Office, and this is an international control and supervisory system and can apply the supervisory control over all links in the food production chain of all member states (Charlier, 2008)

Moreover, a series of compulsory food safety standards are formulated (Jiao Zhilun, Chen Zhijuan, 2010). For example, as early as in 1980, EU implemented *EU Food Safety and Health System*. In 2000, it promulgated *Food Safety White Paper* and demanded to formulate the food safety legal system based on the control of overall process “from farmland to dining table”, and further systemize various laws, regulations and standards (Zhang Zhikuan, 2005). In recent years, as the food risk uncertainty increases, EU regard the food safety prewarning as an important principle and risk management measure to control food safety (Grunert, 2005). In accordance with this measure, as long as the supervisory department thinks that the food has potential hazards for the human health, it can take protection measures on the basis of prewarning principle, instead of obtaining evaluation conclusions with adequate science data, in which way the probability of food risk occurrence will be greatly decreased.

Among all EU members, British and Germany control value of food safety is worth noticing. One important feature of the British food safety supervision is the strict implementation of food traceability and recalling system. Major management institutions which Britain guarantees the food safety is the Food Standard Agency, is mainly responsible for overall affairs of food safety quality and formulating various standards (Liu Guirong, et al., 2010) On behalf of Queen, Food Standard Agency performs the function and report to conferences. Such institutional setup method without depending on any government department has guaranteed its independence and stands for consumers’ viewpoint. In addition, the Food Standards Agency establishes the special working group led by the chief executive officer to strengthen the supervision in all links in food supply chain. The success of British food safety supervision is closely related to three principles formulated by Food Standards Agency, namely, the putting the consumer first, open transparency and just independence (Zhang Shouwen, 2008). What is different from Britain is that the feature of Germany food safety control is its sound testing system (Luo Dan, 2010). Most of Germany testing organizations are private and the government is only responsible for the management and approval of supervisory institutions, but testing organizations will independently conduct the quality inspection through monitoring stations and submit the testing report (Dong Juan, 2011). For a long time, the food safety supervision, and food enterprise self-inspection and report system implemented by the Germany government have become the decisive mechanism of German protecting consumers’ health. Germany food supervision is in the charge of all states, and state government relevant governments formulate supervisory schemes which are implemented by all municipal and county-level food supervision officers and veterinarian officers.

(III) Canadian Supervisory Model—Whole-Process Monitoring of the Supply Chain

The characteristic of the Canadian food safety supervisory model is that the single department applies the unified management of the food safety, and this department is the Food Inspection Bureau under the Ministry of Agriculture. Ministry of Agriculture is responsible for the food safety supervision, and implement all food supervision, testing, plant protection and animal healthy quarantine plans specified by the federal government, the daily supervision, spot inspection and case investigation of food production, processing and sales, food safety laws and food safety standards, and supervising the implementation of relevant laws and standards (Li Gang, 2010) to ensure the food safety in links of the supply chain. Except perform above functions, the Inspection and Quarantine Bureau is also responsible for formulating and managing food inspection, law enforcement, supervision and control plans, and proposing the service specification; or issuing the emergency food recalling command, organizing the inspection, testing and supervision of the entire food chain (Zhou Jiehong, Ye Juntao, 2007) In addition, Canadian Food Inspection Bureau is responsible for the supervision, place of origin inspection, animal, plant, food and package quarantine, drug supervision, processing facility inspection and label inspection of agriculture inputs to really realize the whole-process management “from farmland to dining table”. Canadian supervisory model has realized the centralized supervision and avoids many problems such as confusion about duties and blank supervisory space due to many responsible persons.

(IV) Japanese supervisory model-strict and complete standard system and traceability system

Japanese food safety supervisory model is quite similar with that in China and the supervisory duties is implemented by multiple departments. In recent years, a great change in Japanese supervisory system is that the food safety committee was established in 2003 and it’s responsible for the management and risk evaluation of food safety affairs. Food safety committee is the internal affiliated institution responsible for food safety risk evaluation and coordinating function, and its major functions include the food safety risk evaluation, the policy guidance of risk management departments, and the communication and publication of risk information. The most prominent feature of the Japanese supervisory model is the complete food safety standard system and traceability system (Sun Hangsheng, 2006), and its food safety standard system is divided into state standard, industrial standard and enterprise standard (Yang Mingliang, et al. 2004). The *Food Safety Basic Law* implemented by Japan has erected the food safety concept of the customer first, scientific risk evaluation and the whole-process supervision from the farmland to the dining table, and demands to ensure the food safety in each link of domestic and imported food. In the new century, Japan has modified this law for many times, for example, it added the “affirmative list system” to the law in 2003, which caused the stricter constraints on imported food (Shi Yonghai, 2010)

At the meantime, Japan applies the rigorous traceability management system to all agriculture products and is realized by complete legal systems

(Hu Dinghuan, 2007). In accordance with this management requirement, local farms affiliated to the Japanese agriculture association must record the producer, farmland site, applied pesticide and fertilizer, application times, harvest and sale date of rice, garden fruit, meat product and dairy product. After the agriculture association collects above information, it will assign an “identity” number to each agricultural product, organize them into database and establish the network for consumers’ search. At present, most of food enterprises in Japan are self-disciplined in food production and processing, and basically all food production and processing links have really realized the whole-process and traceability management from the farmland to the dining table (Wang Yaozhong, 2005).

(V) Korean food safety supervision-diversified management and emphasis on the disorder control

Compared with other Asian countries, Korea spares great efforts in food safety management and its main features are the diversified management of the food safety measures, strengthened enterprises’ responsibility for being the main body, and intensified punishment efforts in illegal enterprises. Specifically, Korea mainly guarantees the safe food supply from the following four aspects: Firstly, strengthen the internal coordination of the government, and reduce wrangled administrative management. The Korean government has established the state food safety policy committee to be responsible for coordinating the work between different supervisory departments and avoid the confusion about duties and buck-passing (Wang Zhongliang, 2007). Secondly, intensify the punishment on illegal enterprises, and deter illegal enterprises from committing crime. Korean government has classified the behavior of manufacturing and selling hazardous food as “health crime” and provides in *Food Safety Law* that personnel deliberately manufacturing and selling inferior food are sentenced with above one year’s fixed-term imprisonment; related persons responsible with serious impact on national health are sentenced with above three years’ fixed-term imprisonment. Thirdly, implement a clear responsibility registration system. Korean government decides that the health supervisory personnel should clearly record his own name after completing the inspection and acceptance and he should be responsible for problems of his accepted food. In addition, the local government department responsible for food safety will give the quantitative score of a series of safety indexes such as the pesticide residual quantity according to unified standard, so as to eliminate inconsistent food safety standards (Huang Yi, Wang Tingli, 2010). Fourthly, set up telephone hotline, and mobilize the masses to carry out supervision. Korean policies provide that any person can report food safety problem to the government, and once verification, the reporter can win ample reward.

After the summary of above countries’ food safety supervisory models, we can conclude three enlightenments. Firstly, we should learn from foreign food safety management system and establish the unified and effective food safety management institution as soon as possible. And we should further adjust the food safety supervisory system, organize and clarify each department’s supervisory functions (Dai Xiaoti, Chen Hongying, 2010). Under the trend of centralized supervision of food safety, we should further reduce the number of supervisory departments and consolidate supervisory functions. In accordance with the food chain from “farmland to dining table”, we should rebuild the food safety management flows, organize the relatively independent food safety institutions, implement project system and whole-process management mode, and guarantee the controllability of product quality and the responsibility traceability (Kahneman and Tversky, 1979; Knetsch and Sinden, 1984; Hobbs, 2004). Secondly, all food safety supervisory departments must perform their own functions, vigorously cooperate with each other, work in accordance with laws, and jointly wave a closer food safety supervisory network. Only through imposing heavy pressure on food problems, further implementing supervisory measures, enhancing the supervisory pertinence and effectiveness, can the effective supervision and whole-process supervision of the food safety be really achieved (Broughton and Walker, 2010). Thirdly, strengthen the main responsibility of enterprises and punishment. The government should change the thought and pattern of enterprise supervision, and convert the substituted and nanny management into supervising and promoting enterprises to voluntarily perform production and operation obligations (Henson et al., 2000) and make enterprises actively shoulder the social responsibility. Therein, administrative and criminal punishment to illegal enterprise should be strengthened, and the inertial thinking of protecting all enterprises should be adjusted to the right thinking of protecting legal enterprises; illegal enterprises must be strictly cracked down to strengthen the legal authority and increase the cost for illegal behaviors.

III. China’s Food Safety Supervision Mechanism Perfect Path Selection

Developed countries have accumulated numerous effective experiences in food safety supervision, and such experience provides useful reference for completing China’s food safety supervisory system. However, existing studies are relatively fragmented and unsystematic, so it’s difficult to master the food safety supervision mechanism in overall. On the basis of summarizing and organizing existing studies, it’s proposed to conduct active exploration and brave innovation from three points and further complete our food supervision mechanism.

(I) Concept Innovation - Risk Communication and Risk Management

Risk communication is an important chain in food safety management, and its function is make the public learn how the risk management avoid the

public panic, and developed countries have adopted this practice to effectively control the food safety risks and have successfully eliminated the crisis of confidence with the food safety. Covello (1992) thinks that the risk communication is the exchange of relevant information between stakeholders on the risk essence, importance or control. In terms of the risk communication scope, Seeger (2001) thinks that it should cover three stages, namely, the pre-crisis, crisis and post-crisis period, but he emphasized that the attention should be paid to the pre-crisis prevention work. The adoption of risk communication can promote the sound communication between the government and the public, develop the participatory supervisory governance pattern, and form the effective risk-defined social supervision (Mao Wenjuan, 2013). Now China is under the crucial stage of economic transformation and social transformation, the effective risk management of the food safety—a part of the public crisis, is of crucial importance to government prompt action and crisis dissolution (Wen Zhiqiang, 2009).

At present there are four risk communication modes: the first is the confidence-building mode. The confidence is the basis for all communications and any communication will either weaken the confidence, or reinforce it. The second is two-way symmetrical communication model. The risk communication is a special communication process. Although scholars have been emphasizing that this process should be an interactive process, in fact for most of risk accidents, especially the public risk accidents, the main-body position of both communication parties is difficult to be equal. The third is anger management and early-warning mode. Such method is of vital importance to clarify the public demand, define short-term communication objectives, guide and create key communication information. The fourth is information-highlighting mode. This mode can adopt such methods as the active information distribution, organizing the journalist interview, organizing expert relies and organizing mainstream media training. Although above four modes have their own advantages, after the summary of several food safety accidents in China, the “democratic” government risk communication is widely accepted. Because the risk communication is diversified, democratic and participatory (Valeeva et al., 2000), so we should not only impose rules on the people and inform them of risks, but also should implement the people-oriented administration. In the treatment of food safety accidents, special attention should be paid to the people’s proposals and the respect of the public right to know. However, the public should also convert from “the passive public” to “the active public”, actively seek for health information, actively provide risk information, and realize mutual assistance and exchanges.

(II) Mechanism Innovation - to Strengthen Food Safety Supply Chain Management

The food quality safety involves the food production, processing, storage and sales. Due to complex trading subjects and parties in the entire food supply chain, any participant’s behavior may influence the product quality and safety (Hong Jiangtao, Huang Pei, 2011; Wang Haiping, 2009). With the increase of the consumers’ income and the popularization of food safety knowledge, food production enterprises’ management of food supply chain is in urgent need of reinforcement so as to guarantee the smooth upstream raw material supply and downstream sales channel (He Pinghua, Ling Yuanhua, Zhou Deyi, 2009). The core idea of the supply chain management mechanism is the wide introduction and application of various social resources and powers, the conversion from the “end treatment” to the “source control”, and the comprehensive management of the entire food supply chain from the farmland to the dining table. Therefore, domestic and overseas scholars propose to adopt the supply chain management to enhance the supervisory efficiency of the food safety. For example, Hennessy et al. (2001) has analyzed the relation problem of food quality and governance structure in food supply chain and emphasize the application of supply chain to improve the supervisory management level of the food safety. Vetter and Karantiniis (2002), et al. have argued that the leadership power and supply chain in the safe food supply have active advantages in guaranteeing food safety.

The occurrence of “clenbuterol” and “instant chicken” have reflected that the agricultural product supply chain has serious food safety hazard, farmers’ strong eager for short-term profits, and the difficult control of food safety due to the interest conflict and information asymmetry between upstream and downstream supply chains. Therefore, the implementation of supply chain management and behavior constraints on interest bodies in supply chain have become a crucial mechanism innovation in controlling food safety. The core of supply chain management is the formation of the just and reasonable interest distribution mechanism (Wei Biqin, 2011; Li Ning, 2011), namely, the rational distribution of the subject interests of farmers, cooperatives or supermarkets and processors in supply chain. In addition, it helps to eliminate the uncertainty of the supply chain demand, supply and the manufacturer, and avoid the food safety and quality risks. (Huang Guihong, Rao Zhiwei, 2011). Taking the live pig industrial chain for example, to develop the sound cooperation between farmers and butcher, processing and selling enterprises, the cooperation, coordination, incentives and supervision, negotiation and confidence mechanisms must be built between interest subjects of the supply chain (Li Yanfen, 2011). At the meantime, in order to avoid the opportunist behaviors of supply chain main bodies due to information asymmetry, appropriate defective products penalty and member shares of external losses should be defined, in which way it can encourage manufacturers and suppliers to strictly perform contracts, guarantee the product quality control level, and further realize the maximum profits of subjects in the supply chain (Lu Lili, Zheng Hongling, 2011).

(III) Institution Innovation - to Establish Third-Party Testing System

One of domestic food safety regulating bottlenecks is the inadequate supervisory force, and an important method to resolve the problem is the establishment of the third-party testing system. With a reference to mature international experience, the independent third-party testing can not only compensate the shortage of government testing power, but also help to improve the efficiency of quality detection; therefore it's an institution choice worth learning during the reform process of China's food safety supervision system. The so-called third-party testing refers to an institutional arrangement that the relevant institution appointed by the state as an independent third party, which certifies and tests all food production links from raw materials to finished products to ensure the product quality (Zhou Qingjie, Xu Feifei, 2010). In recent years, European and American advanced countries explore to establish the third-party inspection and testing during the food quality supervision "from farmland to dining table", which has become an obvious trend (Gao Qinwei, 2011; Xue Qinggen, 2006). For example, American food is certified as the safest and American supervisory personnel adopts the third-party detection quite early, which hands over the routine tests to the certified certification body or independent testing center or laboratory in all states; meanwhile, the government just takes responsibility to supervise if the third party complies with provisions.

The "poisonous capsule" in 2012 has shown the serious shortage of food and drug supervision, so it's urgent for us to establish the third-party testing system. According to statistics, there are about 80 thousand food and drug supervisory personnel who supervise almost 5000 drug production enterprises, 400 thousand drug communication enterprises, 170000 medical apparatus enterprises, over 3400 cosmetic enterprises, over 2000 health food production enterprises and 2.3 million catering enterprises. The huge enterprise number is in sharp contrast with limited supervisory personnel, so it's urgent for us to deal with the challenge of inadequate supervisory power. The reinforcement of public participation in food safety supervision is the objective demand of compensating government failure and inadequate power (Miao Jianping, Xiong Zijie, 2010). Therefore, in order to establish our third-party testing system, we must gain the powerful support from existing social resources, and specially play the public role (Ruan Xingwen, 2009). At present, there are a large batch of state research institutes and institutions of higher education related to the food science and strength-based professional enterprises. Those excellent professional resources will become a feasible choice to effectively compensate the shortage of government resources and enhance the food quality testing efficiency, and provide the reliable technical support and institutional guarantee for citizens' food consumption. In order to guarantee the social credibility of third-party testing institution, those institutions will be strictly supervised by the government, industrial associations and market. The government is the supreme supervisor of the food safety, so to the third-party testing institution, in order to obtain the approval of the society and market of testing results, it must be approved by the government. Only with the government approval of test reports, can the third-party institution obtain the necessary authoritative social guarantee for existence and development.

IV. Conclusions and Prospect

The perfection of food safety supervisory system is not only a theoretical problem but also an actual problem. According to the organization of related domestic and international literatures, three conclusions can be reached. Firstly, scholars have put forward different solution thoughts for the perfection of food safety supervisory system, but in the final analysis, the perfection of the supervision system is regarded as a progressive process and needs multiple measures in institution design, system establishment and social mobilization. In addition, at the theoretical level, existing literatures mostly discuss the reasons for the food safety formation and solution mechanism. For one, represented by the institutional economics theory, current sectional supervisory system is proposed to change from the perspective of institutional innovation and transition; for another, represented by the supply chain theory, it proposes to establish the food safety supervisory system from the perspective of completing the supply chain to guarantee the food safety from the farmland to dining table; thirdly, with a reference to developed countries' experience, namely, "adapt foreign things to Chinese needs", take advantage of developed countries' "stones from other hills" to complete the domestic supervisory system. Lastly, in terms of the actual application and economic theories, lots of literatures start from the information asymmetry to study the economics basis for the market failure and government failure of food safety supervision.

In spite of enormous literatures studying the food safety supervisory system, most of studies are limited to the resolution of domestic realistic problems and few delve into studies completing China's food safety supervision mechanism. Thus, as a whole a systematic theoretical analysis framework hasn't been formed, and there is a lack of in-depth empirical studies. In March, 2013, the State of Council implemented the super-ministry reform, which has adjusted the supervisory function of the food safety, integrated the production link of State Quality Inspection Administration and the supervision of circulation links by State Administration for Industry and Commerce, and reflected the thought of the centralized supervision of the food safety, so this practice draws on beneficial international experience to some degree. However, the specific reform direction and perfect path still need the in-depth studies, for example, how to optimize grassroots supervision, reinforce the "management-penalty linkage", realize the social shared-governance, increase the financial investment in the food safety, and think about including the food safety into the

government performance assessment. All above aspects have become important points and study direction in future discussion. In brief, the food safeties is related to the national economy, people's livelihood and social harmony, in spite of some limitations in the researches carried out by numerous scholars home and abroad from different perspectives. The beneficial exploration of completing the food safety supervisory system is worth confirming, which is of crucial importance to the in-depth studies in future, the further innovation and completion of food safety supervisory system.

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Study on the Comparison and Path Selection of International Experience in Food Safety Supervision: a Review of the Latest Literature

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Abstract: Recent years, food safety regulation is one of the focus and hot spot in academia. Based on the literature of food safety about supervision experience, this paper found that the research mainly focused on the problem of supervision mode, system characteristics, and design and punishment mechanism of food safety. However, there were many drawbacks and loopholes in our supervision system of food safety, many areas are

needed to improvement if compared with developed countries. To improve the food safety supervision system, our country should strengthen the legislation to enhance the legal system of food safety supervision and change the “sub-regulation” for “vertical supervision” or centralized supervision model. Specifically, we need to innovate the food safety supervision mechanism, utilize the supply chain and set up the third party inspection system, especially to increase the penalties for illegal enterprises, strengthen the oversight responsibility of local government and balance of interests between government enterprises and consumers to improve our regulatory system.

Key Words: Food Safety; International Experience; Regulatory Mechanism; Supply Chain

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Analysis on the Reform of Special Equipment Inspection System from Top-Level Design Perspective¹

Liu Sanjiang

Abstract: Special equipment inspection system is a vital part of the special equipment safety supervisory system. Current special equipment inspection system is prominently characterized by planned economy, and basic role of allocated inspection resources in market plays a poor role, and the effective competitive restriction mechanism hasn't been established yet, so it's necessary to deepen the reform. The current special equipment inspection system reform is restricted by multiple factors, and its progress in different regions is unbalanced; in addition, the unified consensus on the reform direction and path hasn't been reached, and it's also impeded by the coordination problem of interests. It starts from the safety development, and is based on theories such as inspection nature, location, function and responsibility, and conducts the analysis from three reform paths of administrative supervision, technical services and product certification. In addition, the reform mode of the legal inspection "one divided into two" is proposed, namely, the separation of enterprise self-inspection from the state mandatory inspection; meanwhile, the reform path design should coordinate and consider key points, strength and pace in reform, and improve the reform scientificity and coordination.

Keywords: Special Equipment; Inspection System; Reform; Top-level Design

I. Problem Description and Literature Overview

(I) Raise of problem

Established in 1955, China's special equipment safety supervisory system has underwent constant reform and developed into the "double-track" and "whole-process" supervisory system, namely, the double-track operation system of administrative supervision institutions, testing inspecting institutions; at the meantime, the whole-process supervision from design, manufacturing, installation, modification, maintenance, application to testing is carried out. Therein, the legal inspection system and the government-dominant inspection system dominated giving full plays to social power are implemented in the inspection link. Legal inspection mainly includes the type test and supervisory test in production link, and the regular inspection in application link. Inspection institutions mainly include the quality inspection public institution, industrial inspection institution, and enterprise self-inspection institution. Enterprises make routine inspection and annual inspection and so on for their own equipments. There are also some market-oriented special testing bodies engaged in special tests such as nondestructive testing.

After over half century's reform and development, China's special test work has obtained leapfrog progress, and has played a vital role in enhancing the special equipment quality and safety, preventing and reducing the occurrence of special equipment safety accidents, promoting the technical progress of special equipment industry, and elevating the scientific supervisory level of the special equipment supervisory department. However, at the present stage, special equipment inspection institutions cannot make qualified market subject providing the special equipment quality and safety signal, and cannot fully rectify the problem of information asymmetry widely existing in special equipment quality and safety fields. And the role of such information asymmetry in distorting market information allocation has been proved in classical literature by Akerlof as early as in 1970. What's more important, the existing special inspection system is characterized with features of the planned economy, and the fundamental role of inspection resources allocated in market isn't made full use of, and there's still no effective competition restriction mechanism; the unclear nature, positioning and responsibilities of different types of inspections and tests, over large legal inspection scope, excessive projects, problems of offside, malposition and omission; we should give a play to enterprises' enactive role, because enterprises' lack of autonomous right is not beneficial to the implementation of enterprises' entity responsibility; too heavy inspection tasks in developed regions, a lack of inspection tasks and unbalanced

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development in underdeveloped areas; as the work amount of local inspection institutions increase greatly, the internal inspection force is obviously deficient, so the man-machine contradiction becomes growingly prominent; the lack of social inspection power and blind area of inspection; the “over-inspection” and “lack of inspection” exist to different degrees, and the inspection quality and effect need to be enhanced; some inspection charging methods are not scientific and charging standards are not reasonable, so charges and work amount don’t match, and the society has assumed too high safety cost; some inspection institutions ignore the inspection risks and responsibilities, and excessively pursue the rapid increase of inspection income, so they have broken away from the non-profit nature of legal inspection.

Special equipment inspection (hereinafter referred to as special inspection) system reform is the key field and crucial link in special equipment safety supervisory system reform, and is related to the scientific development of special equipment safety accidents. Thus, we must be aware of the reform necessity, do well in the top-level reform design, intensify the reform scientificity and harmony, and build a system beneficial to the scientific development of special inspection work. Facing these problems, we must deepen the special inspection system.

(II) Literature Overview

Literatures related to this paper are mainly classified as two types: literature related to the system reform path, and literatures of quality supervisory system reform. Theories about the system reform path and institutional arrangement is generally divided into progressive change and radicalism. The former is represented by the spontaneous order as explained by Hayek in *The Constitution of Liberty*, which proposes that the institution generation and reform is a constantly evolving progress in the progressive and trial-error manner instead of a subjectively built progress. In addition, Hayek points that the so-called social order is divided into spontaneous order and constructed order, and the latter is the organized or human-made order, but he praises the spontaneous order highly. Scholars believing the institutional change propose that the institutional reform path advocates step by step and is driven by the market mechanism self-adjustment, and regard the market subject as the reform subject. Du Wei and Gao Linyuan (2002) emphasize the realistic importance of institutional change during China’s economic development, and the selection of the institutional change should start from the mandatory institutional change to the inductive institutional change. Some scholars insist on the radical system reform and follow the American economist Jeffrey Sachs’ institutional reform concept and policy arrangement, but the reform tried in Russia fails to gain obvious success, thus this mode is lack of the practice support. However, some domestic scholars think that the political and government system reform is the key point for China to further deepen the reform, and wish to resolve multiple issues through the system reform, so it cannot say that the radicalism reform idea has no market.

At present, “top-level design” has become the new consensus in the path selection of China’s system reform, namely, we should consider system reform in all aspects, at all levels and of all elements from the overall perspective, coordinate various relations, determine goals and formulate correct strategies and paths to increase profits, reduce risks and cost. Targeted at the complex system of China system reform, the “top-level design” emphasizes the coordinated application of strategic thinking and systematic thought, and combines advantages of progressive change and radicalism advantages to make it more scientific, reasonable and operable in practices. Zhu Lijia (2011) has pointed that the “top-level design” of the reform should consider the value of reform development and start from the strategic height to guarantee the institutional balance and promote the administrative system reform centered on restraints and supervision. Wu Jinglian (2013) has pointed that the current emphasis in reform work refers to the overall reform planning and key reform scheme design, organize a group of key reform projects of wide coverage, global, complexity and intersection, mutual coexistence, and formed “minimum a basket” of reform schemes to realize the coordinated promotion and key breakthrough of the overall plan.

In terms of the institutional reform of China’s quality supervision, some domestic scholars have carried out impressive studies. Cheng Hong, Li Dandan (2009) regard the market mechanism as the starting point of the path selection of China’s macro-quality management system, but this institutional reform aims to build the institutional arrangement matching the market economy, and the core objective is to guarantee the quality safety; in addition, they have defined the basic nature of macro-quality management system under the condition of market economy, analyzed major problems such as consumer omission and government offside, and has finally proposed that the comprehensive reform of the market, society, and social quality supervisory system is the main path and institutional arrangement of China’s macro-quality system reform. Cheng Hong et al. (2012) has proposed that the design of government quality management system decides the effectiveness of the quality safety risk governance. Through studies on the law of American government quality management system, this paper points that the risk drive, independent supervision and co-governance are core elements of the system, and put forward the basic thought and governance mode of China’s government quality management system reform on the basis of general experience and in combination with China’s current quality situation.

It can be seen from above literatures that scholars have conducted relevant studies on the system reform path design, the path and institutional arrangement of China’s quality management system reform, and provided the theoretical support and reference for the path design of the special

equipment inspection system reform. However, the special equipment safety inspection system, especially the special inspection system, has its own characteristics and differentiated internal laws, so it needs professional studies to find the institutional arrangement and path design of the system reform.

II. Top-Level Design of Special Inspection System Reform: the Discussion Based on General Theories

Outline of the Twelfth Five-Year Plan for National Economic and Social Development emphasizes that “more attention should be paid to the top-level reform design and overall planning”, which is the consensus currently reached in the field of China’s system reform. Similarly, the special inspection system reform should do well in the top-level design of the reform scheme and improve the scientificity of the reform decision-making. Major reform thoughts are as follows: clarify the inspection nature, capture the inspection location, specific inspection responsibility, optimize the resource allocation, scientifically implement inspection, standardize the operation management, coordinate all parties’ interests, promote the scientific development of special test work, and better serve the economic and social safety development.

(I) Analysis of Special Inspection Reform Status

In recent years, the special prosecutor institutional reform continued to deepen. Firstly, it promotes the development of large-scale inspection institutions. After the implementation of the combined reorganization, the total number of special inspection institutes reduces greatly, and in about one third of provinces provincial quality inspection system special inspection institutions are merged into one institution. In this way, small but disperse, small but complete situations are preliminarily improved, and it has promoted the resource integration, effective configuration, and the enhancement of technical and management levels. Secondly, it explores the special prosecutor market-oriented reforms. The gas cylinder inspection and non-destructive inspection are market-oriented, and enterprises independently select inspection institutions in fields such as elevators, complete set of petrochemical units, key engineering pressure piping, and lifting devices in site, which grant enterprises with the autonomous right and give a play to the role of social power. Especially in the elevator inspection and reform, Guangdong province establishes the primary responsibility system of elevator “use right owner”, establish the elevator maintenance system with the manufacturer as the subject, build the elevator accident liability insurance system, and has made local breakthroughs. Those reforms have achieved active effects and accumulated beneficial experience.

However, the special inspection reform outstanding problems still exist. First, the reform remains in the shallow level. The combined reorganization of special inspection institutions are restricted by the authorized size, personnel, finance, and fund management. In addition, it hasn’t been radically implemented in most provinces, and the implemented is only the form integration. Thus, enormous difficulties lie in front of the legal person entity and the special inspection public institutions reform hasn’t achieved substantial progress, which still follow the management system and operation mode established during the planned economy. Second,, a unified understanding of the reform has not been formed yet. As the reform deepens, arguments and divergence on when and how to implement the reform become more serious. Someone thinks that special inspection problems and risks are more prominent, so it’s urgent for us to reform; someone thinks that the current situation can meet the actual demand, especially under the situation that the state public institutions reform and safety supervisory reform aren’t put in place, it’s still not time for the special inspection system reform; someone thinks that we should comply with the demand of market economic system, and promote the special inspection marketization; while others think that the legal inspection belongs to the part or extension of the administrative supervision, so it’s of the administrative nature, the marketization cannot be implemented. Third, reform faces great resistance. The reform involves the interests of supervisory institution, various inspection bodies, enterprises and the society, so the interest adjustment and redistribution are confronted with enormous resistance (deeper reform, larger resistance). Recently, the central department decides to cancel the vertical management system under the quality supervisory department, increases the constraint and uncertainty of the special inspection system reform, so the implemented special inspection institution group-building reform faces the risk of turning back.

Due to the inconsistent ideological understanding of important issues such as the reform necessity, time and direction, especially the difficulty to coordinate all parties’ interests, the special inspection system reform is still confronted with great difficulty, challenges and risks, so it’s urgent to carry out the top-level design in the reform path, and find out the wrong region in the special inspection system reform.

(II) Principles, Paths and Patterns of Special Inspection Reform

1. Adhere to “Three Persists”, and Master the Right Reform Direction

Firstly, persist in guaranteeing safety. The safety is one of the most concerned, most direct and realistic basis interests. The special inspection is an important technical means and support of guaranteeing the special equipment safety, and is the most fundamental mission and duty of guaranteeing people's life and financial safety. The special inspection system reform must firmly seize the primary task of "safety" and provide better safety services.

Secondly, persist in service development. The special inspection work must be closely centered on the economic construction and the overall situation of the sound and rapid economic and social development. The special inspection system reform is fundamentally aimed to constantly improve the special inspection system, enhance the special inspection level, realize the maximum effect of limited inspection resources, and better serve the economic and social safety development.

Thirdly, persist in own comprehensive, coordinated and sustainable development. The special inspection system reform should stick to the basic demand of the overall, harmonious and sustainable development, constantly reform and optimize the institutional environment of China's special inspection work, promote the comprehensive and harmonious development of various special inspection institutions, improve the unification of safety, economy, high quality and low cost, and accelerate the sustainable development of the special inspection work.

2. Analyze "Three Roads" and Select Right Reform Road

Except all parties' inconsistent views of interests, the primary reason for the inconsistent understanding of the special inspection system reform is the fuzzy definition of the nature, location, function and responsibility of the legal inspection, thus they cannot know basic theories and realistic issues such as the legal inspection management system, mechanism and modes, and cannot reach the consensus on reform paths. There are three main ideas on special inspection system:

First, take the road of administrative supervision. The legal inspection is the mandatory inspection implemented by the government to guarantee the demand for public safety, and such inspection is the extension of the administrative safety supervision, so it has the nature of administrative supervision, so it should be mainly implemented by the non-profit inspection institutions established or authorized by the government, instead of marketization.

Second, take the road of market services. The legal inspection is the legal obligation of enterprises, but enterprises have the right to select the way and mode of obligation performance, and the inspection should be marketized. Meanwhile, the inspection technical service should be implemented by inspection institutions selected by enterprises instead of those designated by the government.

Third, take the road of product certification. The legal inspection is a kind of product certification activity, and is a qualification evaluation activity in which qualified inspection institutions will verify if the special equipment complies with relevant technical specifications, standard or compulsory requirements; meanwhile, it should be implemented by the independent and just third-party intermediary organization, in which the administrative monopoly cannot be imposed, and that cannot be completely marketized and but market competition can be limited.

Above three opinions mark sensible, and it seems to be the problem of marketization or not, but substantially the argument of the legal inspection nature. It can be found from theories and practices that the first opinion is reasonable, and the starting point of making a point is right, but theoretical problems of the legal inspection such as the concept, connotation, scope and method need to be detailedly argued. In addition, not all inspections can be considered to be in the nature of administrative supervision, and apply administrative monopoly. The second opinion is not comprehensive. Regardless of the inspection division, at least part of the legal inspection belongs to the inspection of administrative supervision, which is required by the public security guaranteeing, so it's compulsory, non-profit, external, and the government's bottom line of safety, so it can neither be considered marketized technical service because the service cannot be compulsory; the third opinion is not feasible. Although the nature and function of supervisory testing of the production link is similar to its certification, the regular inspection and the product nature and function aren't the same. Moreover, China's third-party intermediary is still not mature, so it's not feasible to transform a large amount of public institutions into third-party intermediary institutions within the short term.

3. Adopt "One Divided Into Two" and Establish the Right Reform Model

Based on the above analysis, and starting from the theoretical logistics of guaranteeing public safety, the legal inspection is defined as the inspection provided by laws and regulations, and it's further classified as enterprise self-inspection and state mandatory inspection. The enterprise is the first responsible person for guaranteeing safety, and to guarantee the equipment safety through self-inspection is its due legal obligation, but the self-inspection implementation method is decided by itself, which can be implemented based on ability conditions or entrusted to professional inspection institutions. On behalf of the state, the government special equipment safety inspection institution performs the supervising and management duty, supervise and check the situation of enterprises performing legal obligations, and inspect the safe situation of inspection equipment when necessary. Such compulsory inspection is defined as the administrative confirmation of various special equipment production and

utilization license, and its administrative, namely, the government safety supervisory institutions or government authorized institutions conduct necessary inspection of special equipment produced by certified enterprises and those after registered and used in accordance with specified limits of authority and procedures, judge if issued license constantly complies with the demand, and then take necessary administrative measures. Due to the testing technical nature and limitations by government ability, in general it cannot be implemented by the government by itself, but can be implemented by testing inspection technical institutions established or authorized by the government.

In order to simplify the argument, the most controversial regular inspection is chosen for in-depth analysis. In accordance with the above theoretical framework of “one divided into two”, the special equipment regular inspection is divided into enterprise self-inspection and state mandatory inspection. Enterprises perform the entity responsibility for safety, and are obliged to self-inspect their used special equipment, including the daily inspection, regular inspection by month, quarter and year, regular inspection according to inspection cycle, non-destructive testing, safety accessory inspection, find and eliminate safety hazards. On this basis, the government authorizes inspection institutions to implement the compulsory inspection based on certain inspection cycle, and adopts the means of spot inspection to supervise and check the equipment safety management and self-inspection situation. In addition, the government should confirm if the enterprise and its equipment constantly comply with permissive conditions in accordance with inspection results. Thus, it can adopt means of hazard rectification, regulated application, suspended application, forbidden application, cancelled application registration, compulsory scrap to prevent the accident.

The special equipment legal inspection is divided into enterprise self-inspection and compulsory inspection, which is scientific and feasible. First, the theoretical logic and concepts are clearer. It has changed past practices of inspection classification by technical methods, and classifies according to the inspection nature, location, function and responsibility, inspect the legal relation, and clarify the right-obligation relationship between relevant subjects. Second, the security responsibilities are clearer. The enterprise self-inspection has reflected its entity responsibility for safety, and the compulsory inspection has reflected the government regulating responsibility. Their clear nature, location, function and responsibility have changed the unreasonable situation that enterprises don't self-inspect, rely on the legal inspection, supervising and inspection institutions perform the corporate responsible on behalf of enterprises, and also changed the chaos state of inspection institutions of different natures such as public institutions, self-inspection units and enterprises are engaged in inspections of different natures. Third, the convergence with other aspects of reform is closer. The enterprise self-inspection can adopt the form of autonomous commission, and select different types of special equipment inspection institutions to complete self-inspection business through market mechanism, so as to provide the space for inspection market reform. Inspection institutions in the nature of enterprise are mainly commissioned to work on enterprise self-inspection, but fail to give a full play. The compulsory inspection is mainly implemented by non-profit public institutions, which emphasizes its non-profit attribute, match with the classified reform demand of public institutions “separate the government from public institutions, separate public institutions from politics, separate the administration from implementation, separate the profit-making and non-profit institutions”. In this way, it won't cause huge impact on existing mechanisms, and help control the eager of making profits and blind expansion of current non-profit special inspection institutions; it will establish the existing inspection to be the nature of administration, and restrict inspection items within a smaller scope. In this way, it's beneficial to resolve various problems such as the increasing prominent contradiction of special inspection working personnel, the un-science of some inspection items and methods, poor quality, unreasonable charges.

III. Top-Level Design of Special Inspection System Reform: Discussion-Based Practices

After the determination of the principle, path and mode of special inspection system reform, the key point is the arrangement of practice operation methods. During the practice of promoting the special inspection system reform, it's necessary to clarify some misunderstanding in recognition, seek for wide consensus and support, form the force to reform; meanwhile, we should master the reform emphasis, intensity and pace, and improve the harmony of reform measures.

(I) Clarify the Misunderstanding of Special Inspection System

Among current theoretical discussions and practices of special inspection system reform, the misunderstanding of special inspection marketization and internationalization will further influence the selection of reform paths and modes further influence the interest allocation and justice after reform, so it's necessary to clear up misunderstanding.

First, it's about marketization. Although the inspection marketization is the development direction, the marketization is not ideal, so we cannot expect to resolve all problems through marketization, because the market is not almighty and the market has its own problems. To clarify the object scope of the marketization, it cannot adopt a sweeping approach and marketize fields which shouldn't be marketized. The public safety and compulsory inspection of administrative nature are targeted at fields with potential market failure, obvious public article attribute and possible market externality, which cannot be simply marketized. In addition, the marketization must start from actual situations, stick to the "progressive reform" instead of the "radical reform", let alone "shock therapy"¹. If all testing and inspection institutions are pushed into the market at one time, it cannot achieve the expected objective, but will cause chaos.

Second, it's about internationalization. Learning overseas advanced experience and taking the international road give no cause for criticism, but throughout major countries and regions in world, the special inspection field actually has no so-called internationally-accepted and unified mode. Under the WTO framework, the public safety field in all countries aren't open to the outside, so is the special inspection, and each country has its own mode. Still taking the regular inspection as the example, USA implements the parallel mode of government agency inspection, recognition and supervision, and the insurance company inspection; countries such as Canada and Japan implements the mode of government supervision, and implementation organized by non-profit institutions established or authorized by the government; and European countries mainly implement the mode of government supervision and implementation by authorized third-party institutions. China takes the socialist road with Chinese characteristics, so it should start from national situations, drawn on international advanced experience, and establish the special inspection mode with Chinese characteristics instead of simply and abstractly talking about the internationalization.

(II) Concerns about the Coordination of Special Inspection Reform Issues

The special inspection reform is a complicated system project, so we should build and comprehensively apply the strategic thinking and system thinking, consider current reform trail projects and long-term development direction, consider China's basic national situations and international development trend, consider the industrial management institutional reform and national macro-system reform, consider the safety supervisory system and special inspection system reform, master the reform emphasis, intensity and pace, and reinforce the harmony of reform measures.

First, grasp the focus of reform. The "one divided into two" classified reform method can be applied in the existing legal inspection, and the most fundamental and critical work is to resolve the problem of scientific classification. We should summarize historic experience, compare domestic and overseas situations, analyze the current situation and problems, master the trend and tasks, reinforce the fundamental theory and method studies, clarify the nature, location, function, duty and interrelation of various inspection, clarify the inspection and test, and define implementation method and supervising method of various testing and inspection. On the basis of this, we should keep pace with the reform of state public institutions, clarify the inspection and test, and define implementation method and supervising method of various inspection institutions, classify special inspection institutions, define the organization form, operation mechanism and supervisory method of various inspection institutions. The classification method is an important theoretical basis and method support for the special inspection system reform.

²Second, grasp the intensity of reform. The starting point and foothold of the special inspection system reform is to realize the sustainable development of the special inspection work instead of the total rejection and new start of existing effective system. We should master the reform intensity, and starts from fields with acute contradictions, extensive attention and complete conditions, for example, the regular inspection of elevators and complete sets of petrochemical devices, the supervision and regular inspection of lifting cranes. We should start the pilot projects and accumulate experience. The rapid increase of special equipment number and huge growth of inspection business work have provided good conditions and leeway for the reform. In addition, we should adopt the method of reserving stock and emphasizing reforming the increased, try not to damage vested interests of various special inspection institutions and endeavor to realize "pareto improvement"² to gain involved parties' support for reform.

Third, grasp the rhythm of reform. We should stick to the "progressive reform", and targeted at different contradictions at different states we should master the reform pace, cannot skip from the large environment of state macro-system reform, cannot get rid of the reality and advance too quickly. The special inspection system reform is closely related to the safety inspection and public institutions reform, so it should match the state macro-system reform to avoid chaos, and increase reform risks and cost. The special inspection system reform is also related to the special inspection

¹ The medical term of Shock Therapy was introduced by the economic field by the American economist Jeffrey Sachs in the middle of the 1980s. Based on the Bolivian economic crisis, Sachs put forward a complete set of economic programme and economic polices, and the main idea is to implement the tight monetary and financial policies. Because of the powerful impact of the implementation of the economic programme and policies, it may cause the huge vibration to the social economic life within the short term, and may lead to the "shock" state, so it's used by economists to show the radically marketized reform mode.

legal construction. For example, the “one divided into two” must start the reconstruction of special inspection rules and regulations accordingly, reasonably dismantle inspection items, content and methods; otherwise, the special inspection reform will be difficult to operate. However, the reconstitution of special inspection rules and regulations will be a progressive process gradually intensifying the enterprise self-inspection and reducing the compulsory inspection, and will transit to a good state dominated by the socialized and market inspection and assisted by the administrative supervision, verification and inspection.

IV. Conclusions

The prevailing special inspection system has maintained some characteristics of the planned economy, and the market mechanism cannot effectively allocate various resources of inspection institutions and cannot guarantee the prompt supply of accurate quality safety information to the market and society. The nature, location, function, responsibility, mutual rights and obligations of different classifications of inspection and inspection institutions need to be clarified, and the contradiction between special equipment safety inspection supply and social safety demand becomes more obvious, especially against the background and new trend of government institution reform, function transfer, streamline administration and institute decentralization, and release of market vigor, it's in urgent need of further deepening the special inspection mechanism reform. The performed special inspection system reform still stays at the surface, and is restricted by multiple system mechanism factors. In addition, the consensus hasn't been reached inside the system and the society, so it's more impeded by the interest pattern adjustment and needs the path to redesign the reform.

Under the target guidance of guaranteeing safety, serving economic and social development, the special inspection system reform should clarify the interrelation between the government and market, and between the government and society, promote the role return, accelerate the supervisory function transfer of special equipment safety, promote the government supervisory institutions to simplify the administration and delegate power to lower levels, and apply the “one divided into two” policy to the current legal inspection, namely, the enterprise self-inspection and state compulsory inspection. On one hand, we should let go and allocate corporate, social and market rights and obligations, release the social and market vigor; on the other hand, the government should shoulder the safety supervision work, and perform due duties. At the meantime, starting from the reality of China's quality safety situation, we should stick to the “progressive” marketization and the internationalization with Chinese characteristics.

To sum up, we should master the overall situation of special inspection history, current situation and development, do well in the top-level design of the reform scheme, adopt the classified reform mode of “one divided into two”, improve the scientificity and coordination, actively and steadily promote the special inspection system reform, and drive the scientific development of special inspection work and special equipment safety work.

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Analysis on the Reform of Special Equipment Inspection System

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Abstract: Special equipment inspection system is an important part of the special equipment safety supervision system. It is now still in a strong color of planned economy with a necessity to be reformed as the role of market to allocate resources has not been played enough and an effective competition system has not been established. Now the reform of special equipment inspection system is restricted by a variety of factors and the progress in different regions is uneven. There is no unified understanding in the direction and path of the reform and it is hindered by the coordination of interests. Starting from the perspective of safety, based on the theory of nature, position, roles and responsibilities of the inspection, through the analysis of administrative supervision, technical service and product certification, this paper proposes a model of “one divides into two”, which means a separation between the self-inspection and the national mandatory inspection. To be more scientific and coordinated, we should pay more attention to the stress, the intensity and the rhythm of the reform.

Key Words: Special Equipment; Inspection System; Reform; Top-Down Design

■ Commissioning Editor: Liu Jinbo

Thinking on China Special Equipment

Inspection Supervision¹

—— Based on the Perspective of New Public Management

Jia Guodong

Abstract: With the continuous economic and technical development, China's special equipment inspection and supervision shows some points to be improved and are mainly reflected in the unclear responsibility of the government, enterprises and inspection institutions, the lack of regional coverage principle execution, the indefinite legal standard relation, the gap between existing legal standards and demand of market economy and technical progress. This paper holds that the new public management theory has reflected the tenet of special equipment inspection and supervision, has enriched the content of special equipment inspection and supervision, and has provided the development power of special equipment inspection and supervision. On the basis of new public management theories, this paper proposes to establish the special equipment classification and supervisory system, define the boarder of legal and illegal inspection, implement the inspection institution reform, open the socialized inspection market, clarify the relation between laws and standards, and set up a special equipment inspection regulations and standard system complying with the demand of market economic system and technical progress.

Keyword: Special equipment; new public management; testing and inspecting; regulations and standards

I. Introduction

At present, the special equipment is widely applied in various fields of China's economic construction and people's life, and has become the indispensable production device and life facility in China's social production and people's life. The inspection and supervision of special equipment is not only related to the public life and property safety, but also related to the social stability and economic development. In recent years, China's special equipment inspection and supervision system has been constantly completed, but some problems still need to improve. Especially recently, the frequent special equipment quality accidents make urgent for us to improve special equipment inspection and supervision system. In accordance with statistics of General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, in April, 2013, there were 22 special equipment accidents, 2 boiler accidents, 2 pressure vessel accident, 1 gas cylinder accident, 4 elevator accidents, 6 lifting crane accidents, one dedicated motor vehicle accident in site (plant), one giant entertainment facility accident, one house lifting crane mechanical accident, 4 related accidents, and 21 casualties. Compared with the same period in 2012, the total accident number in April increased by 3, up by 15.79%.

At present, many scholars have conducted studies on completing the special equipment inspection and supervision. Seen from existing research literatures, studies mainly start from the following aspects: Firstly, the enlightenment on completing China's special equipment inspection and supervision from the perspective of domestic and overseas research. For example, Chu Lin (2008) has put forward the location and interrelation of laws and regulations in China's special equipment inspection and supervision laws and regulations; in addition, Chen Gang, Xie Tiejun and Song Jihong et al. (2007) have conducted comprehensive studies on domestic and overseas special equipment standards and regulations. Secondly, studies targeted at the special equipment inspection and supervision in specific regions and fields. For example, Yang Weizhong and Feng Weiping (2009) took Fujian Quanzhou experience in exploring special equipment supervisory model, proposed special equipment inspection and supervision, and suggested to implement the entity responsibility of enterprises and public institutions for the safe production in using special equipment, and implement the "one vote veto" system; Li Dangjian, and Luo Wenbin (2011) took Jinagxi for example, and proposed that the special equipment inspection and supervision should implement the key supervision, classified supervision and scientific supervision; Wang Libo and Liu Qiyun (2013) analyzed the special equipment safety supervision in Longjiang Forest industry and proposed to establish the mandatory inspection system of the special equipment. Thirdly, the function and level of special equipment inspection and supervision are studies. For example, Feng Li, Xiao Beiyang,

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and Wang Wenbin (2012) proposed the right treatment supervision and service relationship of special equipment inspection supervisory function implementation; Fu Dongliang (2013) analyzed the decision-making of the government and enterprises in special equipment inspection, supervision and utilization through the construction of government - enterprise game model, and put forward proposals of strengthening China's special equipment inspection and management level.

To sum up, those literatures are mostly established from the single perspective of special equipment government management departments, offer suggestions on practices of special equipment testing and supervision, and lack of theoretical discussions on the scientificity of current special equipment inspection and supervision. This paper applies new public management theories and conducts the theoretical analysis of special equipment inspection and supervision with an aim to offer effective advises for the improvement and completion of special equipment inspection and supervision. This paper is arranged as follows: Part I analyzes the research background and review existing relevant literatures; Part II points out shortcomings of existing special equipment inspection and supervisory system; Part III applies new public management theories and theoretically analyzes China's special equipment inspection and supervision; Part IV offers relevant proposals on the enhancement of special equipment inspection and supervision quality based on new public management theories.

II. Shortcomings of China's Special Equipment Inspection Supervisory system

Law of the People's Republic of China on the Safety of Special Equipment was approved by Standing Committee of the National People's Congress on June 29, 2013 and will be implemented on January 1, 2014. Before this law is officially implemented, the supreme state laws in special equipment field is Regulations on Safety Supervision over Special Equipment issued by the State of Council in 2003, and this supervision was slightly modified in 2009, which has been used for 10 years till now. In accordance with Law of the People's Republic of China on the Safety of Special Equipment, the special equipment refers to boiler, pressure vessel (including gas cylinder), pressure pipes, elevators, lifting machineries, passenger ropeway, giant entertainment facilities, dedicated motor vehicles in site (plant) which poses great risks to the life and property safety and other special equipment provided by administrative regulations by the above law. The special equipment is indispensable infrastructure and facilities for people's production life, and its safety situation is directly related to people's life and property safety, and the economic operation safety. With the economic and social development and the technical improvement, the special equipment is more closed to economic and social development. In 2006, State of Council Development Research Center submitted the special report to central government leaders and pointed that the sales revenue of industries with the special equipment as major production equipment account for 64.13% of GDP. In accordance with provisions of the Law of the People's Republic of China on the Safety of Special Equipment, classified and whole-process safety supervision and management is applied to special equipment, covering all links such as production (including design, manufacture, install, modify, and repair), operation, application, inspection and test and so on. Among all links, the inspecting and testing link is of vital importance, and the right implementation of inspecting and testing plays a crucial role on the safety of special equipment after applied in future.

China's special equipment inspection and supervision system is mainly characterized by "regional coverage, clear responsibility for inspection and supervision". Within a long period, this system has played a vital role in guaranteeing special equipment safety and arousing local inspection institutions' enthusiasm. With the constant development of China's economy, China's independent safety responsibility has been gradually implemented and testing and inspecting technical level has been enhanced greatly. Meanwhile, some fields are proven to be defective and are mainly reflected in the following aspects.

(I) Unclear Responsibility Relation of the Government, Application Unit, and Inspection Institution

In terms of the responsibility, the currently implemented *Regulations on Safety Supervision over Special Equipment* clearly provides that the Bureau of Safety Supervision of Special Equipments, State of Council should be responsible for the safety supervision of national special equipment, and local departments of the country level and above for the safety supervision of special equipment within limits of jurisdiction; special equipment production and application units should establish the sound special equipment safety, energy conservation management system, post safety, energy conservation responsibility system; person chiefly held responsible for special equipment production and application units should be comprehensively manage the special equipment safety and energy conservation; special equipment inspection and testing institutions should conduct inspection and tests in accordance with laws and regulations, and shoulder the legal responsibility for inspection and testing results and conclusions. Above provisions have clearly showed that the special equipment safety is the first responsibility of application units in terms of the safety entity responsible, and the government should be responsible for supervision, and inspection institutions should be responsible for inspection. However, in actual execution, obvious deviations exist and are mainly reflected in the planned economy features of special equipment safety inspection practices, unclear function positioning, too broad, too trivial and excessive problems, offside, malposition and omission during the transition from the planned

economy to the market economy. Due to work positioning deviation, the “nanny” whole-process supervision method objectively comes into being, and it makes the enterprise rely on the government, weakens the initiative of enterprise safety management, fuzzy up the safety responsibility limit, and weakens and even substitutes the government to bear the entity responsibility of the first responsible person. In some places, some units using special equipment even shift the responsibility for special equipment safety to the government and inspection institutions, and think that it has nothing to do with itself.

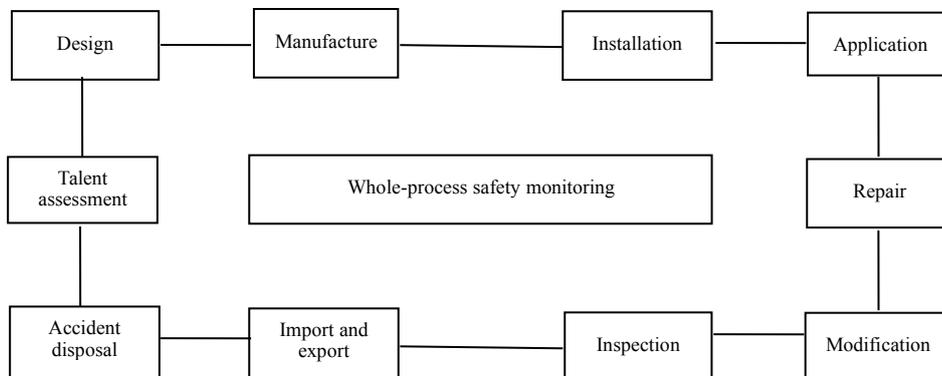


Figure 1 Schematic diagram of special equipment whole-process supervisory model

(II) The Basic Role of Market Allocation Inspection Resources is Weak

In recent years, active fruits have been achieved to the optimized allocation of inspection resources through the combined reorganization of inspection institutions. However, China’s existing special equipment testing and management system is characterized with the planned economy, and the fundamental role of inspection resources allocated in market isn’t made its full use. All special equipment in a region adopts the plot method, and is undertaken by one or several government-affiliated inspection institutions. Some local inspection work increases rapidly, but the inspection force inside the system is obviously lacking and the social inspection power is weak, so some equipments are difficult to be radically inspected and government-affiliated inspection institutions have to bear the undeserved joint liabilities. Compared with the increase in the number of supervisory targets, that of safety supervisory personnel and inspection institution personnel slows down. It can be found from Figure 2 that from 2007 to 2012 the annual average growth rate of safety supervisory personnel is about 5.53%, and that of the inspection institution personnel is about 6.12%. Compared with the annual average growth rate of 13.13% of the supervisory personnel, there is an obvious contradiction between the lack of labor resources and the increase in work amount. In addition, some government authorities of inspection institutions is centered on the pursuit of economic benefits, and regard the inspection income as inspection institutions’ assessment objective, so the non-profit nature of inspection institutions are seriously impacted. In the meantime, the special equipment inspection is a technical activity with serous object differentiation. Due to relatively closed inspection market, the pressure and power for reform development and innovation is not enough, especially the lack of driving force to technical progress, which has greatly influenced the technical development of the overall special equipment inspection industry.

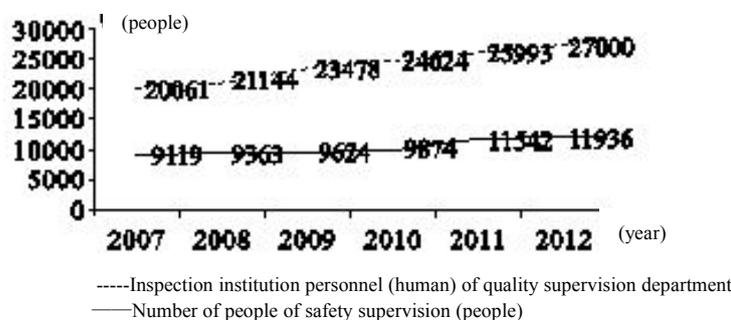


Figure 2 Variation diagram of the number of special equipment supervision and inspection personnel from 2007 to 2012

Data source: Report of National Special Equipment Safety Situation, 2007-2012.

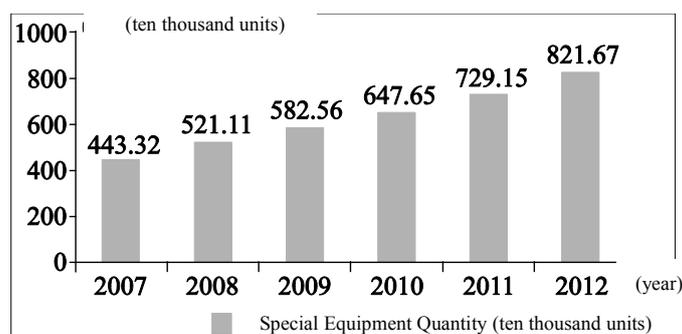


Figure 3 Tendency chart of national special equipment growth from 2007 to 2012

Data source: Report of National Special Equipment Safety Situation, 2007-2012.

(III) Unclear Relationship between Safety Technical Specification and Inspection and Testing Standards

The safety technical specification requires departments responsible for special equipment supervision and management to perform duties, implement provisions of laws and regulations, and basic safety requirements; the standard is a general provision made by all parties after negotiation for the sake of uniform products. Safety technical specification should lay the emphasis on the basic safety requirements and management requirements, doesn't involve much specific implementation methods and technical methods but provides the basic demand of special equipment safety. However, due to historic reasons, provisions by laws and regulations have been adopted in the inspection technical field of special equipment, and the technical standard field is basically blank, which has resulted in meticulous provisions on specific technical activities by laws and regulations and great rigidity, so when external conditions change, it fails to be updated synchronously and causes a series of contradictions.

Taking the pressure vessel and pressure pipe inspection for example, the basic technical route of existing regular inspection technical specification of pressure vessel and pressure pipe in China is to find defects, evaluate the safety level of vessels and pipes based on defects, and then determine the regular inspection cycle of vessels and pipes based on the safety situation. This technical route has been shaped in early 1980s, and is targeted at the universal serious defects of pressure vessels and the "congenital deficiency" in manufacturing quality, which classifies the safety situation in accordance with "applicable" principle, phase out equipment which cannot guarantee the safety application, reserve and manage equipment which have primitive manufacturing defects but can be safely used by levels. Practices have proven that the current regular inspection specification is applicable to the regular inspection of general pressure vessels and pressure pipes huge in number and widely applied. But with the rapid development of China's economy and constantly technical progress, the regular inspection of pressure vessels and pressure pipes are confronted with some new problems. On one hand, pressure-bearing devices tend to giant sizes and high parameters, so more operation risks and unpredictable factors emerge and the inspection difficulty is larger. Many new technical problems cannot be totally resolved by the current specification due to a lack of corresponding technical standards and basic data support. For example, raw materials of many oil refining equipment in China have change from low-sulfur, low-acid to high-sulfur and high-acid, and in consideration of poorer deteriorated working conditions, inspection, testing and result judgment are much more complex. If inspection technical routes and corresponding inspection specification are not under the premise of failure mechanism, are not centered on the residual equipment life, the selection of inspection methods and inspection cycles will be greatly blind, which will cause safety hazards in future. On the other hand, since China's accession to WTO and global integration, the objective demand of long-cycle equipment operation is proposed. And in terms of the process industry, the most effective method to reduce cost is to prolong the operation cycle of complete equipment. Compared with overseas situation, the overhauling cycle of China's complete equipment is much shorter. In consideration of the impact of single equipment on upstream and downstream production, Chinese enterprises have significant disadvantages in the competition of operation cost. In consideration of the above, application units of domestic large pressure-bearing complete equipment have proposed the demand of prolonging the device overhauling cycle. However, in spite of rigid legal provisions for the inspection cycle, it is contradictory to the long-cycle operation; meanwhile, the primary premise of the long cycle is the safety. Without the safety, the long cycle will lose its meaning. It's obvious that the traditional inspection idea of fixed cycle, fixed verification method, frequent shutdown cannot meet this demand.

III. Theoretical Basis and New Public Management Theories of Optimizing China's Special Equipment Inspection and Supervision

(I) Background and Main Content of New Public Management Theories

New public management theory rose in western countries such as Britain and USA in the 1980s, and is an innovative public administrative theory and management mode. It has its own theoretical basis of modern economics, and proposes that public sectors such as government should widely adopt successful management methods and competition mechanisms in private sectors, emphasize the output of public services, pay attention to the influence of civil officials on the social public, and advocate the flexible and effective management of human resource administrative links such as the personnel employment and tenure.

New public management theory is targeted at and criticizes the government-market relationship in traditional administrative theory. According to traditional administrative theories, if one of government and market waxes, the other waxes, so they are contradictory. However, new public management theory holds that the public sector should make full use of the fundamental role of the market mechanism, get integrated with the market mechanism, and seek for the market mechanism expansion under the premise of precise positioning of government departments' core functions. This theory advocates making the best use of market functions, and taking full advantage of the market competition mechanism and efficiency mechanism to improve public sectors. This is the basic value orientation of the new public management theory. In *Public Management and Administration: An Introduction*, Owen E. Hughes writes: "A large amount of evidences show that the private market is superior to government or political market. If the role of the government in providing commodities and services can be weakened, the overall economy will gain benefits from it. Compared with the market and unmanned bureaucracy, the market has better responsibility mechanism. (Owen Hughes, 2001)

In *Reinventing Government*, famous scholars Osborn and Gabler have proposed new public management theory, which has been widely accepted. It mainly includes: 1. The government should be "helmsman" instead of "oarsman". The new public management theory proposes to divide the government policy formulation (helmsman) and policy implementation (oarsman). In order to realize the separation, the new public management theory proposes that the government should center on the steering function, namely, the decision-making function, for example, drawing up laws and regulations, establishing appropriate incentive restriction mechanism, and supervising the contract execution. But the provision of public services, namely, the execution function, is undertaken by the market and society by the means of privatization. 2. Introduction of modern management methods. New public management theory suggests that management has interlinked nature. If the public sector introduces modern enterprise management concepts and methods, the government work efficiency will be greatly enhanced. For example, using the public management concept to construe the organization culture of public sectors; implementing project budget, performance evaluation, customer first, output control, human resource development, and other management practices by the public sector. This is the most effective way of inner workings of government reforms. 3. The implementation of performance management. The performance management is the evaluation of service quality, customer satisfaction, cost, and revenue efficiency, which follows and monitors the whole process of the public sector providing public services on the basis of existing public service performance objective to obtain the systematic performance evaluation. The performance evaluation of public sector conforms to "3E" standard, namely, economy, efficiency and profits. 4. Introduce competitive mechanisms. The new public management advocates enhancing the public service quality through competition. It proposes to use the market power to reinvent the government, and competition should be launched between the public sector, private department and public institutions to enhance the efficiency of public service supply. 5. Customer-oriented. The new public management theory proposes that the social public the "customer" of the government, and the government should aim at "customer satisfaction". This requires the government to promptly react to customers, provide the chance for customers to actively participate in government decision-making, and regard the customer satisfaction as an important benchmark for the government work.

(II) New Public Management Theory Reflects the Tenet Of Special Equipment Inspection And Supervision

The new public management theory has reflected the tenet of special equipment inspection and supervision. As the scholar says "new public management should mainly focus on the efficiency, and when the problem emerge when the output arises from the input, the efficiency is the primary problem. Under such situation, the new public management should be considered, but it cannot guarantee the optimum governance mechanism. (Jane-Erik Lane, 2004) New public management theory emphasizes that the primary government value is reflected in economy, efficiency and effectiveness. It has proposed to introduce the competition mechanism, orient towards the market, change the government operation mode, and construct the "entrepreneur" government. In this way, it can enhance the government efficiency and efficacy, optimize limited administrative resource allocation, and obtain the optimal social and economic benefits. However, the special equipment supervision and supervision is targeted at the high efficiency of administrative activities, and its tenet is to "improve the supervisory management, and enhance the supervisory efficiency". It can be found that both are similar in objective and tent, and it's possible that the new public management theory guides the special equipment inspection and supervision.

(III) New Public Management Theory Enriches the Connation of Special Equipment Inspection and Supervision

The new public management has changed the relationship between the government and the public, so the government becomes the people-oriented

service provider instead of the authoritative bureaucracy issuing orders, and the government public administration becomes the “service administration” instead of “governance administration”. The citizen is the customer enjoying public services, and the government is oriented towards the customer demand, respects customer rights and insists on the service orientation. The new public management focuses on the effectiveness of government project implementation, and reflects the objective-oriented trend. The administrative power and administrative behaviors belong to and serve the center of “customers” satisfaction. The new public management thinks that the government is the responsible entrepreneur, and the citizen is the respected “customer”. The special equipment safety is directly related to the life and property safety and economic development safety, and the utmost objective of the special equipment inspection and supervision is to guarantee the special equipment safety and implement the core concept of “people-oriented”. This requires to establish the tenet of serving the people heart and soul, increase the inspection and supervision efficiency, “work selfless and diligently for the people”. At the meantime, it fully considers civil servants’ ability, demand and wishes, include civil servant’s behaviors into the legal and reasonable scope, and establish the diligent, clean, pragmatic and efficient image.

(IV) New Public Management Theory Provides New Impetus for the Development Of Special Equipment Inspection and Supervision

The “reinventing government” theory in new public management has provided new impetus for the development of special equipment inspection and supervision. The new public management theory holds that the government function is to “steer” instead of “paddle”; meanwhile, the government should be the “competitive” government, and the government should reasonably define the management object and scope, reasonable set up organizational structure, and introduce the competitive mechanism into the public service field. In this way, it can make the administrative organization rational and orderly, provide better services for the public, change the government function, and increase the government administrative efficiency. All above aspects have injected new power to the development of special equipment inspection and supervision.

IV. Apply New Public Management Theories to Enhance the Quality of China’s Special Equipment Inspection and Supervision

Targeted at the unclear inspection responsibility relationship of the government, application unit and inspection institution, the weak fundamental role of inspection resources allocated in market, and ambiguous relationship between safety technical specification, testing and inspection standards in special equipment inspection and supervision, this paper thinks that the new public management theory can provide specific theoretical guidance for urgent problems in those practices, define the reform direction, and enhance the inspection and supervision quality.

(I) Implement Classified Management, Specify Responsibilities of the Government, Application Units, and Inspection Institutions

As envisioned by new public management scholars, the government should relax control, release power to the market and society, and in terms of the public articles and service supply, except core services, the government should hand over any possible public services to market participants on the basis of competition. The service provided on the basis of market and social competition has better effect than that provided only by the government; meanwhile, it can reduce the government burden, specify the responsibility of the government, market and society. Confronted with numerous types, large number and rapid increase of special equipment, the classified supervision should be implemented, which is not only beneficial to the supervision, but also enhances the efficiency. Specifically speaking, one is the classified equipment supervision. The electromechanical equipment is different from pressure-bearing equipment, large equipment different from small equipment, fixed equipment different from mobile equipment, public site equipment different from mining enterprise equipment, system equipment different from stand-alone equipment. Thus, different methods should be adopted for different equipments, and the scientific, standardized and classified supervision guidance should be adopted on the basis of risk analysis. Secondly, the classified enterprise supervision, the enterprise classification should reflect the orientation of government entity responsibility in concept, and classify enterprises according to the management level, and supervise in different methods. Simply speaking, the application unit is capable of managing its own special equipment, shoulder the entity responsibility for safety, let application units for self-management, and adopt the method of enterprises registering the equipment; the application unit with weak capability or unable to manage due to various reasons, the government should help it shoulder the responsibility.

(II) Figure out Inspection Nature, Reform the Pattern of Inspection Institutions, Realize the Unification of Government Legal Inspection and Market Illegal Inspection

The new public management theory thinks that as other social organizations, the government plays a critical role in the current society, but it isn’t the omnipotent government, so the government must reform and become “effective” government, and the government should intensify the sense of

responsibility and improve the adaptability and own transparency construction; at the meantime, the government should keep a “low-profile” in society, which doesn’t mean to ignore and weaken government functions, but as Osborne points in *Reinventing Government*: that “the government should play the role of catalyst and promoter in the public management, and act as the “helmsman” instead of “oarsman” (Davis ·Osborne, et al., 2006) That is to say, the government should be freed from enormous affairs of economic entities and social groups, and hand over the affairs which the society is capable of to the society.

The legal inspection and illegal inspection boundaries of China’s special equipment isn’t clear; in addition, the unclear boundary between inspection items in category permitted by the administration and charged with administration fees and those belonging to inspection items of technical service resulted in that the non-profit image of inspection institutions is damaged and has directly influenced the authority of government supervision. To resolve the problem, in accordance with new public management theories, the government should consider the supervision and inspection institutions’ quality first instead of supervision and inspection institutions’ tasks, and inspection tasks cannot be assigned by the government by regions. In addition, it should explicitly show the compulsory inspection scoped with administration fees, cannot expand and extend arbitrarily, and make it inspection institutions’ profit-making tool. This paper thinks that the so-called legal inspection, namely, the compulsory inspection should be the basest inspection item guaranteeing the equipment safety, and its discretion space is quite limited and mainly should belongs to the supervisory spot check or formal examination. It represents the government authority, but inspection items with huge technical differentiation and with social institutions involved should be market- oriented. Of course, one of preconditions for drawing a clear line is the clear-cut relationship between compulsory laws and technical standards.

In terms of inspection institution reform in future, this paper proposes two methods: one is that the government reserves part of purely non-profit inspection institutions, similar to government laboratories or the extension of present safety supervisory institutions to conduct the compulsory inspection dominated by the supervision and spot check. The inspection behavior should adopt the method of government payment, and cannot directly charge inspected units. However, non-compulsory inspections should be completely market- oriented and implemented by socialized inspection institutions through market competition. The other is that all inspection institutions in quality inspection system are converted to the non-profit third-party institution. Non-profit third-party institution refers to fields involving the public safety, and serves the country and society, which transfer trust among government, society and the public, and is recognized by relevant state authentication bodies after the strict qualification assessment procedures. In addition, it’s an supervision and management committee jointly participated by relevant interest parties organized by the government, and is the non-profit institution supervising the third party’s nature. It must own the following four conditions: firstly, it has no investor; secondly, it has no dividend; thirdly, it cannot get listed; fourthly, it cannot work on operational activities such as special equipment design, manufacturing, installation, modification, maintenance & repair, sales and so on. The compulsory inspection is implemented by inspection institutions by the way of government purchasing services, and other inspections by independently selected by enterprises that compete equally. Regardless of the special equipment safety attribute, current situation of China’s special equipment safety supervision mechanism, or the basics situation and long-term development mechanism of domestic inspection institutions, the second method should be adopted because it’s more operable. Compared with the first method, its reform cost is less, the responsibility division between the government and society is clearer, and inspection institutions will undergo sustainable development in future.

(III) Organize Legal and Standard Systems, Reflect the Basic Safety of Laws and Technical Nature of Standards

The new public management should pay attention to efficiency, and if the problem emerges when the output arises from the input, the efficiency needs to be considered. Public service of the government needs to consider performance and cost benefits. At the meantime, the new public management thinks that the traditional public administration only emphasizes on the provision of service and ignores the prevention, so when problems emerge, a large amount of money and efforts need to be invested to handle it. The new public management thinks that the society needs prevention, namely, solving problems instead of providing services. Thus, the government should put more efforts on prevention. In terms of the relation between laws and standards, because the safety technical specification is the basis safety demand and management requirement proposed by government authorities to implement the department responsibilities in accordance with laws and regulations, and is the specific demand and measure of implementing laws and regulations, as well as the reflection of government’ management will, so specific implementation methods and technical methods aren’t involved. The safety technical specification can introduce technical standards, but this must meet the basis demand of safety, and any implementation method and technical method should be accepted, or it’ll impede the scientific and technical development. Standard is the product or method requirement, and it guides the implementation of production and technical methods, lays the emphasis on the link control and quality requirement (details), and is the reflection of mature technologies or methods. On the basis of meeting the basic safety demand, it should appropriately consider the advancement, practicability, economic cost, and all parties’ benefits. The standard reflects all parties’ benefits, and it is

oriented towards meeting market demand, and constitutes the technical support for safety technical specification. The standard must clearly state how to realize and meet the basis safety demand, and is an important (primary) route to satisfy the basic demand, but it's not the only way; when newer and more advanced technologies emerge, the standard should promptly reflect the scientific and technical progress. Laws and standards should be mutually integrated, develop harmoniously, don't repel each other, and constitute a harmonious and unified system with special equipment laws and standards. Such relationship must be implemented to the inspection link, and they should be compulsory inspection items in accordance with basic technical demand of laws, and other inspection should be implemented in accordance with technical standards. On one hand, the technical standard needs to meet the basic safety demand of laws; on the other hand, it should keep updating with the constant technical development; at the meantime, the standard should be market-based, keep abreast of scientific and technical development, and reflect the market demand.

Taking the regular inspection of pressure vessels and pressure pipes mentioned above for example, the regular inspection standard system of pressure vessels and pressure pipes in China emphasizes the solution of the "congenital deficiency" in manufacturing quality of China's pressure-bearing equipment 20 years ago from the perspective of establishment background, and it's a remedial measure instead of a prevention mechanism. If the system has basically resolved the "survival" problem, in the face of the objective demand raised by current economic development and technical advancement, the current work is the resolution of "development", and "nipping in the bud". If "finding defects"- "treatment" are used to summarize the current regular inspection standard system, the future system should be "mastering mechanism"- "preventing diseases". In fact, it's a problem of changing the industrial supervisory inspection concept.

Therefore, it's necessary to establish a new system, and this system includes two modules. The first module applies to general pressure vessels and pressure pipes huge in number and widely applied which basically follow existing laws and standards; the second module applies to large complete equipment with a demand of long-cycle operation and important pressure vessels under special working conditions. Laws under this module only provide the demand of most basic inspection safety technologies, and under this premise, in accordance with the principle of fully reflecting the enterprises' entity responsibility for safety, corresponding technical standards are added or completed to keep pace with international technical development, and the new supervisory inspection mode of pressure vessels and pressure pipes are formulated. Such mode should be under the premise of risk evaluation and dangerous source identification, and the inspection plan should be determined based on evaluation results from online testing and fitness for service, centered on the residual equipment service life, and defines the equipment inspection cycle based on residual service life. This module includes the following technical standards: typical complete equipment, inspection guidance and technical standards of typical equipment, risk evaluation standard, fitness for service evaluation standard, online testing and inspection standards, etc.

V. Conclusions

The special equipment is indispensable infrastructure and facilities for people's production and life, and its safety situation is directly related to people's life and property safety, and the economic operation safety. With the continuous development of economy in China, the implementation of autonomous safety responsibility of enterprises and the rapid enhancement of inspection techniques, it also shows some points to be improved and are mainly reflected in the unclear responsibility of the government, enterprises and inspection institutions, the lack of regional coverage principle execution, the indefinite legal standard relation, the gap between existing legal standards and demand of market economy and technical progress. From the perspective of new public management theory, this paper proposes that the government should relax control, release power to the market and society, and in terms of public articles and service supply, besides core services, the government should hand over any possible public services to market participants; the new public management theory holds that the government function is to "steer" instead of "paddle"; meanwhile, the government should be a "competitive" government, rationally specify management targets and scope; in addition, the government should think about the efficiency, and devote more time and energies to prevention. On this basis, we should establish special equipment classified supervisory system, conduct the classified management according to inspection behavior nature, draw the line of legal and illegal inspection, open technical testing and inspecting market, organize law-standard relationship, establish special equipment inspection legal and standard system consistent with the demand of market economic system and technical advancement. And its final objective is to guarantee the special equipment quality, and implement the core concept of "people-oriented" and "constructing service-oriented government".

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Analysis on China's Special Equipment Inspection and Supervision:

Based on the New Public Management Theory

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Abstract: With the continuous development of economy and science and technology, China's special equipment inspection and supervision has been exposed some aspects to be improved, that the responsibility of the government, the enterprises, and the inspection bodies is not clear, the covering principle needs to be performed, the relationship between regulations and standards is not clear and there is a deep gap between the existing regulations, standards and the market economy, technological progress. This article argues that the new public management theory reflects the purpose of the inspection and supervision of the special equipment, enrich the content of the special equipment inspection and supervision, and provide a driving force for the development of special equipment inspection. On the basis of the new public management theory, we conclude that the special equipment supervision classification system should be established, the inspection market should be opened to a certain degree, the line between the statutory and non-statutory inspection should be drawn, the relationship between regulations and standards should be cleared, and a special equipment inspection standard system should be established to be consistent with the market economy and the technology.

Key Words: Special Equipment; New Public Management; Inspection and Supervision; Regulations and Standards

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Establish General Food Safety Legislation Responsibility System¹

——Suggestion for the Amendment of the Legislation Responsibility in “Food Safety Law”

Du Yifang

Abstract: Considering that the low illegal cost constitutes the primary reason for the frequent food safety affairs, the operable comprehensive food safety law responsibility system should be established. We should establish the concept of enterprise as the first responsible person, regard the civil liability as the primary responsibility for food safety, complete articles of liabilities for tort, add articles about domestic supervisory system and responsibility for breach of contract, and establish the operable compensation mechanism; we should introduce administrative compensation responsibility system, and specific institution and procedures of existing administrative accountability; realize the linkage of criminal law responsibility and administrative penalties through judicial interpretation.

Keywords: Food Safety; Legal Responsibility; the First Responsible Person in Enterprise; Administrative Compensation

Illegal criminal acts of food safety should assume corresponding legal responsibility, and the social consensus should be reached. As a special product, the food is not only characterized by repeatability and daily nature, also closely related to people's body health and life safety, so in case of damages it'll result in irretrievable consequences. However, since the food industry came into being, food safety affairs in large or small scale have been emerging unceasingly. Center for Disease Control of America evaluates that about 76 million people fall ill because of foodborne pathogens, 325 thousand people are sent to hospital, and 5000 people die (Mead et al., 1999). Foodborne diseases not only influence the productivity, but also are equivalent to another tax imposed on body energy (FAO/WHO, 1984). Although food consumption is the private affair, but the disease caused by accompanying food safety will add pressure to medical service system and cause the loss of economic productivity.

The *Food Safety Law of the People's Republic of China* (hereinafter referred to as *Food Safety Law*) was issued on February 28, 2009 and 15 articles in Chapter IX “legal responsibility” have provided regulations on administrative penalties, civil compensations and criminal liability for illegal acts, and have played a crucial role in standardizing food production and operation activities, preventing food safety affairs, and guaranteeing the body health and life safety of the public.

However, at the meantime, with the frequent occurrence of food safety affairs such as melamine, Sudan red, swill-cooked dirty oil, the low criminal illegal cost is undoubtedly the primary reason for enormous food safety affairs. At certain level, this result reveals that some problems still exist in provisions of China's existing *Food Safety Law* in legal responsibility, for example, the backward content or low operability. Against such background, four years after the implementation of Food Safety Law, a new round of revision is started, and the voice for “governance by severe penalties” becomes louder. Of course, “severe penalties” does not only mean strict laws and frequent death penalty. The food safety governance is related to various links such as civil affairs, administration and criminal affairs, and a provision on food safety responsibility also needs systematic thinking. Therefore, the “severe penalty” should specify provisions and effectively implement various legal responsibilities for illegal criminal acts in food safety, define the food safety legal responsibility system at different levels and to different degree, develop and complete relevant laws and regulations during the dynamic process of repeated evaluation and reflection. In this paper, legal responsibility theories and government supervision theories are applied to analyze the constitution of China's food safety legal responsibility system, organize existing legal responsibility system, and targeted at different types of food safety legal responsibilities, opinions of the modification and perfection of *Food Safety Law* are proposed.

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I. Strengthen Civil Liability Mechanism: Self-Regulation and Compensation for Damages

(I) Food Safety: Who is to Blame?

Due to the frequent occurrence of food safety affairs, at early legislation China's existing *Food Safety Law* has adopted the supervisory pattern of reinforcing "command-and-control" (Gao Qinwei, 2012), and even impose exclusive regulations. As for the former, the food exempted from inspection are abolished (Article 60 in former law), and as for the latter, Chapter III has provided specific regulations on "food safety standard" and highlights the basic institution and formulation procedures of food safety standard setting in legislation technology (Chen Jun, 2009; Gao Qinwei, 2012).

In terms of the food safety responsibility design, existing food safety also emphasizes government supervision and weakens industrial organizations and enterprises' duty with the government duty. The government and corresponding administrative departments undertake the food safety responsibility, and excessively depend on traditional administrative management methods such as administrative permit, administrative inspection, administrative coercion, and administrative penalties and fail to implement the concept of "the enterprise as the first responsible person) and fail to realize the combination of government administration and enterprise self-regulation. The reason behind it is obviously that it's closely related to market failure and lack of honesty in food industry. Over past decades, Chinese society has rapidly transformed from the acquaintance society to the market economy, and the pursuit of interests has become the sole objective of many enterprises. After the outbreak of a series of food safety affairs, the public confidence in enterprise self-constraint falls to the low ebb, and voice of government intervening in market operation and government supervision in place of enterprise responsibilities lingers in our ears (State of Council, 2008). However, in practice, disadvantages resulted from government responsibility mode have surfaced. Taking melamine for example, in 2010 following the year the *Food Safety Law* was implemented, the melamine prohibited by State Food and Drug Administration returns to the market, which is obviously a heavy strike to the initially established government-led supervisory model. It indicates that in the current market economy environment, it will be not applicable if the food safety responsibility is totally handed over to the "omnipotent government" mastered by the government.

In 2013 institutional reform, it's obvious that the central level has noticed this problem. Statement about *State of Council Institutional Reform and Functional Transfer* points that "the food and drug supervision and management department should change the management concept, innovate the management method, give a full play to the role of market mechanism, industrial self-discipline and social supervision, and establish effective mechanism to make the production operator the first responsible person for food and drug safety. It can be found that one prominent characteristic of this institutional reform is the government functional change implemented in the food safety field, and reiterated concept of the food production and operation party as the first responsible person for food safety; correspondingly, it's the focus transfer of food safety affairs in legal responsibility provision, which makes the civil liability the primary responsibility for food safety legal responsibility system.

(II) Self-Regulation and Compensation for Damage

With the application of scientific and technical means in food field, the modern food formula, standards and processing technologies are more fine and highly technical, thus no matter how detailed the legislation or standardized legal documents are, they will leave broad discretion space for enterprises, and the enforcement cannot penetrate all procedures of each product link. Therefore, the way to realize food safety is to replace supervision by the market, which will weaken administrative means and emphasize the corporate responsibility. However, the key point is to realize the corporate and industrial self-regulation.

Self-regulation is a quite broad concept, and almost involves all aspects of non-government behaviors (Cary Coglianesse, 2013). Through the legal authorization or government commission, certain social organization assumes functions of public management and supervision, and shares the decision-making and execution during supervision, so it's of institutional significance of social self-governance (Tian Feilong, 2010). In the food safety field, the self-regulation refers that relevant food safety enterprises comply with internal corporate rules, state specification and standards or stricter specification and standards than national ones to formulate the specification and standards, control the corporate production and operation, mainly including quality management, information disclosure, responsibility consciousness, and technical improvement (Wang Guisong, 2009). Based on self-regulation, relevant food industries not only need to comply with legal obligations but also need to perform agreed obligations, namely, the purchaser promises that all products should meet the standard.

In fact, before the promulgation of existing *Food Safety Law*, China one tried the food safety self-regulation, but failed. Typical representative is exempt system on food. Under the premise of limited executive resources, the original idea of legislation of inspection-exempted system is to make administrative organs focus on supervision focus, and make relatively excellent enterprises realize self-discipline so as to reduce the occurrence of food safety risks as a whole (Xie Minqiang, 2008). However, due to the outbreak of Sanlu Milk Powder incident, the food inspection-exempted system collapses among public doubts (Shen Kui, 2009). In the final analysis, the occurrence of inspection-exempted system doesn't result from

institutional starting point, but the ignorance of corresponding supervisory measures and legal responsibilities during institution design. When rights, obligations and responsibilities lose the equity, relevant systems will break away from “cage” restrictions. The right method should be that while the self-supervisory system is established, careful arrangements should be made such as identification standards, procedures, follow-up supervision, and legal responsibilities in particular (Tian Feilong, 2010).

Therefore, it needs to emphasize that according to modern interpretation, and the self-regulation doesn't start from the social self-governance any longer, but should be implemented under the framework of a legal state. In another word, self-regulation is not only reflected in the enterprise incentives, but also constrained by legal responsibilities. Similar to the violation of legal liabilities, those in violation of agreed liabilities reflected by self-regulation should also shoulder corresponding legal consequences. Therefore, in the modification of existing Food Safety Law, the enterprise self-regulation and specific institutions during legislation should be further strengthened, and as an important part of civil liability system liabilities for breach of self-regulation should be specified.

(III) Implementation of the Compensation Mechanism

Of course, in terms of the relief system, the final objective of the relief system is to specify the compensation obtained after damages. Article 96 of existing stipulations on the compensation amount in Food Safety Law provides that for those who produce food failing to meet food safety standard or sell food failing to meet food safety standard which they are fully aware of, besides compensations for loss, consumers may request producers or sellers to pay compensations ten times more than the payment. However, in practice few consumers will file up punitive damage suit targeted at food safety. Firstly, the general food price is relatively low, so compensations ten times more than the food price is still not high; secondly, it needs a long and unexpected legislation process before the obtainment of compensations. Therefore, a majority of victims lose the power to claim compensations, and in turn the cost for production operators violating laws is reduced. Punitive compensation system is eventually reduced to "empty talk."

In consideration of the above, in order to enhance the deterring effect of the punitive compensation system, some scholars propose to improve punishing and deterring functions by establishing higher punitive compensations¹ or minimum compensations². With respect to the above opinion, I think that it's better to implement the existing civil compensation liability mechanism than drawing up more institutions, because it's just the pie in the sky. After all, no matter how strict the legislative regulation is, if it cannot be implemented, it'll be only the moon in water.

By the means of insurance and fund, the punitive compensation system will be operable. The food safety responsibility insurance is widely discussed during the law modification (*Southern Metropolis Daily*, 2013). Among 2013 work emphases printed by the State Council office, pilot projects promoting food safety responsibility compulsory insurance system are specified. During such process, Japanese institution of verifying goods damage compensation system –SG symbolizing institution is also worth learning (Zuo Junde, 2001). Such institution provides that as long as consumers use SG labeled products, in case of life or property damages they can obtain compensations, 0.1 billion yens at most (equivalent to about RMB 7 million-noted by the author). The dealer should pay certain amount of verification expenses and buy insurance in insurance companies; and the damages will be paid by insurance companies in the aftermath of incidents. Such institution guarantees that consumers are compensated after the incident, and compared with the legislation compensation procedure it's faster and more effective, so it plays a better role in practice.

(IV) Tendency of Law Amending

In China's existing *Food Safety Law*, there are 15 provisions in chapters of legal responsibilities, the first 10 articles is about the supervisory punitive responsibilities of violators of food safety law imposed by relevant administrative organs. Comparatively speaking, there is only one article about the provision of civil liability in the end of this chapter.

In consideration of above analyses, I think that the civil compensation liabilities should be further strengthened in the modification of *Food Safety Law*. Based on this, it can follow the legislative mode of *Product Responsibility Law*, divide the damages and administrative punishment, and regulate production operators' liability for damage; or even if it's combined into the chapter of legal responsibility, the civil liability should be in the first step, specific infringement and responsibility for breach of contract articles should be further improved.

Targeted at the infringement responsibility, it should be further completed on the basis of Article 96 of *Food Safety Law*, and statement on damage identification method, compensation subject, compensation scope and situations of exemption from liabilities should be provided. For example, “in terms of victims' personal injury, the offender should compensate the medical expenses, nursing expenses during treatment, cost of lost labor, etc.; those causing the victim disability should pay expenses such as self-help tool expenses, life subsidies, disability damages and necessary living

1 In 1992, the 79-year-old old woman Berkley was burnt by a Macdonald hot coffee worth of 49 cents, and finally the court judged that the coffee has the quality defect and decided that Macdonald should pay the punitive compensation of USD 2.7 million. After released, the classical case of punitive compensation deters all society, and has effectively enhanced relevant industrial food quality self-discipline standard.

2 “If one customer buys the steam stuffed bun and encounters the food safety accident, the punitive compensation will be RMB 100 at most if nine times larger than the product price, and won't deter law breakers. However, the minimum compensation can just handle such illegal circumstances. Therefore, the standard of the minimum compensation is preliminarily established to RMB 1000 to RMB 2000 (China Economic Herald, 2013).

expenses of the family supported by him; those causing victim death should pay funeral expenses, death damages, and necessary living expenses of the family supported by him before his death. If the defect of product causes losses in property of the victims, the party shall be responsible for restoring or compensating for it.

At the meantime, articles regarding the responsibility for breach of contract should be added to the *Food Safety Law*. With a reference to provisions of Article 111 in *Contract Law* and Article 40 in *Product Responsibility Law*, products with quality failing to comply with agreement (failing to meet the standard marked in food package, failing to meet the quality condition indicated by description and samples, etc.) should be replaced, returned and compensated.

In addition, in order to realize the operability of compensation system, the food safety responsibility compulsory insurance system and actual payment by damages can be taken into account.

II. Establish Administrative Supervisory Responsibility System: Administrative Violation, Compensation And Accountability.

(I) Role Change of Administration in Food Safety

As described above, through the completion of food safety civil liability system, consumers can investigate production and operation enterprises' legal responsibility by means of individual or group legislation, and gain damages through liabilities for violation or infringement. However, because the civil liability is established on the basis of actual damages, so compared with existing damage, the damages only make people feel "it's too late". What is more, the damages obtained through individual legislation are not economic to individuals, and it'll consume more social resources and cannot prevent the occurrence of other food safety affairs. Therefore, the administrative sector begins to play a more efficient supervisory role "from compensation to safety" on the basis of former supervisory and prevention function.

In the modern society administrative roles begin to change. With the aggravated modernization process, while the development of modern social technologies brings about numerous advanced production technologies, it also brings various threats such as herbicide residue, chemical additives, compound and transgenesis, but such threats never occurred in ages of food self-sufficiency (Kinsey, J.D., 2001). The food industry is confronted with new challenges posed by risks (Zhao Peng, 2011). The Germany scholar Becker points in *Risk Society* that the existence of humans in modern society are facing various risks produced by the society, and those right holders manufacture risks in contemporary society, and then transform manufactured risks into some "risks", so such practice is "organized irresponsibility".¹ That is to say, according to modern country concept, the relationship of citizens' and national rights and obligations is redefined. The country is not only "necessarily evil" but also "necessarily kind". The administrative care of citizens' life, the prevention of public hazards, and the supervisory management of food safety on this basis are no longer considered a moral obligation but a legal responsibility.

On the basis of this concept, after the occurrence of food safety affairs, if the administrative organ in food safety field fails to perform supervisory behaviors, it'll be considered illegal. But according to the tenet of administration according to laws, when the non-action of the administrative organ negligent in performing duties breaches the law, it must assume corresponding liabilities. At the meantime, cases in practice have also verified the necessity of administrative legal responsibility. After the "melamine" incident lit by Sanlu Milk Powder in 2007, responsible enterprises craftily escape from civil compensation procedures through bankruptcy proceedings, so victims have no way to claim for compensation. People begin to realize that in case of civil liability omission or escape after the food safety incident, it's no doubt that the state finance will provide good guarantee as a backup force (Zhu Xinli, 2001; Du Yifang, 2009).

(II) The Possibility of Food Safety Administrative Liability for Compensation

As mentioned above, the necessity of administrative organs shouldering the supplementary liability for food safety is beyond any doubt. But the key point of the above issue is that if the administrative compensation system of food safety is feasible? Although Article 41.3 in *Constitution* provides that "those suffering from loss because state organs and state working personnel violate citizens' rights are entitled to claim for compensation in accordance with legal provisions," which has provided the constitutional basis for the food safety administrative responsibility, but Article 95 of existing *Food Safety Law* only provides public servants' administrative accountability, and fails to stipulate any provision for administrative organs' administrative legal responsibility.

With a view to the limitation of treasury resources, the law provides that not all citizens' rights will be compensated by the treasury after damaged

¹ Risk refers to the possibility of certain specific harm happening or certain behavior causing specific danger within the specified time, and informally it refers to one uncertainty, the combination of the possibility of certain dangerous situation happens and its consequences. Risk society theories, see Ulrich-Beck, 2004: *Risk Society*, Yilin Press; Cass R. Sunstein, 2005: *Risk and Reasons-Safety, Law and the Environment*, China University of Political Science and Law Press.

and ordinary citizens must meet the condition for obtaining administrative damages. So in the administrative supervision of food safety, when consumers' rights are violated, is it possible to require administrative organs to shoulder the administrative liability for damage? Starting from theoretical level, the following two conditions must be met if administrative organs shoulder relevant administrative legal responsibility for food safety.

It's able to identify administrative act as illegal. Article 6 in existing *Food Safety Law* provides that "health administration, agriculture administration, quality supervision, industrial and commercial administrative management, food and drug supervision and management departments above county level must strengthen the communication, cooperate closely, divide labor according to duties, exercise rights according to laws, and shoulder responsibilities. At the meantime, Chapter VIII in *Food Safety Law* has provided clear regulations on the administrative rights of food supervision departments, and has provided the legislative possibility for administrative organs violating legal obligations. However, in accordance with general theories of administrative laws, provisions of above "articles and general standards without fixed content (Unger, 1994)" are granted with the administrative jurisdiction in spite of huge discretion space. However, according to administrative discretion, administrative organs have the right to select the most appropriate legal effect according to the specific case situation (Yang Jianshun, 2004; Zhou Youyong, 2007). According to such logistics, administrative organs can completely deny that its regulation neglect behaviors in food safety affairs belong to misuse of authority, neglect of duty and thus escape from administrative legal liability on discretion ground. But in fact, the food field has its particularity. In consideration of the importance of life right and health right in food safety field, in order to effectively restrict the administrative right, the scholars are inclined to use administrative discretion reduction theory to withstand discretion when judging administrative behaviors (Li Jianliang, 2002).¹In food safety field, it's generally considered that although the administrative organ can enforce discretion on the exercise of supervisory authority limit, if such authority limit violates citizens' health right, the administrative authority limit will be restricted (Shimoyama Eiji, 1978). That is to say, when risks harming the national life, body and health are generated, if the result can be easily prevented as long as administrative organs exercise the supervisory authority limit or the result cannot be avoided without the exercise of the supervisory authority limit, the administrative organs should exercise the supervisory authority limit; otherwise, it'll be judged to be illegal (Wang Guisong, 2007; Hu Jianmiao, Du Yifang, 2010).

Victims have standing to sue. After the occurrence of food safety affairs, the identification of administrative organs' illegal acts doesn't mean that the victim has the right to file a administration suit against the administrative organ, and requires it to shoulder the legal responsibility. Because in accordance with provisions of Article 12 in *Interpretation of Several Problems about the Supreme People's Court Implementing Administrative Procedure Law of the People's Republic Of China*, the plaintiff filing the administrative suit must have a stake in the complained administrative behavior according to laws. That is to say, after the occurrence of food safety affairs, the victim must prove its stake in the complained administrative behavior before filing the administrative suit. In fact, Article 1 in existing *Food Safety Law* provides that "in order to guarantee the food safety, guarantee health and life safety of the public body, this law is hereby formulated" and has reserved the perfect space for the general public to sue the administrative organ. Because in accordance with "protection specification" theories, as long as "effective legal provisions (where administrative legal obligations originate) is not only for the public interests but also ---or at least--- for citizens' personal interests, it should confirm the subjective rights (Hartmut · Maurer, 2000)". In other words, when the guarantee of public body health and life safety is regarded as the legislation objective of *Food Safety Law*, the safe food provided for the public is not only the guarantee of public interests and social orders, but also should ensure each citizens' life and health safety (Shimoyama Eiji, 1978). When citizen's body or life is damaged because of food safety, of course it has a stake in the administrative organ's behaviors, and naturally he can file administrative suit.

To sum up, in spite of numerous difficulties, the theoretical exploration of completing the food safety administrative responsibility system has never ceased. The continental law system has carefully mastered the characteristics of food and food administration, and has reserved the space for the legislation of China's existing *Food Safety Law*, and has made the administrative liability for food safety possible.

(III) Tendency of Law Amending

On April 18 of this year, the State Council promulgated the *Guiding Opinions of the State Council on Reforming and Improving the System of Supervision and Administration over Food and Drugs by Local Authorities*. The above regulation has clearly pointed out the disadvantages in existing food supervisory, overlapping responsibilities for food supervision, supervision blank and coexistence, the difficulty in fully implementing responsibilities, the difficult centralization of scattered resource configuration, and the low administrative efficiency. After one month, in the executive meeting of the State Council in May, the premier of the State Council Li Keqiang clearly proposed to establish the strictest food safety

¹ The primary feature of administrative discretion is the "openness" of legal effect and "the authorization of case decision-making power", so the so-called "discretion shrink" refers that the above openness and individual case deciding space vanish partly or completely, namely, under the special circumstance, the administrative discretionary space granted by legislators may shrink. "The circumstance of the administrative discretion only having sole legal determining possibility is generally called "discretion decreases to zero". See Li Jianliang, 2002: "Discussion on the Shrink of Administrative Discretion", "New Theory of Modern Public Law",

supervisory system (Chinanews, 2013). In view of the current situation and current legislation basis of China's food administrative supervision, taking the opportunity of establishing the strictest food safety supervisory system, I think that administrative laws of food safety should be included into legislation during the modification of Food Safety Law. Only complete and feasible legal system of administrative responsibility is established, the aim "to cage the power" can be realized, so as to implement the food safety supervisory system.

Specifically speaking, the administrative responsibility article is added before the accountability clause in Article 95 of the existing *Food Safety Law*: in the violation of this regulation, county-level and above local people's government, health administration, agriculture administration, quality supervision, commercial and industrial administrative management, food and drug supervisory management department or other relevant administrative departments which fails to perform the duty specified by this law or causing life, property and other damages due to misuse of authority, neglect of duty and favouritism should assume administrative liability for damage.

At the meantime, although it doesn't belong to the concept category of administrative responsibility, the administrative accountability system needs to be completed in construing the food safety supervisory responsibility system. Article 95 of the existing *Food Safety Law* has provided administrative sanctions for working personnel in administrative organs failing to perform the duty specified by the law, misusing authority, neglecting duty or playing favouritism in food safety supervision, such as demerits, demotion, decapitation or dismissal etc.. However, the article doesn't involve key elements such as the person to hold accountable and investigation procedures, so after the occurrence of food safety affairs, due to a lack of corresponding institution, system and mechanism as the support, the accountability mechanism only emphasizes the form and is difficult to implement effectively in spite of the storm effect. Therefore, it's also necessary to clearly provide the specific accountability subject, authority limit, responsibility level of accountability object, accountability standard and scope, and accountability procedures and system, and let the food safety accountability get rid of "sport storm" and step toward the "normal state".

III. Define the Criminal Accountability System: Link Administration and Execution

Except that certain administrative punishments should be imposed by administrative organs for the illegal act of food safety, the criminal liability for severe circumstances constituting a crime should be investigated in accordance with criminal laws. In terms of the necessity and possibility of food safety criminal laws, relevant theories are quite mature, so I will not talk about it (Zhang Yajun, 2012; Liu Renwen, 2012). But the implementation of 2011 *Criminal Law Amendment (VIII)* has provided the legislative basis for the food safety punitive practices to a great degree. However, it's obvious that in terms of illegal acts in the food safety field, besides criminal penalty, administrative penalty in the public law field is more common. The two and the civil liability in private law field have constituted the responsibility system of food production and operation enterprises.¹ Only when the food safety administrative penalty system is linked with the criminal sanction system, the illegal criminal acts can be effectively contained and the misuse of laws can be prevented. However, it's a pity that no matter in theory or in practice, there are few discussions on food safety administrative penalties and criminal penalties.²

Articles involving relevant provisions on the criminal penalties for food safety in the existing *Criminal Law* are Article 143 "crime for producing and selling food failing to meet health standards" and Article 144 "crime for producing and selling poisonous and harmful food".³ However, articles with provisions on the administrative penalties in *Food Safety Law* are Article 84 to Article 94. The only criminal penalty article in *Food Safety Law* is Article 98 "the criminal liability of those in violation of this provision and constitute a crime should be investigated". To some degree, the simple provision can realize the objective of introducing the food safety illegal act from *Food Safety Law* to *Criminal Law*. However, it has the same problem shared by all simple legislations that the too ambiguous provision fails to establish the boundary between administrative penalty and criminal penalty, so it makes the implementation of food safety responsibility difficult. Specifically speaking, Article 84-94 in *Food Safety Law* provides that illegal production and operation acts such as "the added food additives", "herbicide residue", "nutritional ingredients failing to comply with food safety standards", "going bad" will be imposed with administrative penalties, but in fact all above acts own the behavioral element of "crime for producing and selling food failing to meet hygienic standards" specified in Article 143 in *Criminal Law* or specifically speaking it's the materialization of the latter. Thus will both overlap?

In accordance with criminal law theories, one of criminal elements is that the illegal act must result in serious social hazards and constitute the crime.

1 It needs to note that Clause 2 of Article 408 of Criminal Law provides that "the crime due to misuse of authority and dereliction of duty in the food safety supervision" is actually connected with the accountability system of working personnel in administrative organs in Article 95 of Food Safety Law, and doesn't belong to the relationship of administrative penalty and criminal penalty discussed in this section, so it won't be discussed.

2 For the discussion on the relationship of administrative penalty and criminal penalty, see Zhang Jiansheng, 2011: Responsibility for Violating Administrative Legal Obligations: Between Administrative Penalty and Criminal Penalty, *Administrative Law Review*, No.2.

3 Article 144 in *Criminal Law*: Whoever mixes the foods that he produces or sells with toxic or harmful non-food raw materials or knowingly sells such foods shall be sentenced to fixed-term imprisonment of not more than five years or criminal detention and shall also, or shall only, be fined not less than half but not more than two times the amount of earnings from sales; if an incident of serious food poisoning or any serious disease caused by food-borne bacteria has resulted, thus seriously harming human health, he shall be sentenced to fixed-term imprisonment of not less than five years but not more than 10 years and shall also be fined not less than half but not more than two times the amount of earnings from sales; if death is caused to another person or especially serious harm is done to human health, he shall be punished according to the provisions in Article 141 of this Law.

But compared with the administrative penalty, whether the hazard reaches certain severity should be judged from “harmed legal interest” and “illegal way of act”. Therefore, the leading authority of criminal law Prof. Chen Xingliang proposes that “the seriousness of the case, amount, and consequence” constitute the decisive element of distinguishing two systems, and the above standard has become popular in criminal law field (Chen Xingliang, 1992). If the above standard is applied to the food safety field, it can be found that compared with Article 84-94 in *Food Safety Law*, Article 143 of *Criminal Law* also adopts expressions of “enough to cause serious food poisoning incident or other severe foodborne diseases” and “doing serious harm to body health”. Obviously, the above article adopts the standard “consequence seriousness” as the critical point of administrative penalty and criminal penalty. Through law interpretation, we may think that once production and operation enterprises produce and sell food failing to meet hygienic standards, relevant administrative organs may impose administrative penalty; but not all acts in violation of *Food Safety Law* will violate the criminal law, and only when the illegal act produces certain harmful consequences, can the criminal penalty be imposed. However, this problem is not solved. In terms of what are “serious food poisoning incident or other serious foodborne diseases” or “what situations do severe harm to bodily health”, *Criminal Law*, *Food Safety Law* and the *Implementation Regulation of Food Safety Law* provide no specific statement, so they still need to be further stated by judicial interpretation or guiding court cases.¹

I think that in spite of existence necessity, specific provisions on the measurement of penalty in *Food Safety Law* are not practical. Thus, it’s better to take the opportunity of law amendment and implement relevant judicial interpretations, quantize terms such as “severe incident” “severe harm” in Article 143 of *Criminal Law*, which will be a more convenient and effective way. After all, as different supervisory methods, the criminal and administrative penalties have their own advantages, so they cannot be arbitrarily replaced. In the face of severe food safety situation, under the concept of “governance by heavy penalties”, we should be more vigilant of the extreme situation of replacing administrative penalty by criminal penalty.

IV. Conclusions

In terms of the legal norm logic, the significance of the legal responsibility is to make the law operable and effective. Without legal responsibility, the legal fact is just a moral rule only with behavioral pattern but without concrete consequence, let alone the practicality and efficiency of the law (Cane, 2008). Of course, in the food safety field, the real significance of sound legal responsibility system is far from this. Health and life are first in any social context, let alone in the traditional culture of China, “food is the paramount necessity of the people”, so the food safety is a key issue involving people’s livelihood, government credibility and even social stability. By completing the food safety legal responsibility, it not only provides the remedy for harms, but also educates and alerts other social members; in addition, it can prevent and resist the occurrence of food safety affairs from the source.

To complete the food safety legal responsibility is to establish the operable and comprehensive legal responsibility system for food safety. We should take civil liability as the primary responsibility, set up the concept of the first person responsible, add articles on self-regulation and responsibility for breach of contract; meanwhile, we should build the food safety insurance system, make the compensation for damages produce real effect; adopt the liability for administrative compensation as the supplement in case of a lack of civil liability, realize the combination of administrative and victims’ right guarantee according to law, and further specify administrative accountability system and procedures; as the severest criminal responsibility, we should conform to criminal provisions and realize the linkage of criminal liability and administrative penalty by specifying relevant concepts by law. In a word, only with the labor division of civil, administrative and criminal liabilities, and the resultant force of mutual cooperation, can the occurrence of food safety affairs be greatly reduced to “convoy” the tongue safety.

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Establish General Food Safety Legislation Responsibility System: Suggestion For the Amendment of the Legislation Responsibility in Food Safety Law

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Abstract: Since low cost has been the important reason of the food safety crisis event, the establishment of general food safety legislation responsibility system became very important. Let companies become the first responsibility, and set civil liability as the first step in food safety responsibility. Improve tort liability clause, adding breach of contract responsibility clause, establish controllable compensation mechanism, introduce administrative compensation responsibility mechanism, define concrete procedure and system of current administrative accountability, and according to judicial interpretation, to realize the linkage of penalty responsibility and administrative punishment.

Key Words: Food Safety; Legal Liability; the First Responsibility of Company; Administrative Compensation

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Drug Regulation Fee Regime and its Reform in China¹

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Abstract: At present, the level of drug regulation fee in China is too low to provide cost compensation for drug regulation activities and improve the regulation efficiency through regulation fee. For private articles, public goods and quasi-public articles, it is applicable to provide regulations through price, tax and fee regimes, and administrative regulation is provided for quasi-public articles to a great extent. The design of regulation fee shall be based on the fair, efficient and legal principle. It is feasible to introduce drug regulation fee regime in China from perspectives of the nature of drug regulation activities, the position of drug regulation mechanisms, and the purpose of benefiting the beneficiaries, improving drug examination and approval performance and realizing drug regulation objectives. Therefore, it shall legally set drug regulation fee, confirm the range and standard of drug regulation fee, perfect the forms and adjustment procedures of drug regulation fee, define the use of regulation fee, revise the legal rules and impel the development and reform of drug regulation fee regime in China.

Keywords: Drug Regulation; Regulation Fee; Administrative Fee; Administrative Law

I. Introduction

Administrative regulation fee is a widely applied method for the government to raise fund, and is an important means to perform administrative management and compensate the employed social resources when providing public services to the public. Government regulation of the drug field can guarantee healthy rights and interests of the public by guaranteeing safety, efficiency and controlled quality of drugs, and the regulation department can provide market admittance qualification to applicants through activities of issuing permits and providing certifications to make applicants able to obtain corresponding commercial profits. Therefore, according to the cost compensation principle, awarding principle and efficiency principle, it is somewhat reasonable to charge fees equivalent to the service costs or management costs from the applicants.

Overseas, the drug regulation fee are not only an important fund resource of the drug regulation mechanism, and as an important policy instrument, they also have important significance in guaranteeing the safety and efficiency of drugs, improving the performance of drug evaluation, shortening the time limit of drug evaluation, and promoting the development of pharmaceutical industry. For this purpose, the paper will hackle the current situation of the drug regulation fee regime in China, and will present suggestions for the development and perfection thereof through the evaluation of administrative regulation fee theory and in combination with the practical situation of drug regulations in China.

Researches of Chinese law experts on administrative fee regime pay more attention to the forms and procedures, caring about taking what legal hierarchies to set administrative fees and what procedures of administrative fees are (Wang Chengdong, Ge Bowei and Man Xuehui, 2002; Wang Kewen, 2004). However, what is the difference between the fee and the tax, and what is the range of administrative regulation fee? During the realization process of government regulation and public governance objectives, what functions do the government fees play? For these more substantiated problems, the law experts have few researches (Jiang Lihong, 2012).

At present, China has tentatively introduced administrative regulation fee regime in power, stock, bank and insurance regulation fields. However, so far, the regime design of administrative regulation fee and the idea of “user fees” in administrative regulation of the economic experts and management experts are only limited to the very preliminary review, and seldom combine researches of actual fields in China (State Electricity Regulatory Commission, Ministry of Finance of the People’s Republic of China, the World Bank, 2007).

The research intention of the paper aims not only to promote the reform of drug regulation fee regime in China, but also tries to think about if there is any possibility to introduce the idea and regime of “User Fee” in the government regulation field in China, and think about what are the set subject, range, purpose, standard and adjustment procedure of regulation fee. The paper tries to deepen the understanding of administrative regulation fee regime of Chinese scholars through researches of specific fields.

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II. China's current drug regulation fee regime

The operation of regulation mechanism shall be premised on the condition that the regulation funds are fully guaranteed. When the beneficiaries of administrative regulation are non-specific majority of people and related to specific benefits or services, the financial appropriation shall be taken as their main fund resources. When services or goods provided by the administrative mechanism have confirmative benefits and confirmative beneficiaries, the beneficiaries shall pay corresponding consideration for services or goods obtained by them (G. Duff, David, 2004). This contains the principle of “User Fee” in administrative regulation, which means the administrative organ will charge certain fees from specific beneficiaries for specific goods or specific services provided by the administrative organ.

At present, China seldom discusses the setting and reform of the administrative fee regime from the point of “User Fee”. According to Clause 1 of Article 47 in *Pricing Law of the People's Republic of China*, “State administrative organs shall collect fees strictly according to law, limit fee collection items and scope and standards of fee collection”. In practice, the setting of administrative fee in China generally has two types: one is to set fees by means of express provisions by laws, regulations and rules etc., and the other one is to set fees by normative documents under regulations. As laws and administrative regulations, Article 41 of the *Drug Administration Law of the People's Republic of China* (hereinafter referred to as *Drug Administration Law*) and Article 62 of the Regulations for Implementation of the Drug Administration Law of the People's Republic of China (hereinafter referred to as *Regulations for Implementation of the Drug Administration Law*) have addressed principled statements to drug regulation fee. These two principled articles have definitely specified that the charging standard will be formulated or checked and ratified by the financial department of the State Council jointly with the competent price department of the State Council. In practice, the items and standards of drug regulation fee are usually reviewed and approved by the national financial department and the national competent price department after being applied by the national drug supervision and administration department. This is the most common setting mode of regulation fee applied in China at present.

The current drug regulation fee in China mainly include drug examination and approval fee, drug authentication fee, drug inspection fee and variety protection fee of traditional Chinese medicine:

(I) Drug registration fees

Such fee was passed on the 4th Session of Standing Committee of the 10th National People's Congress on August 27, 2003 according to the *Administrative Permission Law of the People's Republic of China*, and implemented on July 1, 2004. Clause 1 of Article 58 stated that the administrative organs shall not charge any fees for implementing administrative permits, but if the laws and administrative regulations have other provisions, they shall be abided by. It was passed on the 7th Session of Standing Committee of the 5th National People's Congress on September 20, 1984 according to the current Regulations for Implementation of the Drug Administration Law of the People's Republic of China, revised on the 20th Session of Standing Committee of the 9th National People's Congress on February 28, 2001, and implemented on December 1, 2001. Article 62 stated that fees can be charged for those drugs registered according to Pharmaceutical Administration Law and provisions of such law. The *Drug Registration Regulation* was published in the No.28 Decree of the State Food and Drug Administration on August 10, 2007 and was implemented on October 1, 2007. Article 3 contains drug registration application as “new drug application, generic drug application, imported drug application and its supplement application and re-registration application”.

The drug registration fees generally involve review and approval fees, daily management fees and fees for license issuing and changing etc.. According to provisions of *Notice of Changing the Affiliation of Charge Items of New Drug Examination and Approval Fees etc.* [CZZI (1999) No. 5] issued by the Ministry of Finance and the State Development Planning Commission on Jan. 27, 1999, changes of the new drug examination and approval fee, imported drug registration and approval fee, registration fee for import and export license of narcotic drugs, registration fee for import and export license of psychotropic drugs and registration fee for import and export license of special drugs shall be charged by the State Food and Drug Administration, and the charging standard shall be subject to standards specified in calculated price [1995] No.340. At present, the drug examination and approval fee is insufficient to reflect the cost of drug evaluation activities, and the charging standard is relatively low. Items and standards of drug examination and approval fees at present are shown in Table 1.

(II) Drug certification fees

According to provisions of Article 2 of *Regulations of the People's Republic of China on Certification and Accreditation*, certification means a qualified assessment activity in which the products, services and management systems are proved by the certification authority as complying with relevant technical specifications, mandatory requirements or standard of such technical specifications. The significance of certification is to require providers of products or services to meet certain standards or conditions, thus to guarantee that the consumers of products or services can understand

corresponding information and knowledge. The certification involves the process of determining the certification standards and applying them to individual certified ones (Kinney, Eleanor D., 1994).

Articles 9 and 16 of *Drug Administration Law of the People's Republic of China* have specified regimes of certification of *Good Manufacturing Practice for Drugs* (GMP) and certification of *Good Supply Practice for Pharmaceutical Products* (GSP), and specified that the drug supervision and administration department shall certify whether the drug manufacturing enterprises comply with the *Good Manufacturing Practice for Drugs* and the *Good Supply Practice for Pharmaceutical Products*. Certification shall be issued to qualified new drugs.

Notice of Certification Charging standard for Quality Management Specifications of Drug Production and Management and Associated Problems (FG Price [2004] No.59) issued by the National Development and Reform Commission and the Ministry of Finance in January 2004 specifies the application acceptance fee, review fee and their standard in the certification of *Good Manufacturing Practice for Drugs*. Besides, it specifies that the drug certification and management organs of each province, autonomous region and municipality can charge GSP certification fees from pharmaceutical trading enterprises within the area under administration, and the charging standard shall be formulated by the component price department and financial department of the province, or autonomous region or municipality where the enterprise is located, and shall be reported to the National Development and Reform Commission and the Ministry of Finance for file. GSP charging standards of each place are also related to the overall condition of the local economic development and to the structure and scale of the pharmaceutical industry.

Table 1 Fee Items, Standards, Basis, Serial Numbers, and Organizations of Current Drug Registration (Yuan)

No.	Charge items	Charging Standards(Yuan)	Basis of fees	Payee
HTK]	STBZ]			
I	Approval fee of new drugs		Total Price [1995] No. 340	
1	New drug clinical research, anthroposcopy preliminary examination fee	Classes I, II and III, RMB 2500; Class IV and V, RMB 2000		Local authority
2	New drug clinical research reexamination fee	Classes I, II, III RMB 3,500		National bureau
3	Preliminary examination fee for new drug production	Classes I and II, RMB 4300; Classes III, IV and V, RMB 3500		Local authority
4	Reexamination fee for new drug production	Classes I and II, RMB25000; Classes III and IV, RMB 20000; Class V, RMB 10000.		National bureau
5	Generic approval, technology transfer preliminary examination fee	1500		Local authority
6	Generic approval, technology transfer reexamination fee	1500		National bureau
7	Approval fee of trial production conversion	10000		National bureau
8	Approval fee on add specification of domestic drugs	20% of the corresponding item		Local agency, the national bureau
II.	Imported drugs approval fee		Total Price [1995] No. 340	
1	Imported drug registration approval fee	45300		National bureau
2	Approval fee of one-time imported drugs	2000		National bureau
III.	Special drug licensing fees		Total Price [1995] No. 340	
1	Narcotic drugs import and export licenses	150		National bureau

Continued Table 1

No.	Charge items	Charging Standards(Yuan)	Basis of fees	Payee
2	Psychotropic drugs import and export licenses	150		National bureau
IV.	Drug registration fee		Total Price [1995] No. 340	
1	Varieties recorded in <i>China Pharmacopeia</i> and in standards issued by the national drug supervision and administration department that are applied to produce	500		Provincial bureau
2	Drugs and hospital preparations that have been produced	50		Provincial bureau

Table 2 Fee Items, Standards, Basis, Serial Numbers, Organizations of Current GMP Certification and GSP Certification (Yuan)

No.	Charge items	Charging Standards(Yuan)	Basis of fees	Payee	Remarks
I	Goods Manufacturing Practice for Pharmaceutical Products(GMP)		FG price [2004] No. 59		
	Application fee	500		State Drug Administration	
		Less than 500		Provincial Drug Administration	
	Audit fees	30000		State Drug Administration	Each variety added means RMB 3000 increased.
		Less than 30000		Provincial Drug Administration	
II	Goods Sales Practice for Pharmaceutical Products(GSP)	Provincial authorities and financial sectors formulate the price.	FG price [2004] No. 59	Provincial Drug Administration	

(III) Drug inspection fees

Article 6 of the *Drug Administration Law* specifies that drug inspection institutions set or determined by the drug supervision and administration department are responsible for legally implementing drug inspection. As the technical support to guarantee safety and effectively and controlled quality of drugs, drug inspection is at pillar position of technical supervision. Through registration inspection and supervision inspection, it bears the responsibility of providing scientific and fair inspection data for technical evaluation and approval, administrative regulation and administrative punishment of drugs etc. (State Food and Drug Administration, 2009).

According to provisions of Article 41 of the *Drug Administration Law*, for biological products specified by drug supervision and administration departments of the State Council, drugs sold for the first time in China and other drugs specified by the State Council, before they are sold or imported, they shall be inspected by drug evaluation organs specified by drug supervision and administration departments of the State Council, and the inspection can be charged.

According to provisions of Article 62 of *Regulations for Implementation of the Drug Administration Law*, fees can be charged for drug examination and approval inspection and inspection within the range specified in Article 41 of the *Drug Administration Law*. As investigated from the point of scientific principle, the examination and approval inspection and so on are inspections aiming to determine whether to approve the drug registration. For applicants, this means it is possible to get specific profits on the market after obtaining the registration application; therefore, it is legitimate to set examination and approval inspection fees.

Besides, according to provisions of Article 61 of the *Regulations for Implementation of the Drug Administration Law*, snap check of drugs shall not be charged. Snap check of drugs is a part of drug regulation and is an important link of post-regulation of drugs, and the funds are more suitable to be guaranteed by the finance.

In the attachments of *Notice of the National Development and Reform Commission and the Ministry of Finance on Adjustment the Drug Inspection Charging Standard and Related Matters* (FG price[2003]No.213), corresponding drug inspection charging standards are issued and single inspection

expenses of 562 items are specified.

(IV) TCM protection fee

The State Council issued the *Regulations on the Protection of Types of Traditional Chinese Medicine* in 1992, which was published on the No.106 Decree of the State Council of the People's Republic of China on October 14, 1992, and became effective on January 1, 1993, trying to improve the quality of traditional Chinese medicines, protect the legal interests of manufacturing enterprises of traditional Chinese medicines and promote the development of traditional Chinese medicine business by protecting the traditional knowledge in traditional Chinese medicine varieties.

According to provisions of *Notice of State Price Control Bureau and Ministry of Finance on Protection and Evaluation Fees of Traditional Chinese Medicine* (JFZI [1993] No.178) issued on April 23, 1993, enterprises applying for protection of types of traditional Chinese medicine shall pay protection, review and evaluation fees for types of traditional Chinese medicine to the examination and approval committee for protection of types of traditional Chinese medicine. At present, protection fees of types of traditional Chinese medicine mainly include preliminary evaluation fee, re-evaluation fee, annual fee for type protection, assessment fees for quality of the same type and evaluation fee for export.

Table 3 Fee Items, Standards, Basis, Serial Numbers, and Organizations of Current Drug Registration (Yuan)

No.	Charge items	Charging standards(Yuan)	Basis of fees	Payee
1	Regulations on the Protection of Types of Traditional Chinese Medicine		JFZI [1993] No. 178	
1	Preliminary examination fee	7000		Provincial bureau
2	Reexamination fee	15000		National bureau
3	Annual fee to protect species	50% of reexamination fee		National bureau
4	Quality assessment fee of the same variety	Not exceeding 20000		National bureau
5	Export examination fee	100		National bureau

(V) Summary

The setting basis of the current drug regulation fee regime in China comes from provisions of laws and administrative regulations. At present, the level of drug regulation fee regime in China is too low to reflect the cost of regulation activities of drug evaluation, drug certification and drug inspection etc. and provide cost compensation for these activities. At present, the purpose of drug regulation fee is not clear and cannot reflect the original intention of expanding the guarantee of drug regulation resources and funds, improving the efficiency of drug regulation and increasing the quality of drug regulation service through regulation fee.

III. General theory of the administrative regulative charging system

When designing the administrative regulation fee regime, the fee compensation mechanism of certain article or service is closely related to the consumption feature of such article. Except that the operating services can utilize the price mechanism, those providing government services mainly is tax or fee.

(I) Goods consumption characteristics and classification

In public economics, classification can be made according to the exclusiveness and competitiveness of the article. The so-called exclusiveness of articles means the use or consumption of these articles can be prohibited, on the contrary, articles that cannot prohibit others to consume or the avoid cost of which is too high technically do not have the feature of exclusiveness. The competitiveness of articles means the use of certain article by somebody will reduce the use of this article by other people, when the consumers of such article increase marginally, its cost will not change, and such article belongs to noncompetitive articles (Asian Development Bank and the Research Group of Office for Economic Restructuring of the Original State Council, 2004).

According to exclusiveness and competitiveness, articles or services can be divided into two types: those of the first type are private articles having both exclusiveness and competitiveness. Most consumption goods sold on market belong to private articles. Those of the second type are public articles having neither exclusiveness nor competitiveness. When providing certain public article, it cannot exclude the use of such public article by anyone, and meanwhile, the use by anyone will not reduce the use by other people (Clayton P.Gillette, Thomas D.Hopkins, 1987). Those of the third type are articles between pure public articles and private articles, these articles may have competitiveness of consumption but no exclusiveness, or

have exclusiveness of consumption but no competitiveness, or only have limited exclusiveness and limited competitiveness. Usually, articles of such type are called club articles or quasi-public articles. In terms of provision of club articles or quasi-public articles by the government, it is more applicable to introduce corresponding administrative regulation fee regime.

(II) Supply and cost compensation modes of drugs of different types

As investigated from the point of public economics, articles can be divided into private articles, public articles and quasi-public articles according to the competitiveness and exclusiveness owned by the articles. For articles with different features, different supply modes and cost compensation modes are always adopted (Zhu Xiaochuan, 2012).

1. Private articles

Private articles refer to articles having competitiveness and exclusiveness in consumption, for example, refrigerator and washing machine etc.. Private articles are easier to divide technically and are easier to form definite property right, which lays a foundation for effective market transactions. Private articles have the feature of complete restrained effectiveness, which makes the price mechanism become the optimal mechanism to provide balanced output stimulations. The most notable characteristics of price mechanism are paid, free and fluctuant.

2. Public articles

Public articles have non-excludability and non-competitiveness and lack the basis of market exchange, which is the typical market failure field. The price mechanism is difficult to play the role under strains of consumers' "free riding" behaviors; as a result, it is more suitable to take mandatory tax revenue collection to realize the output level required by the society. Specially, the public articles relate to the configuration of public resources, and the public resource configuration is not based on the payment will or payment capability of the counterpart but is more based on the rights, demands or values, therefore, it is not suitable to provide public articles in form of fees (G.Duff, David, 2004). For example, the education field in China is a system based on financial appropriation.¹

The provision of public articles generally adopts the mode of public financial guarantee and uses tax system to compensate the provision costs of the public articles. Tax is a form of obtaining finance revenue for providing public services by the government representing the public. Different from the price system, tax is free, mandatory and fixed, and it is a mandatory service performed by the government in exercising the administrative power. Taxes benefit the public through public articles and public services provided by the government, or to say, the tax payer benefits from the public services and obtains general compensation.

3. Quasi-public articles

The so-called quasi-public articles refer to articles having competitiveness but no exclusiveness, or having exclusiveness but no competitiveness, or articles only having limited exclusiveness and limited competitiveness, such as expressway, grasslands, bridge, and so on (Zhao Quanhou, 2007). Generally speaking, articles having the "public" feature are not always "pure" public articles. The administrative organs will also make specific beneficiaries obtain specific benefits during the process of providing quasi-public services.

The reason why the administrative regulation has legitimacy is that it is trying to overcome monopoly, natural monopoly, information shortage, external shortage and market monopoly etc., suppress predatory pricing and unfair competition, standardize the configuration of scarce resources and promote coordination of the administrative regulation (Anthony I.Ogus, 2008; Baldwin, R., Cave, M. and Lodge M., 2012). However, as a service provided by the government, administrative regulation can make specific beneficiaries get benefits besides protecting the public profits and guaranteeing the public welfare. For example, in drug registration evaluation, drug safety can be maintained by means of prior permits, at the same time, medicine enterprises obtaining the permission have the possibility to gather further commercial profits on the market.

As the public service provided by the government, the administrative regulation can benefit the public and specific beneficiaries at the same time. This makes administrative regulation have the features of quasi-public articles in the regulation field including drug evaluation etc.. Now, the cost for providing such regulation service shall be up to the tax and the "user" fee at the same time (Zhu Xiaochuan, 2012).

(III) Administrative supervision fee system design principles

The design of administrative regulation fee shall be based on three important principles, that is, principle of justice, principle of efficiency and principle of legality.

1. Principle of justice

In the regime design of administrative regulation, the most important is the allocation justice or fairness problems in the design. One main basis for

¹ Clause 1 in Article 53 The State practices a system wherein government appropriations constitute the main body of the educational appropriations, supplemented by funds raised from a variety of other sources, and the State gradually increases its educational input so as to ensure a stable source of educational appropriations for State-run schools.

judging whether some regulation fee is fair lies in that if its setting meets the principle of justice. Such principle thinks that people shall pay according to the profits obtained from the government service, that is, “those who benefit bear the fee” or “how much you are benefited, how much you bear”, and this reflects the direct benefit as well as the proportionality between benefit and burden. Many permission, certification and inspection activities in drug regulation make the regulated ones obtain corresponding qualification or approval to take part in corresponding activities, therefore, charging corresponding fees from the regulated ones comply with the principle of justice.

Another method of judging whether the regulation fee setting is fair is the ability-to-pay principle. Such principle thinks, it shall charge taxes from the one according to the burden that he can bear. The ability-to-pay principle leads to two fairness concepts, that is, vertical fairness and horizontal fairness. The vertical fairness thinks people with big ability shall bear more tax burdens; while the horizontal fairness thinks, people with similar payment capability shall bear the same burden. These two concepts have certain operability and get wider application.

2. Principle of efficiency

The principle of efficiency means the setting and collection of regulation fee must be efficient. The principle of efficiency includes the economic efficiency of regulation fee structure as well as the efficiency of regulation fee collection process. In order to minimize the additional burden and maximize the additional profit of fees, the setting of regulation fee shall make the society pay the minimum price as far as possible to obtain maximum income with the minimum cost.

Between the principles of fairness and efficiency, there is often a conflict. In drug regulation, a considerable part of regulation cost is fixed cost and has nothing to do with scales of drug enterprises. Therefore, according to the attribution rule, all enterprises shall bear the same burden, but such arrangement does not consider the payment capability of the enterprise; but if taking the fairness factors into consideration, letting enterprises with weak payment capability bear less regulation cost burdens violates the principle of efficiency. In the actual regulation fee design, the final fee structure is always the result based on the dual consideration of fairness and efficiency.

3. Principle of legality

The third principle of regulation fee design is the principle of legality. The collection of regulation fee shall be subject to items and ranges specified by laws. The setting of structure and level of regulation fee shall comply with certain program requirements and introduce the participation of interested parties. The financial management of regulation fee collection departments shall comply with relevant provisions and shall have strict audit and supervision.

IV. The possibilities of reform of Chinese drug regulation fee system

(I) The nature of the activities of drug regulation and drug regulation fee

“Drugs, poisonous”, or to say, “Drug is like the two faces of a knife”. As there is high information asymmetry between drug enterprises and drug consumers and the drug consumers are incapable of obtaining complete information about drug profit and risk, it makes drug enterprises likely to provide false or misleading information and provide unsafe or unnecessary drugs to consumers (Katz, 2007).

Therefore, there exists “market failure” in the drug field, which brings risks to drug consumers. To resolve “market failure” of the drug field, it cannot be only limited to the post relief of civil legal obligation and criminal legal obligation and cannot only rely on the tort law, the criminal law and the law on protection of the rights and interests of consumers, as well as product quality law. Drug regulation based on risk analysis shall be carried out to realize the target of drug regulation and guarantee the safety and validity of drugs by combining the “command – control regulation” and the incentive regulation, and by combining the government regulation and industrial automaticity regulation and enterprises’ self-management (Song Hualin, 2012).

From the modern regulation theory, main profits brought by drug regulation are: from the point of subjects of the drug market, the drug regulation can reduce uncertainties in drug production and relevant activities that operators take part in, and is helpful for them to form stable expectation of future activities; from the point of consumers, the drug regulation systematically aims at guaranteeing consumers to obtain more drug information and services, reduce health risks due to drugs and maintain health rights and interests of consumers (Yu Hui, 1997).

In addition, drug regulation forms a kind of quasi-public articles having exclusiveness of different degrees, similar to but different from public articles. On one hand, the drug regulation activities have non-competitiveness, that is, any market related person gets the regulation service itself and will not affect other market participants to get regulation services; on the other hand, the drug regulation activities have local exclusiveness, that is, people excluded from links of research and development, production and operation etc. of drugs generally cannot get the possible profits brought about by corresponding activities. Therefore, the drug regulation activities may be deemed as quasi-public articles or quasi-public services.

As a part of quasi-public services, the drug regulation shall be more scientific, professional, independent, transparent and accountable. The higher

endowment the drug regulatory agencies have, the more multivariate the regulatory governance grid, the easier the regulation autonomy can be realized, and the better the performance of corresponding drug regulation policy is (Hu Yinglian, 2012). Autonomy of the drug regulatory agencies includes financial autonomy. Data between 2002 and 2007 show that financial appropriation occupies more than 80% in the fund sources of the drug regulatory agencies, and more than 50% in the fund sources of public institutions of the drug regulation system all along (Hu Yinglian, 2012). This shows that, the financial autonomy of Chinese drug regulatory agencies is weak, which restricts the independence of the regulatory agencies and even restricts the development of necessary drug regulation activities.

The drug regulation activities also have costs and also require raising corresponding fund sources. Under the background that the financial funds cannot completely guarantee the drug regulation activities, when the drug regulation activities have confirmable profits and confirmable beneficiaries, the setting of drug regulation fee in fair and efficient way is helpful to reflect the spirit “those who benefit bear the fee”, making the funds of regulatory agencies are not restricted relatively by the financial budget. It has stronger institutional autonomy and institutional endowment and can realize regulation targets by more sufficient regulation resources.

(II) The status of drug regulatory agencies and drug regulation fee

In developed countries, the heart of government is traditionally composed of administrative departments and implements the system of minister in charge, and its activities are finally responsible for the Congress or the president. Specified government regulatory agencies are deemed as “leaderless fourth department” and are characterized in independence and accountability. By letting the regulatory agencies independent from politics and separate property from other comprehensive policy formulation departments, they can guarantee high specialization on decision making and exercise the regulatory rights justly and objectively (Ma Yingjuan, 2007).

For regulatory agencies, the stability and sustainability of finance are of great importance. The appropriation provided by the government to drug regulatory agencies is generally lower than the actual costs required for fulfilling the regulatory functions, therefore, it shall make necessary supplement with regulation fee. Every country charges certain regulation fee for drug permission, production, inspection and certification etc.. In theory, regulation fee is a form of distinguishing the regulatory agencies and the traditional administrative departments; it will not disturb the budget arrangement of the country and is good for guaranteeing the independence of the regulatory agencies.

The fund sources of drug regulatory agencies in all countries are generally divided into three types: the first type completely depends on the budget appropriation of the government, but such type of drug regulatory agencies is very rare, only existing in minority countries of Cyprus, Tunisia, Venezuela and Zimbabwe etc.; the second type completely depends on regulation fee, such as England, Australia and Netherlands and so on; and the third type depends on the financial budget appropriation on one hand, and on the other hand, takes regulation fee as an important supplement for budgets, for example, America etc.. The third mode is a relatively common mode (Ratanwijitrasin, S., Wondemagegnehu, E., 2002).

Drug regulation fee constitutes important fund sources of drug regulatory agencies. To prevent influencing the regulation performance of regulatory agencies due to the budget and fund pressure, it can strengthen the independence of regulatory agencies by means of charging regulation fee or annual fees from the regulated persons as important parts of fund sources of regulatory agencies, thus to increase the regulatory capability.

For example, in drug registration field, when it comes to permission tasks of drug clinical trial, new drug application, generic drug examination and approval, imported drug examination and approval, over the counter declaration, supplement application, drug re-registration etc., the work load of drug evaluation departments will be increasing. At present, as the technical evaluation agency for drug registration and management and as the public institution of full-amount financial appropriation, the Center for Drug Evaluation of State Food and Drug Administration is awarded with financial appropriation in the fund of “grant from the state” by the State Ministry of Finance every year based on the financial plan, and the financial appropriation is a sole fund source of basic expenditure and project expenditure of the Center for Drug Evaluation. The human resource, information system and intellectual resource of the Center for Drug Evaluation cannot adapt to the increasing demand of applications. By contrast, countries or areas like America and EU etc. take regulation fee as an important source of task funds for drug evaluation work, and this constitutes important supplement for financial appropriation.

From the point of guaranteeing the independence and specialization of drug regulatory agencies and guaranteeing the drug regulatory agencies have sufficient resources to fulfill drug regulatory functions, it may try to realize the regulation targets of guaranteeing drugs safety, efficiency and controlled quality by introducing the drug regulation fee regime to properly increase the drug regulation fee level.

(III) Drug regulation fee and beneficiaries benefit

Under modern economic conditions, tax is a main part of financial revenue, and is characterized in universal, free, mandatory features. Tax is not based on profit but reflects the judgment of representative agencies to tax payers based on democracy. Free taxes are more suitable to produce and provide articles with common benefits, but it does not investigate how the specific benefit of every person is.

For quasi-public articles like regulation services, the method of regulation fee is conducive to realizing fairness and increasing efficiency. As regulation fee reflects the directness of benefits and the symmetry of profits and burdens. This is an effective encouragement to the beneficiaries, and others do not need to pay additional burdens for this.

1. Discussions on “confirmative benefits” and “confirmative beneficiaries”

As investigated from scientific laws, regulation fee shall be premised on the existence of “confirmative benefits” and “confirmative beneficiaries”. For example, in America, the *Independent Office Appropriation Act* issued in 1952 presents that, when any federal administrative regulation agency provides work, services, reports, documents, profits, special rights or goods of equivalent values to any one including group, association, organization, company or enterprise, the administrative regulatory agency shall furthest realize self-sustaining of funds (Note, 1980). Interpretations of such Act also thinks, only when the activities of regulation agencies bring about direct profits to specific objects, can specific objects be charged for User Fee.

In the case of the National Cable Television Association complaining America in 1974 in America, the court decision thought, what the federal communications commission considers about charging was the overall budget of the commission, not the private profits obtained by the regulated persons, so, the court judged the regulation fee of the federal communications commission illegal.¹ In the case of the Federal Power Commission complaining New England in 1974, the court decision thought, the relevant fees were premised on the private profits obtained by the regulated persons from regulation, but the regulation fee shall be specific fees for specific individuals or companies, and for specific services. However, in this case, it was inappropriate that the fees were based on the cost of the Federal Power Commission to regulate the whole industry.²

However, sometimes, it is very difficult to determine whether the activities of regulatory agencies aim to benefit the public of society or aim to award profits to specific beneficiaries. In the case of Carvel complaining Seattle in America in 1995, the three-level standard³ for judging the justification of the administrative regulation fee was established: (1) its main purpose is to gather money and realize desirable public welfare, or the main purpose is to regulate; (2) whether the gathered money is only used for approved purposes; (3) whether the charged fees have direct relevance with the services obtained by the fee payers (D. Spitzer, Hugh, 2002/2003).

2. China's drug regulation fee and beneficiaries' benefit

Centering on drug regulation fee problems, there are also similar disputes. There is a view that the drug regulation aims to maintain the public health welfare, not to profit specific beneficiaries, and therefore, it shall guarantee the fund of drug regulation in the form of financial budgets. However, it cannot explain that some regulation matter fails to bring about specific benefits to specific groups as it brings about profits to the public.

In terms of drug regulations in China, drug evaluation is indeed the prior guarantee to insure the safety and validity of drugs, it is helpful to protect the health rights and interests as well as safety of the public, and promote the public to obtain innovative drugs. But for specific applicants, early obtaining of drug permission will make them take the first chance to get comparative advantage and obtain specific profits. The permission and regulation of new drugs form the lifeline of enterprise of specific drugs, and the marketing approval system of drugs with excellent design, perfect system and efficient operation constitute the assistor for development of the pharmaceutical industry.

Similarly, the drug production permit, drug operation permit systems constitute access barriers for carrying out drug production and operation, and specific regulated persons that have obtained drug production permits and drug operation licenses will have the chance to take part in corresponding drug production and operation activities.

In terms of legal drug inspection activities, the drug inspection results are used to distinguish true and false drugs and constitute important basis for drug regulation, management and law enforcement. Fighting activities against fake and shoddy behaviors carried out accordingly are helpful to standardize activities of the drug market, enable law-abiding regulated persons to get better market environment and enable their production and sales to be safe from violations of fake and shoddy drugs. This makes the regulated persons obtain specific profits.

Therefore, the drug regulation activities are not only beneficiary to the public welfare, but also can enable law-abiding regulated persons to get the possibility of taking part in activities with commercial values on the market through activities of permission, inspection and certification etc.. Besides, the drug regulation activities will exclude the incompetent ones from the market activities, and makes the regulated persons obtain better and fairer institutional environment, thus making them become stronger and obtain specific profits on the market.

So, the drug regulation is also a kind of regulation service provided to specific market subjects and has features of quasi-public articles. As a result, charging for regulation from market subjects as beneficiaries has corresponding legalization basis.

1 National Cable Television Association v. United States, 415 U.S. 336 (1974).

2 Federal Power Commission v. New England Power Co. et al., 415 U.S. 345 (1974).

3 Covell v. City of Seattle, 127 Wash. 2d 874 (1995).

(IV) Relation between Drug regulation fee and Improvement of Drug Evaluation Performance

1. U.S. drug regulation fee and drug review

In America, the introduction of drug regulation fee regime is also due to the phenomenon of “Time Lag” of new drug application at that time, and the public thought that the drug evaluation was too slow and made the American public fail to enjoy due health services and drug treatment; the industrial circle thought that the drug evaluation was too slow and made drug research and development cost become higher and higher. Besides, the time lapse makes the patent terms of innovative drugs pass by and makes the potential advantages of innovative drugs reduce day by day with respect to generic drugs (Kronquist, Amanda R., 2011).

Under such background, America issued the *Prescription Drug User Fee Act* (PDUFA for short) (I) in 1992, which specified that the charged regulation fees shall be used for evaluation of human medical products. During such period, the Food and Drug Administration of America (hereinafter referred to as FDA) used these fees to increase personnel employment and update information technology infrastructures for new drug evaluations. The number of personnel in the Center for Drug Evaluation and Research (CDER), the Center for Biologics Evaluation and Research (CBER), Office of Regulatory Affairs (ORA) and Office of the Secretary (OC) of FDA was increased from 1277 in 1992 to 1990 in 1997, by 56%. The average drug evaluation time of FDA was reduced to 15 months in 1997 from 30 months in 1992 (Olson, Mark K., 2002).

America issued the *Prescription Drug User Fee Act* (PDUFA for short) (II) in 1997, which specified that the regulatory agency must “evaluate clinical research timely and effectively, and adopt appropriate activities to promote public health”. The Prescription Drug User Fee Act (III) and (IV) issued in 2002 and 2007 respectively by America all stuck to the similar access. The average evaluation time for preferentially examined drugs by FDA was reduced to 6 months of the financial year of 2006 from 13.2 months of the financial year of 1993, and the average evaluation time for normally examined drugs was reduced to 10.3 months of the financial year of 2006 from 22.1 months of the financial year of 1993.

2. China improves the possibility of drug evaluation by drug regulation fee

As a “sunrise industry”, the pharmaceutical industry occupies an important position in the national economy, and by the end of 2012, the pharmaceutical industry of China had 6625 enterprises in total with the total assets of RMB 1640.8 billion, and had completed a production value of RMB1825.5 billion in 2012. In China, drug evaluation is also an important public service function of the drug regulation department, and through the innovation of evaluation policy, the shortening of evaluation time and the improvement of evaluation quality, it will be helpful to standardize drug research and development orders, increase drug research and development levels, promote drug innovation and guide healthy development of the pharmaceutical industry.

It shall improve the implementation of drug evaluation work to enable patients to early use new drugs that can cure Aids, cancer and rare diseases and have obvious clinical treatment advantages, and new drugs that can cure diseases with no effective treatment means, promote the accessibility and availability of drugs and maintain the healthy rights and interests of patients through legal innovation, institutional innovation and regime innovation of drug evaluations.

In China, drug registration and evaluation is a legal function of the drug management department, and Chapter 5 of the *Drug Administration Law* has specified the drug registration system. As drug evaluation is a matter with high technicality, professionalism, heavy task and strong policy, even drug regulation administrators having professional background are difficult to have comprehensive assurance of technical essentials of data of the applicants, and therefore, it is particularly important to establish technical support system for drug evaluation.

At present, as a public institution directly under the State Food and Drug Administration, the Center for Drug Evaluation of the State Food and Drug Administration has about 120 people authorized. It is a technical evaluation institution for drug registration of the State Food and Drug Administration and provides technical support for drug registration. However, there are many pharmaceutical enterprises in China and the quantity of applications for drug registration is big, while the number of evaluation personnel in the Center for Drug Evaluation is small, as a result, the contradiction between the human resource for drug evaluation and the evaluation task is increasingly prominent. If the evaluation resources cannot be guaranteed and the drug evaluation personnel are in overload working state for long time, it certainly will affect the evaluation quality and evaluation efficiency, cannot adapt to the development trend of the current pharmaceutical industry, and affect the accessibility of pharmaceutical industry innovation and public drugs.

Therefore, it can properly improve the standard of drug evaluation fee, establish the relationship among the charging standard, charging level and evaluation task, and apply the evaluation fee directionally to improve the human resource of drug evaluation by means of finding out the gaps of resources and funds in drug evaluation.. This firstly can make the drug evaluation institution increase size of personnel force, provide more competitive treatment for personnel and attract personnel with richer experience, knowledge and qualification to join in the drug evaluation team, thus to enable the drug evaluation team to be competent for drug evaluation work with increasing complexity and risk. Table 4 Evaluation task and

personnel condition of all countries in 2007 America CDER EU EMEA China CDE Evaluation task (piece) 653025986569 Evaluation personnel number (person) 1400119113 Average task (piece/person· year) 4,721.858

Secondly, the American *Prescription Drug User Fee Act* specifies that the drug regulation fee can be used for information construction of drug evaluation. China is also focusing on the establishment of information platform for internal organization and management of the drug technical evaluation to integrate and standardize information produced during the evaluation process and then process and construct to data warehouse to provide reference information for evaluation decision-making, thus to increase the evaluation quality and efficiency and meet the external demand on drug evaluation information (Fan Yi, 2009). The informationization degree of drug evaluation in China can be further increased by properly increasing the drug regulation fee.

Thirdly, as a highly professional field with science and technology oriented, the drug evaluation not only needs to have professional knowledge background of pharmacy, medicine, chemistry and biology etc. and full-time staff with rich evaluation experience, but also needs to rely heavily on external experts paying higher attention to specific fields and having richer knowledge experience and deeper academic research. The current drug registration evaluation in China still lacks a relatively fixed, scientific and fair expert team with strong professional background and high academic status to be as evaluation support. It is helpful to supplement the gap in funds of the evaluation department by the drug regulation fee regime, and it is helpful to make the first-class talents provide scientific consultation suggestions for drug evaluations by employing experts with higher knowledge and more responsibilities from outside.

Fourthly, at present, charging standards for new drug examination and approval fee and imported drug examination and approval fee in China are still retain at the level determined in the documents issued by the State Development Planning Commission and the Ministry of Finance in 1995, and the drug evaluation fee cannot reflect the actual cost of the evaluation task and has no direct relation with the daily funds of the drug evaluation departments. The drug evaluation charging regime urgently needs to be reformed. It shall add the relevance between evaluation charging and evaluation cost, specify the purpose of evaluation fee and use it to the recruitment of examination resources and the improvement of evaluation performance.

To sum up, activities of properly increasing and reasonably confirming the drug examination and approval charging standards, as well as applying such fees to drug evaluation of drug regulation department, perfection of the drug evaluation information system and employment of experts from outside will be beneficial to the improvement of drug evaluation performance. The evaluation fees will not influence the fairness of the evaluation work, as the evaluation fee will follow the pre-determined, consistent and indiscriminate charging standards, it will neither be partial to drugs of specific type nor be partial to enterprises of specific scale. If the evaluation fund is sufficient, it will be helpful to the construction of human resources of the drug evaluation team, and by increasing the quantity of evaluation personnel, improving the specialization degree of evaluation personnel and better introducing management resources of external experts, it can effectively shorten the drug evaluation time and improve the drug evaluation quality.

(V) Drug regulation fee and drug regulatory goals

The drug regulation aims to guarantee the safety, efficiency and controlled quality thereof and promote the accessibility and reasonable use of drugs. The drug regulation fee not only include the drug evaluation fee, but also include drug production and operation license fee, drug inspection fee, drug authentication fee and variety protection fee of traditional Chinese medicine etc.. If effective regime can be established between regulation fee and regulatory expenditure and the fees can be used for regulations of specific drugs, it will be beneficial to the increase of drug regulation capability, the stability of drug regulation team, the improvement of knowledge structure of drug regulation personnel and the construction of drug regulation infrastructure system, besides, it can better fulfill the drug regulation functions to guarantee the realization of drug regulation targets.

V. Promote system reform of China's drug regulation fee

To sum up, it shall, based on the in-depth understanding of the administrative regulation fee theory, properly integrate the existing drug regulation fee regimes of China, legally set the regime of drug regulation fee, determined the range of drug regulation fee, properly improve the standard of drug regulation fee, perfect the forming and adjustment procedures of drug regulation fee, and specify the purpose of drug regulation fee. The drug regulation fee regime is established by introducing the concept of "User Fee" to promote rationalization of Chinese drug regulation fee and strengthen autonomy of Chinese drug regulation institution, enable them to better realize multiple administrative tasks of guaranteeing drug safety and promoting drug accessibility etc..

(I) Drug regulation fee set by law

From theories retained from laws in the administrative law, when administration encroaches rights and freedoms of the public or inflicts obligation

burdens to the public, there should be legal basis. But for fees collected from specific objects for specific matters, the fees are also burdens inflicted to the regulated persons, so it should be subject to legal provisions. In drug codes or specialized drug fee laws of countries of America, Germany and Australia etc., there are specific provisions on drug regulation fee regimes.

The Clause 1, Article 47 of The *Pricing Law of the People's Republic of China* stipulates that "State administrative organs shall collect fees strictly according to law, limit fee collection items and scope and standards of fee collection. Article 41 of the *Drug Administration Law* of the People's Republic of China and Article 62 of the *Regulations for Implementation of the Drug Administration Law* of the People's Republic of China in force in China have specified the charging regime in drug regulation, but fail to realize the internal relevance between charging and regulation.

During the modification process of the future *Drug Administration Law*, special clauses shall be set as far as possible for provisions on the drug regulation fee regime, specifying the fee range, charging standard, forming procedures of charging standard, fee reduction and absolution and charging purpose. Besides, the drug supervision and administration departments of the State Council shall establish coordination mechanism to coordinate with the National Development and Reform Commission and the Ministry of Finance, thus they can jointly issue normative documents to further define the form and adjustment procedures of drug regulation fee standard, explain the calculation method of drug regulation activity costs and state rules and principles a certain specific regulation fee standard shall abide by. Through the establishment and refinement of legal rules, it can promote the development and reform of the drug regulation fee regime of China.

(II) Stipulate the range of drug regulation fee

In the world, drug charges in different countries vary. Generally speaking, fees are charged for regulation matters with stronger professionalism and technicality and requiring more human resources and cost consumption, which are mainly reflected in matters of drug permission, production and operation permission and drug authentication etc.. Countries have different provisions on drug inspection fees, some requires such fees to be fully paid by the government, and some specifies the drug inspection fees.

According to the practical situation of China, activities of drug registration, drug authentication, drug production and operation permission as well as drug inspection etc. require for certain cost expenditures and are premises enabling specific regulated persons to take part in corresponding activities and obtain economic profits, so these fee items shall be included into the range of drug regulation fee. The charged fees include drug evaluation fee, drug authentication fee, drug production permission fee, drug operation permission fee, drug inspection fee and variety protection fee of traditional Chinese medicine etc..

(III) Determination of drug regulation fee

1. Drug regulation fee and cost reimbursement principle

In the design of regulation fee, it shall determine the cost of regulation services as far as possible, so that it can perform budget control and cost control and set reasonable regulation fee level based on the cost calculation information. The research report of OECD also thinks that it shall definitely confirm all costs of each service that is suitable for charge, but not matter whether the fees can completely or partially supplement all the cost expenses, it shall make clear all costs of each service. If the fee cannot supplement the cost completely, it shall define the subsidy degree of such service by the government; the full costs not only include the direct cost of the service, but also include the cost shared by other activities, as well as the non-cash costs including (for example) depreciation and capital costs (Zhao Quanhou, 2007).

The regulation fee shall reflect the cost compensation principle. If beneficiaries of the regulation service do not pay the fee or the paid money is lower than the cost required by the government regulation service, it will bring about more burdens to the tax payers and result in "cross-subsidies" from other parts of the society. On the contrary, the regulation fee cannot be excessively higher than the cost of regulation activities; otherwise, the fee of beneficiaries may constitute "cross-subsidies" for other regulation activities.

According to provisions of Article 3 of *Provisional Measures for the Administration of Examination and Approval of Administrative Fee-Charging Items* of China, the administrative service fees refer to fees charged from specific service objects by the government agencies, public institutions, and social groups and other organizations acting on behalf of the government based on the cost compensation and non-profit principles and according to provisions of laws, administrative regulations and local regulations as well as programs specified by the State Council during the process of providing specific services to the public and legal persons. This also reflects the cost compensation principle of regulation fee.

At present, the level of drug regulation fee in China is too low to reflect the actual cost of drug inspection, evaluation, permission and authentication and provide timely adjustment according to the change of regulation items, the development of scientific technology and the rise of price level. Therefore, it shall properly increase the charging level for drug inspection, evaluation and authentication in China to reflect the principle of cost compensation and guarantee the drug regulation organizations to recover the costs for taking part in activities of inspection, evaluation and authentication etc..

2. Determination of drug regulation fee standard

Standards of corresponding regulation fee can be determined by investigating the nature, work load, cost and fund gap of activities of drug inspection, evaluation, permission and authentication and calculating the cost of each drug regulation activity. Besides, it can determine the total amount of regulation fee by drawing lessons from experience of extraterritorial drug regulation fee regime and according to fund gaps in drug regulation activities, allocate them into all drug regulation fee, and then calculate the general standard of each drug regulation fee.

3. Different regulations fees are charged for different types of products or enterprises

In countries all over the world, new drug evaluations are generally charged for higher evaluation fees, and generic drug evaluations are charged for lower evaluation fees. New drug evaluation will have more complicated technical requirements. As they face more risk judgment and internal uncertainty and consume more human resources and working loads, higher evaluation fees shall be charged for new drug registration compared with generic drugs, and this more conform to the practical situation of the current pharmaceutical industry structure of China.

In addition, when designing the drug regulation fee regime of China, it can take into considerations of the type, scale and ability to pay of the regulated parties as well as the situation of developed varieties to specify the reduction and exemption of corresponding regulation fee. This embodies the spirit of charge-to-ability, and also reflects that the regulation department uses the fee as the regulation tool to guide structural adjustment of the pharmaceutical industry and promote the policy objective of independent innovation.

For example, the followings can be considered: (1) for innovative drugs, pediatric drugs, rare drugs, gene therapy drugs, somatic cell therapy drugs and tissue engineering drugs etc., application fees can be reduced or exempted; (2) for medium-sized and small enterprises with annual output values or annual sales lower than specific amounts, corresponding regulation fee can be reduced or exempted; (3) the national drug supervision and administration department has the right to reduce or exempt specific regulatory fees for specific regulated persons.

(IV) The formation and adjustment procedures of drug regulation fee standard

In China, the current government regulation fee standards are formulated by the financial department and the component price department of the State Council. In future, when formulating and adjusting drug regulation fee standards, it shall fully listen to opinions of interested parties. When determining specific charging standards, it shall investigate the associated situations, and listen to opinions of interested parties including the regulated enterprises, consumers and relevant departments or organizations by means of forum, discussion meeting and asking for opinions in writing.

Besides, the determination of drug regulation fee standards shall take into consideration of factors in price (overall changes of price indices of city consumer goods and overall changes of basic wage of the last fiscal year etc.), factors in workload (changes of total quantities of drug evaluation, drug inspection and drug authentication etc.) etc.. In America, from 1992, each edition of *Prescription Drug User Fee Act* has the Sunset Clause and the period of validity of each bill is five years, and after expiry, only after they obtain re-approval of the Congress can they continue to be in force. Therefore, the America has issued five editions of *Prescription Drug User Fee Act* successively. At present, many drug regulation standards in China still follow provisions made in 1995 and cannot meet requirements of the time.

In future, maybe it can introduce regular review mechanism of drug regulation fee standards. Specific drug regulation fee standards are formulated by the financial department and the component price department of the State Council and specific period of validity (3-5 years) shall be specified for each fee item. After expiration of period of validity, the drug supervision and administration department shall re-apply to the financial department and the component price department of the State Council for the period of validity.

(V) Stipulate the use of drug regulation fee

In China, some laws have specified specific purposes for specific fee items, for example, Clause 2 of Article 34 of the Law of the People's Republic of China on *Prevention of Environmental Pollution Caused by Solid Waste* specifies that pollution discharge fees shall be used for prevention of environmental pollution and shall not be used for other purposes. Clause 3 of Article 14 of the Law of the Peoples Republic of China on the *Prevention and Control of Atmospheric Pollution* specifies that the collected pollution discharge fees shall be all turned over to the Treasury, they shall be used for prevention of atmospheric pollution only, not for other purposes, and will be legally audited and supervised by the auditing agencies. Clause 2 of Article 24 of the Law of the Peoples Republic of China on the *Prevention and Control of Water Pollution* specifies that the pollution discharge fees shall be used for prevention of pollution and shall not be used for other purposes.

In terms of drug regulation, it aims not only to a pure public article, but also quasi-public articles. Drug regulation is good for safeguard of public health welfare, and meanwhile, enable regulated persons to obtain the qualification to develop themselves and take part in corresponding activities in a good and fair market environment, thus to profit the specific regulated ones.

Therefore, under the guidance of the principle of "public services focusing on financial burdens, and quasi-public services focusing on the finance

and the beneficiaries”, it shall charge regulatory fees for corresponding drug regulation activities and explicitly stipulate the purpose of drug regulation fee, for example, the charged regulatory fees can be stipulated to specially used for regulation items of drug registration, regulation management, emergency, inspection and informatization etc., and shall not be used for other purposes. This will be helpful to reflect the principle of fairness in the regulation fee design and the spirit “those who bear the fee benefit”, which makes the regulated ones encouraged to pay the regulatory fees, contributes to the effective collection of regulatory fees and improves the regulation performance.

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Drug Regulation Fee Regime and its Reform in China

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Abstract: Now the level of drug regulation fee in China is very low, it cannot provide cost reimbursement for drug regulatory activities, cannot improve regulatory performance via fees. It can provide private goods by price mechanism, provide public goods by tax, and provide quasi-public goods by regulation fee. To some extent regulation is quasi-public goods. The design of user fee system should comply with the rationale of fairness, efficiency and legality. To explore the nature of drug regulatory activities and the role of drug regulatory agencies, to find identifiable beneficiaries and identifiable interests, to improve drug review performance, to achieve regulatory goal, it is practical to introduce drug regulation fee system to our country. So we should establish regulation fee regime in laws, to define the scope and standard of regulation fee, improve formation and adjustment procedure in drug regulation fee regime. The usage of fees should be clarified. It also needs to revise related laws and regulations, to accelerate the development and reform of drug regulation fees regime in China.

Key Words: Drug Regulation; Regulation Fee; Administrative Fee; Administrative Law

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From Market Failure to Government Failure¹

——Abroad Literature Survey of Government Quality and Safety Regulation

Li Han

Abstract: It is a consensus in academic world that the risks in quality safety domain generated from asymmetric information conditions shall be governed by governmental regulation. The scholars have studied the social efficiency under the common functions of government quality safety regulation and legal liability regulations and analyzed the domains where government quality safety regulation plays functions and the means. It is generally acknowledged that the government regulation plays a positive function in this domain. However, the study of economists also discovered and analyzed the government failure (regulation failure) generated from overregulation in quality safety domain, and the paradox of insufficient regulation formed on the basis of overregulation. We can learn from the literatures that the quality safety regulation of government is the necessary means to govern the failure in quality safety market regardless of the dual character. It shall eliminate the disadvantages with information regulation, inventive regulation, self-implementary regulation and other methods.

Keywords: Quality Safety; Regulation; Responsibility; Market Failure; Government Failure

I. Introduction

Joseph Stiglitz (2009) wrote that when Upton Sinclair described the terrible sanitary conditions in American slaughter house in his novel *The Jungle*, American people and consumers began to abandon consuming meat products; the packaging industry of American meat products pleaded the government to implement the regulation of food safety and issue permit to recover the confidence of consumers again. Today, America shares fresh air and clean water, and the people enjoy longer life because of environmental regulation. At present, it is hard to image a world without food, safety and environmental regulation, where the bone of contention is whether the regulation is excessive, whether it can obtain desirable effect by lower regulation cost rather than the necessity of regulation (Joseph Stiglitz, 2009).

Under the background of complete information and symmetric information, some scholars studied the problem of quality safety responsibility of manufacturers. Walter Oi (1973) held that if both transaction parties and transaction process on product market are in the state of complete information, the legal responsibility investigation mechanism with strict responsibility can effectively control the occurrence of quality accidents; or provided the consumers enjoy much more capacity in free choice, the guarantee objectives of quality safety can be realized without direct government control. But Victor Goldberg (1973) criticized Oi's analysis, holding that product quality safety is the problem that whether the consumer's information is complete, therefore, it is unauthentic to analyze the problem and reach policy implication under the hypothesis of complete information. He holds that under the circumstance of incomplete information, the deduction of Coase Theorem is untenable regardless of distinct property right, namely, the market shall not reach efficient effect through the negotiation of both transaction parties.

Information asymmetry is one of the important reasons for market failure, and it's also the fundamental reason for quality safety problems. George Akerlof (1970) creatively analyzed the influence of information asymmetry on product quality. His analysis is based on the following three assumed conditions: (1) if the consumers cannot confirm product quality before purchasing; (2) compared to low-quality commodities, the price of high-quality commodities is higher; (3) the manufacture is impossible to guarantee quality. If the three conditions are qualified, market mechanism is hard to play functions on providing quality safety products. In addition to the early studied related to product quality safety responsibility under the environment of complete information, the majority analysis in such field is based on the hypothesis of incomplete information. Though Stiglitz described that the American packaging merchants of meat products place the hope of recovering market on government intervention at the beginning; in the early analysis related to quality safety responsibility of economists, it did not indicate that they acknowledged the necessity of quality safety regulation regardless of information asymmetry in product market. Amidst classic economics, the literatures related to product quality safety

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responsibility hold that government regulation is not an alternative means to solve market operation barrier, while the benefit balance of both parties on market shall be recovered through legal way and remedy (Viscusi & Moore, 1993); or through the guarantee of manufacture on product quality (Spence, 1977); or adopting insurance mechanism (Geistfeld, 1995). All of the above means can realize the market balance of efficiency between producers and consumers without the quality safety regulation of government. Information asymmetry is one of the reasons of market failure, but it is not the sufficient theory of government intervention in market. The information asymmetry in quality safety requires no government safety regulation of government, however, as the investigation of Stiglitz, the regulation within food, drugs and safety domain exists generally worldwide, and the research literatures related to this field are as vast as the open sea. The paper summarizes and concludes the research literatures related to this direction by scholars at home and abroad seeing from the functions and mechanisms related to quality safety responsibility of government.

Besides the introduction, the article is divided into three parts. Section two describes the functions and ranges of government quality safety regulation upon treating market failure; section three introduces the government failure in quality safety regulation domain; the last section is the conclusion and research prospect.

II. Government responsibility for quality safety in market failure

(I) Common use of government quality safety regulation and legal responsibilities

Along with the rising of information economics, the scholars realize that quality safety is a typical risk problem caused by information asymmetry among market transactions. The asymmetric quality safety information will bring external influence on each subject and distort market resource configuration, thus quality safety domain shall be regulated by the government. The literatures related to product quality safety responsibilities discuss the realization of market balance and social welfare under the common functions of government regulation and legal responsibilities. Guido Calabresi (1970) held that the functions of government quality safety regulation and legal responsibility regulation were the same. Steven Shavell (1984) firstly pointed out that the product quality liability system and government regulation shall keep balance during the control process of product quality safety risk. Absolutely, he raised four theoretical foundations when discussing whether choose public power (government regulation) or private law (legal liability) before and after the event: (1) the regulation organization and private department master different product risk information; (2) the manufacturer is impossible to undertake all damages upon quality safety risk; (3) the manufacturer is possible to be free from the responsibility due to various reasons; (4) the cost on managing and investigating manufacturer's responsibility upon government fulfilling the regulation responsibility of quality safety may exist. Based on the above four conditions or assumed premises, Shavell put forward that the solution optimizing social welfare is to find out the joint point between government regulation and legal responsibility. It is the optimal solution to risk control of product quality safety. Rose-Ackerman (1991) defined the scope of government regulation and infringement and legal liability related to quality safety damages by means of legislation. He thought that the former is public law and the latter is private law. The tortuous liability in law and government quality safety legislation regulation are complementary to each other, both are effective. He raised three complementary conditions between each other that the tortuous liability of common law is only an expedient upon uncritical regulation, which are only limited to the domains uninvolved by government regulation legislation. The quality safety regulation shall retreat from the domains controlled by tortuous liability by more rigorous means as far as possible. To sum up, the majority behaviors leading to quality damage shall be controlled by classic tortuous liability in the domain of quality safety. Quality safety regulation shall choose the domains of direct products, beforehand regulated products and seriously harmful products, such as the smaller range of health, car and drug. In these domains, because of the absence of professional knowledge and personnel, the tortuous liability regulation or court system fails to process the quality safety problems of technology products.

Alessandra Arcuri (1999) pointed out that Goran Skogh analyzed the advantages and disadvantages of liability regulation, government regulation, private insurance and public insurance in 1989, therefore the different regulations will be more efficient upon mixed using. At the same time, Arcuri held that whether the quality safety regulation of incomplete information control and regulatory mechanism can be a kind of effective means correcting market failure, the key point is that whether the government can formulate effective regulation of quality safety. One important task of regulation policy maker is to communicate with consumers as for the information of quality safety by effective means.

Based on the analysis paradigm of Shavell (1984), many scholars conduct theoretical analysis on welfare effect using government regulation and legal liability mechanism as a whole. Charles Kolstad et al (1990) pointed out that many previous economists held that the beforehand regulation of safety standard and pigovian tax and afterwards measures of tortuous liability can be replaced by each other. They proved that if uncertainty exists, the negligence liability regulation using tortuous law will produce low efficiency, while beforehand regulation can correct the condition. Patrick Schmitz (2000) also held that both are complementary, and it will bring better welfare effect upon mixed use. At the same time, he further pointed out that if the victims of quality safety shares uniform wealth, it can reach the above conclusion without assuming the wrong implementation of

government regulation. Robert Innes (2004) analyzed the different functions of government regulation before the event and legal liability after the event on enterprise liability and reducing the risk of safety accidents using a unified theoretical frame. He held that even though the cost of enterprise fulfilling safety reliability is higher than that of monitoring accidents significantly, direct government regulation before the event may be more effective than liability regulation after the event. Yolande Hiriart et al (2004) proved that if prevention is not verifiable, it shall consider the problem of incentive mechanism failure brought by moral hazard upon the above analysis. Sebastien Rouillon (2008) theoretically analyzed how government regulation and legal responsibility system act to maximize social welfare, and proved that combined use is superior to single use. Here, the regulation is totally unnecessary to stipulate strictly. The analysis of Bharat Bhole and Jeffrey Wagner (2008) is based on the assumed condition that the enterprise can fulfill quality safety responsibility through the observable and unobservable methods. The combined use of government regulation and strict liability regulation will be more superior when without the proof of judge. The first deduction is still effective when the enterprise faces punitive damages as long as social welfare and reliability cost of enterprise are negatively correlated.

(II) Providing information is the effective path of government quality safety regulation

Arcuri (1999) pointed out that correcting quality safety information regulation of information asymmetry is the preferred policy and measure to guarantee the free choice of consumers. The preferred scheme of correcting market failure caused by incomplete information is providing lacking information without intervening with market directly. For this purpose, Schwartz and Wilde (1979) provided a theoretical analysis, and Viscusi, Magat and Huber(1986) provided some examples of consumers using information effectively in the domain of safety regulation.

As for information of different types, what means shall be provided, when are the information means effective or ineffective, which information means will produce better effect? Nelson (1970) held that the commodities can be divided into search goods and experience goods according to the difference of information asymmetry degree. Darby and Karni (1973) mainly analyzed the example of credence goods. Nelson (1974) pointed out the manufacturer will consciously issue the real information of product quality. The government regulation of quality safety may distort the normal transmission channel of information. At this time, Lemon market failure defined by Akerlof will not appear. Klein and Leffler (1981) hold that the information mechanism raised by Nelson can solve the problems on Lemon market defined by Akerlof.

As for the reputation mechanism model raised by Milgrom and Roberts (1986), reputation plays a function in quality guarantee, and the price can display the additional quality signal. The literatures stress the information disclosure mechanism in quality safety regulation. The regulation shall not confine the disclosure of real information. As for all commodities, fraud of credence goods is the most possible and most serious in damages, so the information regulation will generate best effect in this aspect. Rubin (1990) discovered that reputation mechanism will guarantee the quality of manufacturers who want to keep a foothold and sell repeatedly on market.

Here, quality safety regulation mainly is a kind of effective mechanism transmitting information to consumers. When the consumers are unaware of the risk or uncertain to the possibility of damages, the consumers may underestimate or overestimate the risk, and thus result in inefficiency. This is the perspective put forward by Asch in 1988. Bardach and Kagan (1982) held that if the consumers' information are not all from the bounded rationality of consumers, excessive information disclosure may make the consumers unable to read or digest. At this time, the mandatory disclosure of information may produce negative effect. Pildes and Sunstein (1995) pointed out that the incomplete information of consumers may be supplemented through the improvement of environment, for example, improving education level can strengthen the information processing ability of consumers, etc.

In addition to information regulation, as for quality safety regulation of the government, strengthening the stringency of quality safety regulation, correcting contents of quality or safety involved in advertisement, making compensation, imposing a fine and other remedy measures are also under use. As for the fine imposed on the violation of manufacturers in the aspect of quality safety, Feistein (1990) held that the fine measures of government shall only be used in actual fraud; secondly, the optimal fine shall encourage the manufacturer to make effort in quality safety. Shavell (2005) also discussed direct regulation, corrective tax and legal prohibition (Injunction) for accident liability. However, he acknowledged that the combined use or single use shall be directed against specific conditions. The analysis of Marcel Boyer and Donatella Porrini (2011) indicated that: if the efficiency of judicial system can be improved, it will improve the level of fulfilling responsibility in safety, thus the possibility of accidents will be reduced; at this time, the safety standard and requirement to maximize social welfare will be reduced, and the share of enterprise in responsibility system will also be decreased.

III. Government failure in quality safety regulation

There are many reasons for regulation failure or government failure. George Stigler (1971) raised Regulation Capture Theory once, specifying that as for each industry in social economy, government regulation may be a challenge or an opportunity. "Government regulating market" may exist in

regulation legislation and implementation. Driven by benefit, the regulated subject will by all manner of means conduct "rent seeking" as for regulation organization and attempt to influence and even bribe the regulation lawmaker and law-executor. In addition, there is also special benefit group theory raised by public choice school and other theories. The reasons for government quality safety regulation are the information asymmetry existing between subjects in quality domain and social negative externality brought by quality safety accident. "North Paradox" also told us that "the existence of state is the key point for economic growth, while the state also is the source of man-made economy recession (Douglass North, 1994). The government shall provide just and fair quality safety regulation policy starting from public benefit. The government intervention with market subject may result in failure, generate low regulation efficiency and damage the benefit of producers and consumers. The government overregulation will produce government failure under the condition of market failure. The distorting function of government failure on market configuration resource mechanism equals to or is more serious than market failure.

(I) Over-regulation

It shall introduce the concept of regulation intensity as for the discussion of overregulation in quality safety domain. Regulation intensity has become a general concept under existing environment and in the government regulation research in financial domain. There are many relevant theories and empirical studies and articles at home and abroad. Some scholars have built the theoretical model related to regulation intensity. Many researches pay much attention to empirical research. Regulation intensity refers to the limitations in qualifications, opportunities, conditions and degree when the market subject begins to start business. De Soto(1989), a Peru economist compared the time to be taken to build a small garment factory in Lima and Florida Temple, while the ratio is 289 days vs 2 hours. Afterwards, Zylbersztajn, Graca (2002), Djankov, La Pporta, Lopez-de-Silanes and Shleifer(2002) calculated the accessing regulation intensities of different countries. Especially, the latter evaluated the regulation intensity of 85 countries using the procedure number accessing to regulation, time spending on handling procedure and currency cost of payment.

Western countries tended to be relaxed in regulation in 1970s. Many scholars studied the adverse influence of government overregulation from different domains of environment, safe production, telecom, finance, etc. The expression or measurement of overregulation is various, such as the total number of pages of Dodd-Frank law in 2010 is 848, which is 23 times of Glass-Steagall act. More serious, it requires the regulation maker to fill in more detailed contents at intervals of one page. This reflects "over-regulation." Frederick Sawyer (1979) held that the formulation of government regulation policy in environment domain considers much in political aspect. Many regulations are based on the simple extrapolation of rough research results, ignoring the complexity in ecological process and human society, which may produce opposite relation between industry and government and make the regulations produce more harm than good after implementation. John Mendeloff (1986) analyzed the health standard-setting during the regulation process of Occupational Safety and Health Administration (OSHA). Excessive regulation and insufficient regulation coexist in the process. Overregulation is sourced from using the method with high cost to realize stricter standard. Under-regulation is because many risks are not coped due to the backward process of standard setting. As for many processes of standard setting in OSHA, the two problems exist simultaneously. Moreover, the rigid standard will drag the progress of standard setting. In other words, overregulation leads to under-regulation to some extent. The reasons lie in four aspects: the conflict between trade union and industrial organization will make the standard setting appeal to the court, but standard effect is complex and uncertain regularly, needing regulation organization to prove the necessity of standard, however the resources are limited, etc. According to his calculation, during the OSHA regulation, the cost of 90% regulation polices is too high, indicting that it is unable to save one or two persons while spending several million dollars. Especially the safety standard about Vinyl Chloride, it shall cost 40 million dollars to save one life. In his opinion, only the cost of standard about abstinence is rational, 0.4 million dollars can save one person. He held that the reform direction of OSHA shall enlarge regulation range and reduce strict degree, thus, the social welfare effect of government regulation will be better. It indicates that the given cost of regulated subject in obeying regulation can prevent much more diseases. The changes in strategy will decrease cost and save more life.

Absolutely, the calculation of Mendeloff is from the comparison between cost and benefit only without considering ethic. And that's why Sidney Shapiro and Thomas McGarity (1991) criticized the calculation, who considered there are mistakes in this calculation. It is not too correct if depending on cost estimation in advance. In addition, it is hard to master the complexity when estimating and measuring the benefit caused by health and environmental regulation.

Such literatures at abroad have discussed the incentive and restriction relation between government overregulation and regulated individual. Gary Cacciatore (1997) deducted that American medicine industry is regulated at highest level, which is indicated in the vast regulation measures, it also reflects that the regulation measures determine the service of medicine industry in a detailed way. The results lead to that the professionals pay much attention to how to meet the detailed requirements of government regulation measures, while ignoring the occupational judgment. As for many regulation measures, it is necessary to intervene with the actual operation level of medicine industry, or it will weaken professional spirit. Haring and

Rohlf's (1997) held that American want to take important steps and measures to push forward the competition in telecom industry, while regulations share the majority. In theory, the accessing rate between telecom operators shall be negotiated between enterprises, but it is opposite in fact. The regulation effects on competition are adverse in the industries of aviation, automobile transportation and railway. The industry price will be too high, while the service quality will be decreased steadily; therefore, the government has no choice but to take over some industries. They further put forward that if the telecom market was not regulated excessively, the effect of free competition will be more effective. Curtis and Schulman (2006) held that America medicine regulation influenced the innovation of medical health department and increased cost, resulting in high growth in medical cost, so the patients will face too high cost in medicine. Complex and fussy regulation measures increase the cost and halt the service innovation. Although the objects among above research are in different environment and domains (medicine), the overregulation of government regulation on micro regulated subjects produce negative effect on the action of regulated subject, and even the regulation result may be adverse to the intention of regulation setting.

(II) Paradox of overregulation and underregulation

A Chinese archaism says that “beyond is as wrong as falling short”, it is also in this way in regulation domain. The research on paradox between overregulation and underregulation starts from financial domain. Joshua Aizenman (2009) held that the quiet period before financial crisis will result in the decline in regulation intensity. If the period is longer, the regulation intensity may be decreased to zero, but the regulation level meeting social requirements is positive. If the financial crisis brings higher loss in cost, overregulation may appear. As for the solutions of paradox, it shall adopt the structure of reform regulation, use information disclosure, add the independency of regulation organization in politics, and use the international standard of “Minimum Prudential Regulation” and other methods. Cass Sunstein (1990) held that the paradox is based on Self-Defeating Regulatory Strategies, namely, it is opposite to the results of regulation strategy and design intention. For example, the implementation of Clean Air Act will result in more dirty air. There are a good many of such analysis in the literatures of public choice and welfare economics. The regulation organization will play a meaningless function in serving private benefits based on public assets. Sunstein also stressed that the solution to the regulation paradox is learning from the examples of mechanism failure rather than recovering to the free period.

Just as the example of environment quality said by Sunstein, the researches about overregulation and under-regulation are reflected in American environmental regulation. The researches of Markusen et al. (1993, 1995) discovered that under the functions of different enterprise costs and transportation costs, the local competition between different states will produce two different circumstances, and it will step on different extremes upon the formulation of environmental protection standard. Colin Scott (2012) held that the existing government regulation wants to regulate everything. In Ireland, although the quantity of regulation organizations and regulation range is increased significantly, but the regulation capacity is dissipated. The regulation organizations are fragmented in organization and implementation form, making the rights scattered and weakened, so the responsibilities are aggravated.

IV. Conclusions and prospects

Market failure is the premise of government intervention. However, government intervention may not bring satisfactory results due to various reasons. Firstly, one theoretical analysis is that there is larger error of government regulation in the aspect of premise, process and result. It only depends on the government to correct market failure, but ignores the cost in regulations and possible failure. Secondly, as government action, it is necessary to provide information for expected purpose of regulation. But under normal state, the regulation maker knows less information of regulating subject than regulated subject. The information restriction confines the efficiency of government regulation, and the regulated subject may behave adversely. In addition to these researches, some scholars also pay much attention to the negative influence of government regulation intensity during regulation process. As for the government regulation of quality safety, according to the theory of industry organization theory, in the monopolistic market mechanism, if the monopolistic manufacturer produces experience goods or credence goods, it is necessary to conduct government regulation in order to make up the insufficiency in product quality or difference in quantity. The intensity of regulation policies and means adopted by the government may generate “overregulation” or “under-regulation”. Both conditions may produce the failure in government regulation.

Overregulation may influence the positivity of regulated subject. Under-regulation is not enough to compensate for the damages in consumers caused by market failure. In western countries especially in the domains of economy and finance, the voice to strengthen regulation and relax regulation will be transferred along with the coming and fading of economy and financial crisis. So to speak, the situation of relaxed regulation in economy domain and reinforced regulation in society domain coexist in western countries. Seeing from America, the government intervention with micro-economy has been increasingly strengthened from the end of 18th century. Social regulation has boomed day by day in the aspects of health, safety and

environment since the end of 1960s. The wave of relieving industrial economic regulation in aviation, railway, energy and telecommunication appears in England and France.

In our country, there may be opposite situations. Along with the reform and opening-up policy, after we relieved the regulation in market economy, the relevant standards in market domain are not built fully. It shall need much more regulation means in economic regulation domain. For example, as for the anti-monopoly domain, the anti-monopoly regulations are imperfect in implementation regardless of issuing. However, the environment and safety domains have been attached to planned economic system fundamentally without market-oriented reform. In generally, the domains are in the regulation of high level, so it is necessary to relax regulation rather than strengthen regulation. Cheng Hong and Li Dandan (2009) pointed that the overregulation of government on micro market in quality safety domain will unbalance the mechanism of “incentive-restriction”, thus the regulation will be in failure. Cheng Hong et al. (2012) put forward that American quality control system can avoid the dilemma to a large extent. The government may produce some negative effects in regulation in the fields of safety production and food safety. Dong Zhiqiang et al.(2007) held that the government and enterprise will conspire during the process, and analyzed the mechanism theoretically. Nie Huihua et al. (2011) took advantages of the data of China coalmine production safety accidents to test pool data. Lin Mingang et al. (2008) analyzed the local protectionism and regulation failure during food safety regulation. So to speak, more and more national scholars begin to concern the government failure in national regulation domain in recent years, and they analyzed the phenomena using foreign regulation theories and conducted econometric tests using Chinese data.

Precisely because of the appearance of regulation failure, the scholars put forward several methods to govern regulation failure. Absolutely, these methods are to change government regulation rather than eliminate government regulation, which can change the relation between regulating organization and regulated object during regulation process, and enable the regulated object to face correct incentive mechanism. Laffont and Tirole (1993) created incentive regulation theory, specifying that efficiency and information rent is a pair of commensal contradiction because of information asymmetry. Regulation can prevent the enterprise from monopoly profits at the cost of efficiency loss. So it shall introduce incentive mechanism to government regulation to solve the above problems. In the domain of quality safety regulation with information asymmetry, incentive regulation is an effective means to motivate market subject. In addition, Porter and Kramer (2006) pointed out that self-regulation is a kind of institutional arrangement involving formal and informal regulation, standard and regulation process. The standard and regulation process are mainly formulated by the organization members for the purpose of standardizing their behaviors. It is a kind of intermediate means between government regulation and market regulation, which has unique advantages in market failure, and it can overcome market mechanism failure and deficiency in government regulation to some extent. Different from the mandatory regulation of government, self-regulation is a kind of system designed and implemented by the regulated subject, which is more rigid than government existing regulation, or built in the domain lacking government regulation or standard. Then there is deregulation. Many countries tend to be relaxed in regulation in recent years because the increasingly obvious regulation failure and deepening research on regulation theory. Marjit et al. (2008) held that the environment in high regulation will distort the government information; therefore the regulation shall maintain a minimum level.

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From Market Failure to Government Failure: A Literature Survey on Quality and Safety Regulation

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Abstract: Government involvement is needed to regulate the quality and safety issues under asymmetrical information, which is a common view between scholars. Economists analyze the joint usage of government regulation and responsibility statutes, also, the domain and mode of government regulation are defined. However, those scholars discovered the government failure resulted from overregulation in quality and safety regulation, and theoretical and empirical analysis is given to explain this paradox. Although there are two sides of government's quality and safety regulation, it is still the necessary method to cure the market failure in quality and safety governance. Nonetheless, informational regulation, incentive regulatory policies and self-enforcing regulation are required to overcome its drawbacks.

Key Words: Quality and Safety Responsibility; Regulation; Market Failure; Government Failure

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Analysis of Quality Safety Game on Special Equipment¹

Zhang Jihong

Abstract: The risk issues of special equipment are caused by the information asymmetry of maintenance quality. The game behaviors among each game-agent testing the quality safety of special equipment shall result in different risk behaviors. Taking game theory as the analysis tool, the topic constructs the static game payoff matrix between government and enterprise, and analyzes the effect of different means on special equipment through introducing different situations of fine, consequence punishment, and reward and behavior accountability. The topic also introduces different disturbance variables to generate into different equilibrium solutions through investigating the game mechanism between enterprises. The market-oriented reform on inspection technique organization for special equipment is the most fundamental methods to solve the quality safety risks of special equipment.

Key words: Special Equipment; Quality Safety; Game Analysis

I. Introduction

Special equipment refers to the equipment and facilities involving life safety and having larger danger, such as boiler, pressure container, pressure pipe, elevator, hoisting machinery, recreation facilities, passenger ropeway, motor vehicles within factory, which are the important infrastructures for national economy and people life. As one important part of national public safety, the safety of special equipment concerns the vital interests of the masses and the overall situation of economic development and social harmony and stability. The safety regulation of China special equipment establishes two basic systems during the long-term practice, namely, certification and accreditation as well as supervision and inspection. Regardless of significant achievements, the safety regulation of special equipment reflects the state dominated by government only. Along with the development of socialist market economy, the marginal benefit of safety regulation system for special equipment dominated by government only is minimized constantly, while the negative externality is on the increase. The contradiction and friction between relevant interests bodies are aggravate, exposing a series of problems, which are indicated in multiple management, confusing rights and liabilities, so it is impossible to prevent the risks effectively. These issues require a kind of safety regulation system and mechanism for special equipment suitable for the current social development period.

As for the research of regulation system reform for special equipment, Liang Guangzhi (2002), Zhang Baozhu (2005) and Li Xiaoming (2006) pointed out that when discussing the reform and development of inspection and testing organization for special equipment, under the current management system, the inspection and testing organization tends to deviate from public interest organizations driven by department interests regardless of public institutions. What they put forward is the market-oriented reform of inspection and testing business for special equipment rather than specific methods. They only raised some suggestions in certain aspects, for example, the law shall authorize non-profit organizations to assume the registration and mandatory inspection functions for special equipment. Luo Yun (2005), Zhou Rong (2008), Yang Zhenlin (2008) and Miao Hongliang (2008) comprehensively introduced safety system engineering and risk management theory into safety supervision of special equipment, and comprehensively and systematically studied the significant hazard identification, risk evaluation and risk control according to the principle, procedure and method of safety production risk management. They also designed safety evaluation and indicator system with different focuses, built safety evaluation model, enriched and perfected the evaluation system of safety production, in order to improve the safety regulation efficiency of safety regulation.

As for the relevant studies on quality game, Rubinstein (1982) put forward a basic framework of non-cooperation game in the process of sequential offer. Based on Rubinstein framework, Kessler(2004) et al. studied a price negotiation game failing to verify quality products, constructed the model of moral hazard issues between buyer and seller, and analyzed the relations between transaction configuration efficiency and distribution efficiency. Reynier(1995) et al. put forward a method of supplier providing product quality and manufacturer implementing quality inspection, and studied the contract design and quality control under conflict environment. They thought the game model between supplier and manufacturer is non-zero-sum

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game. The model can recognize that what contract parameter can achieve cooperation solution through game equilibrium. Based on the previous studies, Hsieh et al. (2010) studied the different game equilibrium strategies and inspection profit effect levels of quality investment and inspection strategy under four kinds of information disclosures. Based on the model framework and theory foundation of Kessler and Hsieh, Bi Junxian et al. (2011) designed the quality jurisdiction model and integrity mechanism design method of sampling inspection products. Pu Hongtao and Shi Xiaodong (2011) used game theory to establish the safety management game model for safety supervision organization and production agency of special equipment, and discovered the relation between safety regulation cost, punishment intensity and inspection possibility.

Because the inspection and testing technology of special equipment is very strong, so the phenomenon of information asymmetry is very serious. According to Lemon market theory put forward by Akerlof(1970), the phenomenon also appears in inspection and testing market for special equipment. Amidst the inspection and testing market of special equipment with bounded rationality and information asymmetry, one party masters sufficient rights and wrongs, and the other party is located in the inferior position of information. Driven by benefits, the dominant party will maximize profits, distort and hidden safety information, thus the scale will become bigger and bigger. The quality suppliers with high quality and sufficient inspection will be replaced by that with poor quality and insufficient inspection in the form of “Bad money drives good money”, so the Lemon market of inspecting and testing special equipment is formed, making the opportunistic behavior prevail on inspection and testing market of special equipment. Because the interest bodies pursue to benefits, the game with interest bodies is trapped into “prisoner’s dilemma”, and the safety regulation organization of special equipment deviates from the orbit of public benefit and the risks of safety regulation for special equipment are increased. As the important sign of urbanization, the elevator will be used widely along with the development of economy, so the safety regulation of elevator will become increasingly important in social governance. Because elevator is widely used in daily production and life, it can indicate the dialectical unity of public properties, market properties and social properties compared with other special equipment. Therefore the paper will take elevator as the research subject. Firstly, analyze the current situation of elevator quality safety; prove the Lemon market phenomenon existing in inspection and testing market using game theory; analyze possible issues according to different rewards and punishments, and put forward that the market-oriented reform of inspection market is the basic method to solve the dilemma.

The special organization structures of other sections are shown as follows: section two builds safety game model of special equipment and analyzes the game according to different situations; section three gives the corresponding policies and suggestions according to analysis conclusions.

II. Special equipment safety game analysis

According to *Safety Supervision Regulation for Special Equipment*, the game-agent can be divided into four classifications, which are production unit (including design, manufacture, installation, transformation and maintenance), using unit, inspection and testing unit, supervision and inspection unit. As for China existing management system of special equipment, as the technology support unit of supervision and inspection unit, the inspection and testing organization for special equipment and supervision and inspection unit constitute the administrative regulation unit for special equipment. Therefore, the safety game of special equipment can be divided into the game between government and enterprise, and between enterprises.

The static game model between government and enterprise reflects the game between administrative regulation department and manufacturing enterprise. For example, whether the design unit designs according to standard during design process; whether the supervision department implements regulation; whether the production unit produces according to standard or design; whether the regulation department exercises regulation rights; whether the using unit registers; whether the regulation department intervenes administratively, etc.

Situation 1: at present, because the supervision and inspection management department lacks of supervision and regulation, it indicates that there are no punishment measures on the administrative omission of supervision and inspection unit; as for the using or production enterprises giving a fine to “non-safety production”, the fine shall be returned to administrative regulation unit wholly or proportionally (return to inspection and testing technology unit in fact) as administrative fund. For that reason, it shall build the game payoff matrix between government and enterprise, as shown in table 1.

Table 1 Static payoff matrix between supervision and inspection department and manufacturing enterprise

		Manufacturing enterprise	
		Standard production	Non-standard production
Supervision and inspection departments	Act	-c,r	F-c,R-F
	Act of omission	0,r	0,R

Here, c indicates government cost in regulation (including inspection, information collection and processing, etc.); r refers to the revenue of enterprise upon safety production; R refers to the short-term yield upon non-safety production; F refers to the fine for non-safety production.

If the possibility of “administrative action” is p , the possibility of “administrative omission” is $1-p$; if the possibility of standard production is q , the possibility of “nonstandard production” is $1-q$. Thereout, the expected yield of utility caused by government regulation is:

$$\begin{aligned} E_p &= p \times q \times (-c) + 1 - q \times F - c + 1 - p \times [q \times 0 + (1 - q) \times 0] \\ &= p(F - Fq - c) \end{aligned}$$

In a similar way, the expected yield of utility caused by standard production of manufacturing enterprise is:

$$\begin{aligned} E_q &= q \times p \times r + 1 - p \times r + 1 - q \times p \times R - F + 1 - p \times R \\ &= qr - R + pF + (R - pF) \end{aligned}$$

Under the condition of long-term equilibrium, it can achieve the possibility of “administrative action” of supervision and inspection management department according to the balanced mixed strategy of complete information static equilibrium game.

$$p = \frac{R - r}{F}$$

The probability that production units select "regulate the production" is:

$$q = \frac{F - c}{F}$$

We analyzed the relation among possibility p of “administrative action” of supervision and inspection management department, possibility q of “standard production” of production unit and government punishment intensity F . Accordingly

$$\frac{\partial p}{\partial F} < 0, \quad \frac{\partial q}{\partial F} > 0$$

We can conclude that: the relation between possibility of “administrative action” of supervision and inspection management department and government punishment intensity F is negative; the meaning is that the possibility will minimize along with the increase of government punishment intensity F , such as the increase in fine. However, the relation between possibility of “standard production” of production unit and inspection management department and government punishment intensity F is positive; the meaning is that the possibility will increase along with the increase in government punishment intensity F . If the government punishment intensity F is far larger than the “administrative action” cost of supervision and inspection management department, the possibility of “standard production” of production unit will be near to 1. In return, if government punishment intensity F is as much as cost C of “administrative action” of supervision and inspection management department selecting, the possibility of “standard production” of production unit will be near to 0. Therefore, as for different product units (design, manufacture, installation, transformation and maintenance), the administrative action cost of supervision and inspection management department will be different, and the administrative regulation cost in eight kinds of production units is quite different. In order to ensure “standard production” of manufacturing units for eight kinds of special equipment, the government punishment intensity F shall be specific and meticulous rather than unified punishment intensity.

However, it will discover that when investigating the expected yield function of supervision and inspection management department:

$$\frac{\partial E(p)}{\partial q} < 0$$

It indicates that the expected yield of supervision and inspection management department will minimize when the possibility of “standard production” is in increase. If the supervision and inspection management department is regarded as rational economic man, firstly, submit the fine from regulation organization of special equipment to the competent department of special equipment in fact, and then the competent department will return the fine (F) to regulation organization wholly or proportionally, especially is inspection and testing organization. The assumption is rational basically. The supervision and inspection management department will try every means to stop the increase of q , or decrease q when lacking office fund. That is to say, the supervision and inspection management department is unwilling to see all enterprises choose the strategy of “standard production”, for the purpose of obtaining much more fine F . Because the special equipment is distributed unequally in China, the phenomenon of “watering for fish-farming” appears in the west area with less inspection. As for the east area with more inspections and less inspectors, the inspection and testing technology organization often goes through the motions, processes and issues certificates at random in order to complete inspection tasks per year. The main reason for increase in safety risks of special equipment is that the safety management mechanism can not meet the fast-growing economic development and quantity of special equipment. Therefore, in order to cope with the dilemma, it is necessary to conduct market-oriented reform on safety inspection organization of special equipment.

Situation 2: the existing regulation mechanism is that the Special Equipment Administration appoints a detection technology organization of special equipment to inspect the special equipment per year, but the technology organization belongs to the special equipment administration. The affiliation makes the special equipment administration lack regulation on the subordinate technology organization. The technology organization will overdraw government credit and inspect without standard for the sake of interests appealing. As for the “administrative action” behavior of supervision and inspection management department, it lacks effective supervision, and the accountability takes effect only after significant accidents. The public only criticizes the government management level when there are no significant accidents, so the punishment on regulation department is conditional. When the public knows the production unit is engaged in non-standard production and the supervision and inspection management department takes omission strategy, it is possible to make a dent that “the unit breaks law willfully due to neglect of duty of government”. For example, the case of Hangzhou assembly elevator exposes that the supervision and inspection department acts nothing during each link of industrial chain. Provided the supervision and inspection management department suffers $-s$ loss, it can be interpreted as the punishment from public or the loss of public satisfaction, then the new payoff matrix is shown in table 2:

Table 2: Conditional loss introducing to supervision and inspection management department

		Manufacturing enterprise	
		Standard production	Non-standard production
Supervision and inspection departments	Act	$-c, r$	$F-c, R-F$
	Act of omission	$0, r$	$-s, R$

According to the above matrix, the re-solved expected utility function of supervision and inspection management department is:

$$E_p = p \times q \times (-c) + (1-q) \times F - c + (1-p) \times q \times 0 + (1-q) \times (-s) \\ = pF - Fq - c - sq + s + sq - s$$

And production units expected utility function is:

$$E_q = q \times p \times r + (1-p) \times r + (1-q) \times p \times R - F + (1-p) \times R \\ = qr - R + pF + (R - pF)$$

Under the condition of long-term equilibrium, it can achieve the possibility of “administrative action” of supervision and inspection management department according to the mixed strategy solution of complete information static equilibrium game.

$$p = \frac{R - r}{F}$$

The probability that production units select “regulate the production” is:

$$q = \frac{F + s - c}{F + s}$$

Compared with “situation 1”, after introducing the conditional loss s of supervision and inspection management department, the possibility of “administrative action” by supervision and inspection management department is not changed. It shows that the regulation department pays no attention to the accountability and punishment on in case of accidents; the fluke mind exists in the management department of special equipment generally; therefore, after-event accountability shows no effect on the management quality of regulation department obviously.

The possibility of production unit choosing “standard production” is q , if the numerator and denominator are increased by s respectively, we can achieve that:

$$\frac{F + s - c}{F + s} > \frac{F - c}{F}$$

That is to say, the possibility of production unit choosing “standard production” will increase if s is far higher than punishment intensity F , the possibility of production unit choosing “standard production” is near to 1. In return, if s is small enough or yields no loss to supervision and inspection management department, the increase in possibility of production unit choosing “standard production” will play no function. At present, the economic development is dominant, and the regulation department pays no attention to the evaluation level of public satisfaction, that is to say, the loss will not influence the behavior selection of supervision department, so it will have no effect on the possibility of production unit choosing “standard production” in short term. In order to promote the production unit to increase the possibility of “standard production”, it can take fine as an alternative means when designing the mechanism of considering conditional loss in the supervision and inspection management department. For example, if the public satisfaction evaluation with regulation department is taken as the assessment reference of cadres in special department

administration, it will promote the improvement of special equipment safety effectively

Considering the relation between expected utility E_p of supervision and inspection management department and possibility q of production unit choosing "standard production" the derivation of utility E_p to q is:

$$\frac{\partial E(p)}{\partial q} = s(1-p) - pF$$

When $s > \frac{pF}{1-p}$, the relation is positive. We can know that when the supervision and inspection management department pays much attention to

public evaluation or the after-event fine is serious enough, the expected yield of government will increase along with the increase in possibility. In return, if the supervision and inspection management department pursues high evaluation or prevents suffering from serious fine, the production unit will pursue the high possibility of "standard production".

The after-event punishment on supervision and inspection management department shall be changed into the daily evaluation of public. The public evaluation shall be an important indicator assessing supervision and inspection management department. It will effectively improve the game yield between supervision and inspection unit and production unit, and develops to a win—win situation.

Situation 3: Analyzing from the perspective of inventive compatibility, the supervision and inspection management department can reward the "standard production" strategy of production unit to some extent while punishing "nonstandard production". For example, the official conducts free publicity; the government builds special reward fund; the government grants subsidy and reduce tax aiming at the price growth in raw materials and so on . The cost in above strategy is w here. Create a new game payoff matrix as shown in Table 3.

Table 3 Reward the "standard production" enterprises

		Manufacturing enterprise	
		Standard production	Non-standard production
Supervision and inspection departments	Act	$-c-w, r+w$	$F-c, R-F$
	Act of omission	$0, r$	$-s, R$

According to the above matrix, the re-solved expected utility function of supervision and inspection management department is:

$$\begin{aligned} E_p &= p \times q \times (-c-w) + 1-q \times F - c + 1-p \times q \times 0 + 1-q \times (-s) \\ &= pF - Fq - c - sq - wq + s + sq - s \end{aligned}$$

And production units expected utility function is:

$$\begin{aligned} E_q &= q \times p \times (r+w) + 1-p \times r + 1-q \times p \times R - F + 1-p \times R \\ &= qr - R + pF + pw + (R - pF) \end{aligned}$$

Under the condition of long-term equilibrium, it can achieve the possibility of "administrative action" of supervision and inspection management department according to the mixed strategy solution of complete information static equilibrium game.

$$p = \frac{R-r}{F+w}$$

The probability that production units select "regulate the production" is:

$$q = \frac{F+s-c}{F+s+w}$$

Analyze the changes of possibility p of "administrative action" of supervision and inspection management department and possibility q of production unit choosing "standard production". After introducing reward variable w into the matrix, we can conclude that:

$$\frac{R-r}{F+w} < \frac{R-r}{F}, \frac{F+s-c}{F+s+w} < \frac{F+s-c}{F+s}$$

It can be seen that the more the government reward is, the smaller the possibility of "administrative action" of supervision and inspection management department and possibility of production unit choosing "standard production" is . It seems to be irrational, but it seems very rational from another perspective. When the supervision and inspection management department is inspecting, it will grant reward for "standard production", minimizing the yield of supervision and inspection management department, so the department will reduce the supervision and inspection on production unit. When the supervision and inspection management department reduces inspection possibility, the production unit will choose the

strategy of “nonstandard production” in order to effectively reduce cost and increase profits. Therefore, when designing the reward mechanism on excellent enterprise, the situation that rewards to the management department of special equipment directly shall be prevented. It shall reward from other fields for the purpose of positive externalities.

Situation 4: The after-event accountability on supervision and inspection management department shall be changed into the behavior accountability. That is to say, it shall claim on the supervision and inspection management department in case of “administrative omission” regardless of accidents. Here, provided the loss caused by “administrative omission” is $-t$, build new game payoff matrix, as shown in table 4. Table 4 when the “consequence” accountability is changed into “behavior” accountability, as for the standard production and nonstandard production, the action of supervision and inspection department is $-c$, $rF-c$, $R-F$, the omission is $-t$, $r-s$, R .

According to the above matrix, the re-solved expected utility function of supervision and inspection management department is:

$$\begin{aligned} E_p &= p \times q \times (-c) + 1 - q \times F - c + 1 - p \times q \times (-t) + 1 - q \times (-s) \\ &= pF - Fq - c + 1 - p \times (sq - s - qt) \end{aligned}$$

And production units expected utility function is:

$$\begin{aligned} E_q &= q \times p \times (r) + 1 - p \times r + 1 - q \times p \times R - F + 1 - p \times R \\ &= qr + (1 - q) \times (R - pF) \end{aligned}$$

Under the condition of long-term equilibrium, it can achieve the possibility of “administrative action” of supervision and inspection management department according to the mixed strategy solution of complete information static equilibrium game.

$$p = \frac{R - r}{F}$$

The probability that production units select “regulate the production” is:

$$q = \frac{F + s - c}{F + s - t}$$

Analyze the changes of possibility p of “administrative action” of supervision and inspection management department and possibility q of production unit choosing “standard production”. After introducing reward variable t into the matrix, we can conclude that:

$$\frac{F + s - c}{F + s - t} = \frac{F + s - c}{F + s}$$

It can be seen that the before-event punishment and after-event treatment during regulation process of special equipment have no effect on the regulation possibility. But, it can effectively improve the possibility of enterprise safety production. In the long run, it can improve the Nash Equilibrium of enterprise safety production. During the production process of special equipment, it shall claim on the regulation department in case of omission found, change the after-event treatment as before-event prevention, in order to increase the possibility of enterprise safety production.

III. Conclusions

Along with the development of China economy society, we can forecast that the quantity of special equipment will increase and the increase rate will rise constantly. At the same time, because of unbalance development level between east and west, the distribution is varied in China, making the safety inspection market with two kinds of extremes. The chaotic phenomenon of “buying certificates” exists in east area due to the huge inspection quantity of special equipment. Because of the safety inspection insufficient, the phenomenon of “watering for fish-farming” exists in west area for the sake of benefits. Facing with the dilemma, the most effective solution is to conduct market-oriented reform on the safety inspection technology organization for special equipment, deviating the technology organizations from public institutions and removing the administrative color. As for the legal inspection on special equipment security, the government can purchase by means of bidding, in order to form a good market environment and guarantee the fairness of regulation department.

In order to better supervise the administrative action level of regulation department, it shall take the public satisfaction as the important indicator of checking on the cadres in regulation department, in order to effectively promote the overall safety level of special equipment. As for the reward on excellent enterprises, it is unnecessary to conduct in this field. It shall design other inventive mechanisms in order to prevent the reward effect is minimized for the sake of self benefits. For example, the excellent enterprises can share tax preference; project approval can access to green channel and other rewards. Finally, it shall build scientific system holding responsible for “detection” behavior. Previously, only the divers involved in significant accidents due to driving after drinking will be regulated and punished, but the effect is not satisfactory. Along with the development of economy and increase in motor vehicles, the accidents caused by drunk drinking are increased constantly per year. Along with the implementation of

“punishing drunk driving”, it can be seen that the accidents caused by drunk driving are minimized obviously. The former looks into the consequence of drunk driving; the latter investigates the behavior of drunk driving. That is to say, the behavior of drunk driving will be punished regardless of accidents. The idea has a good reference in building scientific accountability system.

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Analysis of Quality Safety Game on Special Equipment

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Abstract: In this paper, we study the quality safety of special equipment inspection of each game player. The asymmetric information leads to the risks of special equipment quality safety inspection. With game theory as analysis tool, we build a static game payoff matrix of the government and enterprises, with introducing of fines, penalties, awards and behavioral accountability for different scenarios, to analysis of the effect of different means of special equipment safety. Through the inspection game mechanism between enterprises, and the introduction of different disturbance variables, which changed the Nash equilibrium of production safety, it is concluded that the marketization reform of the special equipment inspection technology institutions are the most fundamental way to solve the quality and safety of special equipment risk.

Key Words: Special Equipment; Quality Safety; Game Analysis

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Research on the Regulation approach to the Dairy Safety Based on the Characteristic of Supply Chain¹

Zhu Jie

Abstract: Dairy safety is one of the top concerns with regard to people's top livelihood issues in China. Since the dairy supply chain can't guarantee the quality, it is necessary to establish the scientific and reasonable dairy regulatory chain and approach. However, China's current dairy safety regulation method fails to cover the characteristics of dairy supply chain, leading to the phenomenon of regulation failure. Based on the components and operating characteristics of the dairy supply chain, measures, such as construction of symmetric supply chain, unification of dairy safety regulation organizations, establishment of trust symbol supply mechanism based on dual inspection and introduction of consumer participation mechanism etc., can be taken to reform the dairy regulation approach.

Keywords: Supply Chain; Dairy Safety; Regulation Approach; Information Asymmetry

Since the occurrence of the "Fuyang inferior milk powder incident" in 2006 and the "Sanlu milk powder incident" in 2008, the dairy quality safety has become one of the top concerns with regard to people's livelihood issues in China (China Quality Observation Group of Wuhan University Institute of Quality Development Strategy, 2013). Taking the Food Safety Law as the benchmark, the State Council issued the Notice of Further Strengthening Safety Work of Dairy Product Quality (referred to as the "notice in 2010") in 2010, Regulations on the Regulation and Administration of the Quality and Safety of Dairy Products as one of the administrative regulations (referred to as the "Dairy Product Regulations") in 2011 and Notice of Advices on Further Strengthening the Safety Work of Infant Formula Milk Power Quality (referred to as the "notice in 2013") in 2013 to regard the dairy safety as the breakthrough of China's food quality safety work. Although the issue of the above three specifications show unprecedented emphasis on dairy safety, they have neither realized good regulatory effect nor changed the people's distrust attitude toward China's dairy safety. This is no doubt because the regulation needs time to take effect on one hand, but on the other hand, it also because the current regulation approach does not completely conform to the characteristics of dairy supply chain. With the dairy supply chain as the observation object, this paper reveals the deficiencies of the current dairy safety regulation approach through analysis on individual cases and specifications and puts forth advices on reform of dairy safety regulation approach based on the characteristics of dairy supply chain.

I. The supply chain and safety of dairy products

Applying supply chain theory to study the governmental regulation issues of food safety has become the "noted school of thought" in food safety research. However, most of papers pay emphasis on the actions and functions of enterprises (especially the core enterprises in the supply chain) according to the research paradigm of management (Tian Yuan, Zhang Wenmin, 2008; Liu Dong, Jia Yu, 2010; Wu Dingyu, 2013) instead of the role, method of government and its connection with the specifications of current food safety laws in food safety regulation. The reason why applying the supply chain theory which belongs to the concept and research paradigm of management to law research is that the supply chain theory is in line with the government's emphasis and process of dairy safety regulation and able to provide new framework for explaining the nature of dairy safety and the government's dairy regulation method.

(I) Dairy supply chain and chain of custody

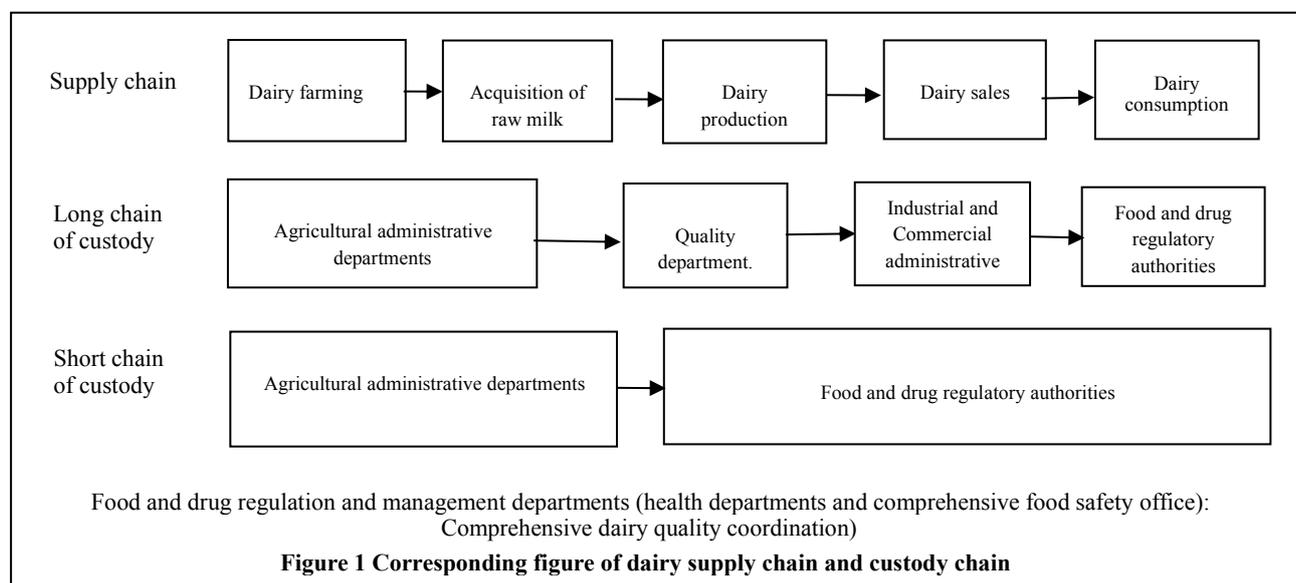
Traditionally used to describe the vertical integration relationship between the production and sales companies, the supply chain refers to a overall functional network structure model which produces the final products by surrounding the core enterprises, purchasing the raw materials and managing information, logistics and cash flow etc. and distributes the products to final consumers by circulation and sales channels at each level (Ma Shihua etc., 2000). Food supply chains develop from the traditional supply chain. Because of the "feed-food" feature of food supply, the food supply chain often extends to production (planting or breeding) link of agricultural products upwards and to consumption link of food downwards. As one type of the food supply chain, the dairy supply chain extends to dairy stock breeding upwards and to consumption link of dairy products by consumers downwards, including dairy stock breeding, fresh and raw milk procurement, dairy production, dairy sales, consumption of consumers

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and other links. The Dairy Product Regulations builds the backbone of the regulatory structure according to the scope of dairy supply chain: the second, third, fourth and fifth chapters of Dairy Product Regulations respectively correspond to dairy stock breeding, fresh and raw milk procurement, dairy production and dairy sales. Therefore, the dairy supply chain not only describes the dairy production process, but also gets confirmed by legal norms.

The dairy supply chain is of the characteristics of long supply chain, which contains higher quality safety risk. Problems such as information asymmetry and lack of trust between links of the dairy supply chain, which will leave adverse effect on information symmetry and mutual trust relationship between links needed for dairy safety, so the safety risk may occur in any link of the supply chain and accumulate. In order to eliminate the dairy safety risk brought by the long supply chain, China adopts the regulatory strategy that forms a “regulation chain” almost completely corresponding to the dairy supply chain, in which the regulation department of each link supervises the corresponding participant in the supply chain. According to Article 4, 6 and 51 of *Dairy Product Regulations*, the agricultural administrative departments are responsible for the regulation of dairy stock breeding, fresh and raw milk production and procurement, the quality regulation, inspection and quarantine departments are responsible for the regulation of dairy production link and import and export link, industry and commerce administration departments is responsible for the regulation and management of dairy sales link, the food and drug regulation and management departments are responsible for the regulation and management of dairy food & drink service link, and the health administrative departments are responsible for comprehensive coordination of regulation and management of dairy quality safety, organization of investigation and treatment of major food safety accidents, organization of development of national dairy quality safety standards and uniform release of information about dairy quality safety accidents. Additionally, according to *Reply to Issues Related to Structure Reform and Responsibility Adjustment of Food Safety Committee Office of State Council issued by State Commission Office for Public Sector Reform* in 2011, the functional authorities of comprehensive food safety coordination, organization of investigation on major food safety accidents and the uniform release of information about major food safety accidents of Ministry of Health are put under the Food Safety Committee Office of State Council (referred to as “Food Safety Committee”), and the corresponding regulation responsibility for dairy safety of the health administrative departments is also put under that office. In the “segmented regulation” system of dairy products, the problems, such as unclear regulation function, ambiguous responsibilities and low efficiency, of the regulation departments for dairy quality safety are caused by inadequately close connection between regulation links and decentralized regulation strength (General Office of the State Council, 2011).

In March 2013, the food safety regulatory system was greatly adjusted through *Plan for the Institutional Restructuring of the State Council and Transformation of Functions Thereof* on the 1st Session of the 12th National People's Congress as follows: the respect food safety regulation responsibilities of Food Safety Committee, State Food and Drug Administration, General Administration of Quality Regulation, Inspection and Quarantine of the People's Republic of China and State Administration for Industry & Commerce of the People's Republic of China were integrated to establish under the new organization of China Food and Drug Administration, which implements uniform regulation and management for food safety in production, circulation and consumption links. The dairy regulatory chain, accordingly, changed from “long regulatory chain” in one-to-one correspondence with the supply chain to the “short regulatory chain” composed only by the agricultural administrative departments and food & drug regulation and management departments. The relationship between the dairy supply chain and the two different regulatory chains before and after 2013 is shown as Figure 1:



The change from the long regulatory chain to the short one indicates that the government has noticed the dilemma of the relationship between the dairy supply chain and regulatory chain: firstly, the long regulatory chain could neither eliminate the phenomena of information asymmetry and lack of trust generated in the long supply chain nor solve the regulation dilemma caused by lack of information and resource share mechanism inside the regulatory chain, and it also led to regulatory resource waste because of coordinating the relationship between participants in the regulatory chain, such as the food safety coordination function of health administrative departments and establishment of Food Safety Committee; secondly, the regulation system with the regulatory chain in one-to-one correspondence with the supply chain failed to achieve preferable regulatory effect, the regulatory chain mainly took the measure of imposing mandatory obligations on participants in the supply chain, which can not reconstruct the basic pattern of dairy supply chain, adjust the interest relationship between participants in the supply chain and mobilize the initiative of those participants to maintain and improve the dairy safety. Nevertheless, the regulation system reform by means of shortening the supply chain can at most solve the dilemma inside the regulatory chain to a limited degree, but can not fundamentally change the internal characteristics and structure of the dairy supply chain. Therefore, with regard to the dairy safety regulation, the regulation approach for dairy safety shall be reformed, in addition to continuous improvement of regulation system.

(II) Food safety and safety of dairy products

The “food safety” is defined as a state in the *Food Safety Law* of China. The “food safety” is legislatively interpreted in Article 99 of Food Safety Law as: non-toxic and harmless food which meets the proper nutritive requirements and causes no acute, sub-acute or chronic hazard to human health. The “quality safety of agricultural products” is defined in the Law of People’s Republic of China on *Quality Safety of Agricultural Products*, issued earlier than Food Safety Law, as that “the quality of the agricultural products meets the requirements of guaranteeing the human health and safety”, which is the same with the definition in *Food Safety Law*. The *Dairy Production Regulations* does not provide specific legislative interpretation for dairy safety. Because the dairy products belong to food, the definition of food safety in Chinese laws can be extended to dairy safety. Based on this, the dairy safety is also defined as a “state” of the dairy in Chinese legal norms. The above definition is the same with that of the food safety provided by WHO before 1996. However, the food sanitation was defined as “a guarantee of no damage to consumers’ health when the food is manufactured or consumed according to the primary purpose” in a report issued by WHO in 1996, which added new connotation to the definition of food safety.

It gives full consideration to the impact of supply chain on the food safety when defining the food safety as a guarantee. The food safety, in general, includes the product attributes and credence attributes (Golan et al., 2003). The former one refers to those quality attributes, including taste, characters, color and appearance, which can be recognized by consumers based on life experience and ordinary senses such as touch, taste and smell. While the latter one refers to those quality attributes which can not be recognized by consumers based on simple life experience and ordinary senses, and consumers can only purchase or consume the food based on trust, which is the reason why it is called as credence attributes. For instance, the consumers can not recognize whether the dairy contains melamine through taste or other ordinary ways, so they can only carry out purchasing or consumption based on their trust in the dairy. The credence attributes of the food safety are subdivided into content attributes and process attributes. The content attributes leave influence on the physical property of the food, which is difficult for the consumers to sense (Golan et al., 2003), for example, the consumers can not recognize the content of melamine in the dairy without professional technology. Process attributes are used to describe the characteristics of the food production process. Generally, neither the consumers nor the professional test equipment can recognize the process attributes (Golan et al., 2003). For example, the process factors, such as whether the milk cow forage is the organic pasture or contains genetically modified materials, and whether the fresh and raw milk is transported by whole freezing chain, can not be learnt from the inspection to the dairy itself, let alone the experience and senses of consumers. The credence attributes of the dairy safety are extremely important for the behavioral choice of consumers: consumers can only carry out consumption by establishing trust in the dairy safety first when having no way of leaning about the real quality conditions of the dairy. For food producers and distributors, the credence attributes of food safety require them to guarantee the safety of food content, production and sales process. Consumers may not trust the producers and distributors themselves, but they trust in the food based on their trust in the guarantee of producers and distributors. This is also the important value of defining the food safety from the “guarantee” perspective.

However, it is a pity that the dairy supply chain fails to provide the trust guarantee needed by consumers: 1. The dairy supply chain is a long supply chain, in which serious information asymmetry exists between the participants, so they can not give effective guarantee alone; 2. The producers and operators in the dairy supply chain, as guided by the core enterprises, may form a community of interests and conceal the major information together; and 3. Under the circumstances that the dairy safety is generally questioned, the extremely low credibility of the main bodies in the dairy supply chain can not meet the need of building trust of consumers. Therefore, the dairy supply chain can only seek guarantee provided by external bodies

for the dairy safety, for it can not provide that by itself.

II. Failures of dairy products safety monitoring method and regulatory

“Regulation” is used to describe the governmental management for market economy activities, which refers to the general rules or special behaviors developed and implemented by administrative institutions to directly intervene in the market configuration mechanism or indirectly change the decisions of supply-demand relationship between enterprises and consumers (Nicolas Spulber, 1999). The regulation is carried out by the government, so the regulation approach is essentially used to change the administrative and legal system framework, which previously controlled the market transactions, by the government (Nicolas Spulber, 1999). The characteristics of the dairy supply chain, the deficiencies of dairy regulatory chain and the “guarantee” nature of the dairy safety decide that the government must supervise the dairy safety with public power. Currently, China’s Food Safety Law and the three above-mentioned specifications about dairy specify the main regulation approach for dairy, but the dairy safety regulation has been out of order (Wang Caixia, 2011) – this is not only subjectively felt by the masses (see Table 1, China Quality Observation Group of Wuhan University Institute of Quality Development Strategy, 2013) but also acknowledged by the government (General Office of the State Council, 2011). The problem of regulation approach itself, besides poor implementation of legal specifications and rent-seeking for some regulators, is also a critical reason for the unsatisfactory dairy safety regulation effect.

Table 1 The CSI comparison of dairy product and major product quality

Projects of subjective evaluation	Customer Satisfaction Index (CSI, full mark=100)
Dairy	62.65
As a comparison to other food products	
Fruits and vegetables	67.68
Grain	66.52
Meat and its products	62.82
As a comparison of product categories	
Ordinary goods	64.72
Household Appliance	69.50
Commodity	66.89
automobile	71.83
Agriculture production material	64.16

Note: It’s adapted from 2012 *Observation Report of China Quality Development* prepared by Wuhan University Institute of Quality Development Strategy

Most of the literatures place the dairy safety regulation approach under the framework of food safety regulation approach instead of special research. Anthony I. Ogus, a Britain scholar, considered that the food safety is the government regulation generated due to market failure, while the market failure is mainly resulted from the information asymmetry between commodity suppliers and consumers, consequently, the government regulation is intended to eliminate and avoid such information asymmetry, and the government shall choose the regulation approach with lower level of intervention, but not excessively intervene in the production and operation of suppliers (Anthony I. Ogus, 2008). The regulation approaches the government could choose involves mandatory information disclosure, standards, prior approval, economic tools and responsibility investigation based on civil laws (private regulation) etc. (Anthony I. Ogus, 2008). Besides, Anthony I. Ogus also mentioned two regulation approaches with lower level of intervention provided in Food Safety Law in 1990 of Britain: 1. authorize the government to issue Code of Conduct to guide the food suppliers; 2. allow the food suppliers to use the fact that they have adopted all the reasonable preventive measures and fulfilled the obligation of prudent attention as the ground for defense, so as to encourage and guide the suppliers to establish food safety self-regulatory system. The conclusion of Anthony I. Ogus is not only the organization of the British food safety regulation approaches but also an analysis framework with generally suitable significance. The following content will organize China’s dairy safety regulation approaches according to this analysis framework and with the combination of China’s *Food Safety Law* and three dairy safety specifications as well as analyze the manifestation patterns and reasons of regulation approach failure based on the characteristics of dairy supply chain.

(I) Information regulation approaches

The information asymmetry is the major factor affecting the safety of dairy products. The main regulation approach for dairy safety is to remedy the information asymmetry between the participants, especially between the production and operation enterprises and consumers, through the intervention of public power. The information regulation approaches of China mainly include mandatory information disclosure system for dairy

production and operation enterprises and the safety information management system of supervision department.

According to the *Dairy Product Regulations*, the mandatory information disclosure system for dairy production and operation enterprises includes safety archive (records and ledgers) system, incoming inspection system and finished product outer packaging label system etc. The mandatory information disclosure system is intended to eliminate the information asymmetry between producers and operators in the dairy supply chain. The safety information management system of supervision department utilizes the quality safety regulation principle of “imitated consumers” (Zhu Jie, 2010a), in which the supervision department, instead of the consumers who are in weak position to get information, achieves dairy risk information through public power and uses the information and resource advantages to publish risk information, such as evaluation, monitoring and centralized disclosure of dairy safety risk, to consumers. The information regulation approaches attempt to remedy and balance the information asymmetry between production and operation enterprises and consumers in the dairy supply chain, so as to build a trust relationship between them.

Information is core of regulatory policies (Breyer, 1982), while information disclosure and screening is the best reaction to information asymmetry (Cass R. Sunstein, 2008). The information regulation approach is the most suitable for the “guarantee” nature of dairy safety and also helpful for beforehand prevention of dairy safety risk. However, the mandatory information disclosure system, in terms of design, is completed mainly by asking for certificates and invoices when carrying out handover between links, so it is lack of effective external regulation. Because the producers and operators share common interests in a whole, it is easy to generate collective silence in dairy producers, operators and their internal employees (Qi Jiangang, 2011), leading to that the mandatory information disclosure system becomes a mere formality. In addition, under the pressure of both work performance and responsibilities, the supervision department fulfills the functions of risk assessment, monitoring and centralized disclosure with limited motivation. Therefore, the practice effect of information regulation approach which is supposed to play a critical role in dairy safety regulation is unsatisfactory.

(II) Proactive regulation approach

The proactive regulation approaches standardize and control the dairy producers and operators in advance by establishment of safety standards, administrative licensing and certification. The proactive regulation approaches specified in the *Dairy Product Regulations* mainly include proactive established dairy safety standards, administrative licensing for each link of dairy supply chain as well as mandatory Hazard Analysis and Critical Control Point System (HACCP system) certification for infant milk powder production etc. The theory of proactive regulation approaches is that the supervision department establishes the safety standards for inspection and review of qualifications of dairy producers and operators in advance and forms external marks with credit granting function (such as license and certification mark) through review of the qualifications of dairy producers and operators and the credibility of public power, so as to provide consumers with externally visible trust symbols and help consumers establish trust in dairy safety. Therefore, the nature of proactive regulation is to convert the trust of consumers in public power to dairy safety, and the supervision department guarantees the dairy safety for dairy producers and operators with its credibility.

The effective base of a proactive regulation approach is the trust of consumers in public power, while such trust is very weak in dairy regulation sector. In practice, absence of consumers in standard establishment, nonfeasance and rent-seeking of supervision department as well as profit preference of certification bodies cause the trust loss of consumers in supervision department. According to the survey report published by Wuhan University Institute of Quality Development Strategy, 91.32% of the respondents think that the quality management effect of Chinese government is “average”, “unsatisfactory” and “very unsatisfactory”, and only 8.1% think the quality management effect is “desired” (China Quality Observation Group of Wuhan University Institute of Quality Development Strategy, 2013) This shows that the consumers generally have no faith in the government’s quality regulation effect and the credibility base of proactive regulation approaches is very weak.

(III) Mandatory supervisory measures

The mandatory supervision measures refer to the regulation approach by which the supervision department uses public power to impose unfavorable burdens on production and operation units who violate the dairy safety specifications. The dairy enterprises shall assume unfavorable burdens if undertaking activities prohibited by legal specifications, such as failing to fulfill the mandatory information disclosure obligation and implement dairy safety standards or carrying out production and operation without permission. The mandatory supervision measures are the last means of the traditional supervision model featured by “order-control” (Anthony I. Ogus, 2008).

The mandatory supervision measures provided in the three dairy safety specifications include credit punishment (such as establishing enterprise “watch list” system and incorporating the records of illegal behaviors into the database of corporate credit information foundation etc.), recall system for production enterprises and recovery system for marketing enterprises, supervision and inspection of regulation department as well as administrative and criminal punishment etc. These regulation approaches play an important role in deterring the dairy producers and operators, punishing and remedying the behaviors against dairy safety specifications. However, these approaches encounter the following problems in practice:

1. a lot of dairy enterprises, especially some small workshops, are free from the national credit system, leading to unsatisfactory credit punishment effect; 2. the current food recall system of China takes the active recall of produces as the principal measure, supplemented by mandatory recall of supervision department (Zhu Jie, 2010a), which depends too much on the self-consciousness of producers, the number of dairy producer recall cases is obviously not in direct proportion to the subjective feeling of consumers for dairy safety, what's worse, the case that some dairy producer negatively responded to the recall requirement of consumers once happened; and 3. Due to the limited number of enforcers in supervision department, fewer dairy safety cases can be supervised, investigated and treated, so that the deterrence and punishment effect of supervision & inspection and administrative & criminal punishment is not obvious.

(IV) Economic tools and encouraging policies

Different from the “order-control” regulation, the economic tools and encouraging policies, through the guidance of economic interests, ensure that the producers and operators operate the company according to the market disciplines or voluntarily make management decisions meeting the safety requirements of consumers (Anthony I. Ogus, 2008). The economic tools and encouraging policies provided in the three dairy safety specifications include subsidies, awards provided for report, credit support, food safety liability insurance and other systems. However, the regulatory effect of the economic tools and encouraging policies is also very limited owing to the negative factors of system design and practice.

The subsidies and credit support are the most useful regulation approaches playing a guiding role among economic tools. Learning the lesson of “Sanlu milk power incident” that the milk station added melamine into the milk for economic benefit, the *Dairy Product Regulations* stipulates in Article 10 that the people’s governments above the provincial level shall arrange funds to support dairy industry development, provide credit support for dairy stock enterprises and establish dairy stock policy insurance system to provide the insured dairy stock enterprises with premium subsidies. However, the regulation approaches of subsidies and credit support are only applicable to dairy stock breeding link at present, not to the product link with larger safety risk.

The report-rewarded system is a regulation approach widely established by regulation department. The nature of the report-rewarded system is a kind of information transaction (Ying Feihu, 2003), the regulation department expects to guide the citizens who have information about dairy safety to participate in the dairy safety regulation through administrative reward, so as to remedy information asymmetry between regulation department and dairy producers and operators. However, the drawbacks such as obvious mismatch between reward standard and information value in our food safety report-rewarded system, complicated reward payment procedures, mandatory real-name reporting and limited measures to keep secret for informers (Ying Feihu, 2013), plus that the degree of interest combination of producers and operators in the supply chain is underestimated, cause a limited regulatory effect of report-rewarded system.

With the commercial insurance companies as the hub, the insurance system guides and standardize the behaviors of dairy producers and operators through premium, insurance rate and insurance object value assessment etc., which should be the hub system of dairy safety regulation. However, the role played by the food safety liability insurance, at least so far, has not appeared (Liang Mijing, 2011), mainly because: 1. the regulation department aims to decentralize the financial risk of the state and enterprises and improve the civil compensation ability for food safety incident by promoting the food safety insurance system, failing to notice that the insurance system is in a hub position in the dairy safety regulation; and 2. the food safety liability insurance system adopts voluntary insurance system instead of mandatory system, and the dairy producers and operators have inadequate motivation to purchase food safety liability insurance, so the insurance system can not play its role.

III. Supervisory approach reform based on dairy supply chain

The dairy safety chaos caused by failure of regulation approaches is consistent with the subject feelings of consumers for dairy safety. In addition to further strengthening the enforcement of current regulation approaches, reforming the regulation approaches to dairy safety, playing the regulatory role in interest allocation and restructuring for participants in the dairy supply chain, improving the initiative of dairy producers and operators to enhance the dairy safety, providing consumers with trust symbols with higher credibility, introducing the mechanism of consumers participating in the regulation and recovering the confidence of consumers for China’s dairy safety are the keys for amendment of current *Food Safety Law* and deep implementation of dairy safety specifications. The paper gives advices for reform of dairy safety regulation approaches based on the components and operational characteristics of dairy supply chain.

(I) Construction of symmetrical supply chain

A longer dairy supply chain contains higher quality safety risk, thus a feasible idea for dairy safety regulation is to reduce the length of supply chain. This idea has been primarily manifested in regulation of infant dairy products. “The infant formula milk powder production enterprises must own self-built and self-controlled milk source”, stipulated in the “notice in 2013”, “any enterprise shall not produce the infant formula milk powder by

means of entrusting, using other's license and sub-packaging and produce different brands of infant formula milk powder with the same formula". These provisions are developed through learning the lesson of uncontrolled quality of Sanlu milk powder due to milk source and multiple original manufacturers (Zhang Yi, Wang Shouyang, 2010), which try to integrate three links of dairy stock breeding, fresh and raw milk procurement and dairy production, and mandatorily require the infant dairy producers to uniformly conduct the business of the three links, so as to shorten the supply chain and reduce the quality risk.

Although the original idea of the "notice in 2013" is in line with the theoretical idea of shortening the supply chain, it fails to notice the interest symmetry after shortening the chain. With the integration of three links of dairy stock breeding, fresh and raw milk procurement and dairy production, the restrictions inside these three links will be eliminated, and complete producers will appear in the supply chain, so that the producers who have already been the core enterprises in the dairy supply chain will get further enhanced authority. Consequently, it is more difficult for the mandatory information disclosure system provided by the Dairy Product Regulations to play the actual effect, and the chronic problem of information asymmetry will be more serious, let alone to be eliminated.

Establish a symmetric supply chain and creating "complete marketers" to form a counterbalance relationship with the complete producer (Golan et al., 2002), which not only meets the idea of shortening the supply chain, but also strengthens the restrictive relations inside the supply chain. The symmetric supply chain refers to the supply chain in which the dairy products are produced by producers who also carry out dairy stock breeding business and marketed by large specialized market or chain supermarket. The regulation department shall implement special permit stricter than general food circulation permit conditions for marketing companies engaged in dairy products, and when necessary, issue limited number of permit, so as to control the quantity of dairy marketing companies. The symmetric dairy supply chain, in terms of production, is in form of self-contained or self-supplied milk source, make-to-order system, uniform logistics and centralized cargo allocation etc.; as to sales, the marketing companies will decide the brand and quantity to be ordered, carry out centralized incoming inspection and counterbalance the core position of producers with their comparatively centralized control of sales channels.

The symmetric supply chain is expected to play the following roles: 1. form the mode of "dual core enterprises" of dairy supply chain to overcome the drawback of producers as the only core enterprises and drive the interest restructuring of participants in the dairy supply chain; 2. form a comparatively closed dairy supply chain through complete producers and complete marketers, so as to incorporate and restrict scattered small workshops involved in dairy production and operation activities and gradually eliminate the disordered production and operation of small workshops; 3. reduce the regulatory links and simplify the responsibility allocation mechanism to enhance the service efficiency of mandatory supervision measures.

(II) Create a single dairy safety regulatory agency

With the reform of food safety regulation system in 2013, our dairy regulation chain is shortened. Sub-regulation ills get overcome to some extent. However, the current short regulation chain is still regulated respectively by agricultural administrative department and food & drug safety regulation department, easily leading to the government regulatory loopholes. What's even worse, due to lack of integrated resources inside the regulatory chain caused by segmented regulation, only the passive regulation and post-mortem supervision can be adopted for dairy safety, and "redress" becomes the only approach (Pei, 2011).

The only way to completely eliminate the drawbacks of segmented regulation is to establish a single dairy safety regulatory body, so as to uniformly undertake the regulation work for dairy safety. The single dairy safety regulatory body shall have characteristics as follows: 1. cover the whole process of dairy supply chain from dairy stock breeding, fresh & raw milk procurement, production, marketing to consumption, including comprehensive functions such as investigation on major food safety accidents and exclusive release of major food safety information; 2. establish a vertical management system independent of the local government, at least similar to a current quality and technology supervision system below provincial level; so as to avoid the influence of local protectionism on dairy safety; 3. the single dairy safety regulatory body only realizes organic unification of functions, while the development of dairy safety standards, qualification assessment for dairy inspection institutions and certification authorities and other matters will still be assumed by other departments, so as to restrain the single dairy safety regulatory body and form a departmental layout of "organic unification of functions and reasonable separation of features" (Zhu Jie, 2010b); and 4. the single dairy safety regulatory body shall use the favorable system advantage of regulation for the whole supply chain as well as comprehensively apply the regulation resources and approaches to establish the backtracking regulation which "moves the mandatory measures forwards", so as to realize the transformation of dairy safety regulation from punishment to prevention (Rouvière et al., 2012). With the combination of the current mechanism, the China Food and Drug Administration can act as the single dairy safety regulatory body to assume the responsibility of unified regulation for dairy safety.

Integrating the symmetric supply chain and single dairy safety regulatory body, the Figure 1, which shows the correspondence between dairy supply chain and regulatory chain, can be modified to Figure 2:

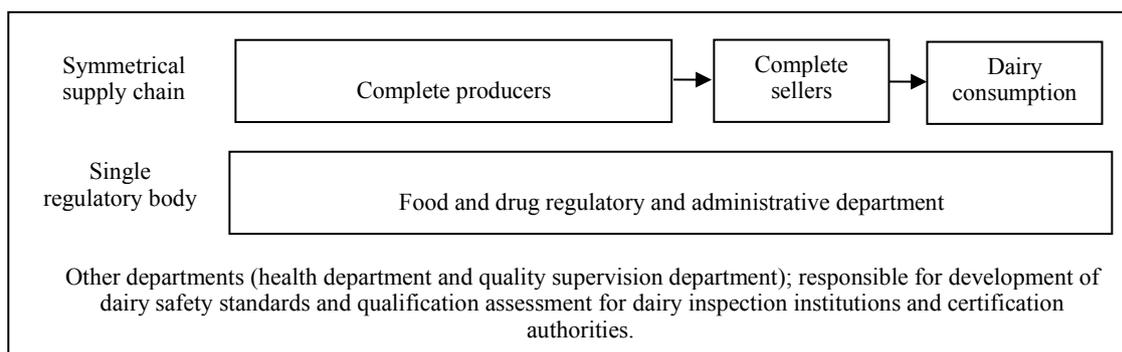


Figure 2 Corresponding figure of dairy supply chain and custody chain

(III) Establish trust symbol supply system based on dual inspection

Letting the external bodies with credibility provide trust symbols (such as license, inspection report and certification mark etc.) is an important approach to help consumers trust the dairy supply chain. The bodies with power provide the dairy trust symbols based on the inspection for whether the dairy products conform to the safety standards, thus the credibility of the inspection institutions is critical for the reliability of dairy trust symbols. Currently, the inspection work for dairy safety is mainly undertaken by state-owned testing organizations, most of which are attached to supervision organizations (food and drug supervision and management departments), as a result, the consumers mentally think that the trust symbols provided by state-owned testing organizations have stronger public power attributes. However, under the circumstances of the regulatory effect of public power generally questioned by consumers, the trust symbols solely provided by state-owned testing organizations obviously have inadequate credibility. Therefore, it is necessary to introduce the third-party testing organizations (foreign-owned or private testing organizations) with no public power and independent of the dairy supply chain and regulatory chain. Given the interest-oriented nature of the third-party testing organizations, the state-owned testing organizations will still be the important inspector, strengthening the accuracy and objectiveness of the inspection results, so that the dual inspection of both state-owned and the third-party testing organizations can be formed.

The cooperation of public and private departments has been the common practice for food safety regulation in developed countries (Henson et al., 1999). Establishing the trust symbol supply mechanism based on dual inspection, changing the single testing system provided by *Dairy Product Regulations* and other specifications and introducing the approach of cooperative regulation of public and private organization can enhance the reliability of the trust symbols and balance the information asymmetry between consumers and dairy producers and operators generated by content attributes and process attributes of dairy safety. This mechanism will definitely bring about new challenges, including the regulation for the third-party testing organizations and joint rent-seeking caused by common interests between state-owned and the third-party testing organizations etc. The approach to these problems is to let the departments other than food and drug supervision and management departments assess and supervise the third-party testing organizations, so as to enlarge the system separation between state-owned and the third-party testing organizations and form the “separation and counterbalancing” relationship.

(IV) The introduction of consumer participation mechanisms

Located at the bottom of the dairy supply chain, the consumers make no substantial influence on the dairy safety and passively accept the state of dairy safety. The dairy safety regulation often adopts the theory of “imitated fictional consumers”, which imitates the regulation bodies as the consumers instead of paying attention to the function of real consumers. Consumers are the largest stakeholder of dairy safety and also the direct victims of dairy safety incidents, so they shall not be absent in the dairy safety regulation. Consumer participation mechanism runs through the whole dairy regulation process, while the mechanism urgently required to be established now is the consumers participating in the development of dairy safety standards and information acquisition.

First of all, establish the mechanism of consumers or experts employed by consumers participating in the development of dairy safety standards. The dairy safety standards decide the dairy safety from the source. However, due to the system, the consumers are absent in the development of dairy safety standards, resulting in that the dairy safety standards reflect the will of regulation departments and large dairy producers and operators to a higher extent (Dong Wei, 2011). In April 2010, the national food safety standard of *Raw Milk* (GB19301-2010) was issued by the Ministry of Health, in which the protein content is lower than the same standard of developed countries, while the total plate count is 20 times as much as the same standard of developed countries. A citizen, surnamed Zhao, requested the Ministry of Health to publish the minutes of standard development

meetings, but the Ministry of Health refused. What's more, Zhao lodged administrative proceedings against the Ministry of Health, but the verdict was in favor of the Ministry of Health (Yang Yuze, 2012). It can be seen from the case that it is even difficult for the ordinary consumers to obtain the information generated in the process of standard development, let alone to participate in the development. In fact, even though the Ministry of Health publishes the minutes of standard development meetings and even allow them to participate in the meetings, the consumers without expertise can not effectively participate in the standard development. Therefore, to reflect the interests of consumers in dairy safety standards, the mechanism of consumers participating in the development of dairy safety standards shall be established. In view of the professionalism of the standards, the delegates of consumer organizations and the experts employed by consumers are also allowed to participate in the standard development.

Secondly, incorporate the subjective evaluation of consumers on the dairy safety into the acquisition range of dairy safety information. According to the "notice in 2010", the range of dairy safety information acquired by the regulation department includes information and data of producers and operators as well as the information from milk source, procurement, production, delivery, transportation to sales end, while the subjective evaluation of consumers on the dairy safety is not included in this range. This regulation does neither pay attention to the important status of subjective evaluation of consumers in the dairy safety regulation, nor meet the demands of consumers (See Table 2). Based on this, the regulation department shall incorporate the subjective evaluation of consumers on the dairy safety into the acquisition range and take their evaluation as an important basis for development and implementation of dairy regulation approaches when collecting dairy safety information.

Table 2 Statistical results of consumers' answers to where do you think the government shall get the quality safety information from (%)

Question items	Options	Statistical results (%)
Where do you think the government shall get the quality safety information from?	Consumer use information	74.74
	Product testing information	70.46
	Corporate governance process information	58.27
	Product sales process information	45.56

Note: This table is quoted from 2012 China Quality Development Observation Report.

IV. Conclusions

The supervision is the constant and centralized control imposed by public institutions targeted at activities which the social community considers important (Augus, 2008). The dairy safety is one of the important issues concerned by the social community at present. The safety regulation of food, including dairy products, is different from other administrative affairs, of which the characteristics of the supply chain must be concerned in the event of establishing regulation system and designing regulation approaches. Reviewing the current dairy safety regulation approaches and reasons for regulation failure and putting forward corresponding reform advices, based on the characteristics of dairy supply chain, have important and realistic significance for the improvement of dairy safety regulation approaches. This paper is a theoretical attempt in this regard.

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Research on the Regulatory Approach to the Dairy Safety Based on the Characteristic of Supply Chain

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Abstract: Dairy Safety is one of the hottest issues in China. Because of the lacking of guarantee for the quality of dairy products, it is necessary for the dairy supply chain to construct scientific as well as practical way to ensure the safety of dairy products. However, China's current regulatory approach to dairy safety fails to note the characteristics of dairy supply chain, resulting in the phenomenon of regulatory failure. Based on the composition as well as the operational characteristics of dairy supply chain, shaping the symmetrical supply chain, establishing unified dairy safety regulator, delivering trust symbols from double-level mechanism of inspection as well as introducing consumers' participation contribute the ways of reform.

Key Words: Supply Chain; Dairy Safety; Regulatory Approach; Information Asymmetry

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Theoretical Framework and Institutional Innovation of Standards Based on Interests Consistency¹ ——A Case Study on Coalition Standards

Cheng Hong, Liu Yun

Abstract: Based on the case of “union standard”, the paper studies the existing problems in standard system and puts forward the standard theoretical framework of interest consistency and innovation path. The union standard is the standard formulated by members in certain industry on the basis of consensus, which reflects the internal interests of members and can be implemented better because it is suitable for the changes in industry and technology. The fundamental problem of China existing standard system is that the constitutors and users lack high consistency in benefits. The conflict of interests exists in mandatory and voluntary, stability and variation, formulation and implementation. The paper suggests to reform China existing standard system, establish national standard system consisting of government standards and group standards (including union standards), in order to construct the formulating body of government standards and social standards, govern the government standards and group standards and share standard fundamentality functions and innovation functions.

Keywords: Interest Consistency; General Theory, Standard System; Case Study

I. Raise of the problems

The standard types in the existing standard system in China include national standard, industrial standards, local standards and enterprise standards. The paper excludes the enterprise standards reflecting the internal interest of single enterprise and limiting influence range. In addition to enterprise standards, various standards in China, whether national standards, industrial standards, local standards or mandatory standards or voluntary standards, are formulated, implemented and supervised by government organization. There are two problems for the standard system led by government: more standard setting and less effective implementation; standard falls behind the requirements of changes in industry and technology. Therefore, China has taken various measures, such as intensifying standardization planning, establishing Technical Committee for Standardization (TC) led by leading enterprise and subcommittee (SC), accessing the standard setting quality of TC and SC, etc; however, the two main problems still trouble China standard system. Therefore, it shall study the fundamental reasons for existing problems from new perspective and find out the correct solutions.

²³At abroad, the standards are negotiated by the market and society voluntarily and the implementation rate is very high. The world's largest organization enacting international standard – international standardization organization (ISO for short) is a nongovernmental organization, where the standards are voluntary standards and applied by the market and society voluntarily. For the sake of interests of all parties, the participants shall negotiate upon enactment. The standards formulated by ISO are widely recognized and applied nationwide, such as ISO Quality Management System Standard ISO 9001. The standard has been applied by 1,101,272 from 184 countries and regions up² to 2012. Most developed countries have set up the standards adopted by government standard and quoting from social voluntary standards, such as America standard system mainly consists of voluntary standards, which is formulated by non-government standard organization on the basis of voluntary and negotiation (OMB, 1998). At present, over 600 standardization organizations have formulated about 50,000 voluntary standards (Breitenberg, 2009). The standardization organizations compete with each other. 20 standardizations organizations have formulated 90% standards³ throughout the United States. So does EC standard. In addition to government's technical regulations and orders, most standards are voluntary standards formulated by social organizations.

1 Cheng Hong, Wuhan University Institute of Quality Development Strategy (IQDS), E-mail: 919637855@qq.com; Liu Yun, IODS, E-mail: joanna0616@gmail.com. This paper is the initial output of Chinese national-sponsored social science major program (11&ZD158), the 12th Five-Year Plan national science and technology supporting program (2011BAK06B06), public welfare industry scientific research project by Ministry of Science and Technology (201210117, 201310202) and soft program of National Standardization Management Committee “Necessity and Feasibility Study of Group Standard and Management System Design”. Heartfelt thanks are expressed to Dr. Yu Hongwei, and Dr. Yu Fan for their constructive suggestions. Also great thanks are sent to anonymous reviewers for their valuable recommendations, and the author shall take sole responsibilities for his views.

2 Data source: ISO, ISO Survey 2012, <http://www.iso.org/iso/home/standards/certification/iso-survey.htm>.

3 Data source: ANSI, Domestic Programs (American National Standards) Overview, http://www.ansi.org/standards_activities/domestic_programs/overview.aspx?menuid=3.

Even though the government's technical regulations lack of detailed requirements, which are supplemented by voluntary standard formulated by social organization (European Commission, 1999). Foreign standard system consists of two types of standards in fact: one is government standard meeting public interests; the other is social standard meeting market interests.

A new kind of standard type rather than existing standard system came forth since the end of 1990s, which is coalition standard. Coalition standard refers to the standards formulated and implemented by the organizations constituted by members in certain industry upon negotiation for the sake of common interests of this industry. Overall, coalition standard is not involved in government's existing standard system and has no implementation mechanism with administrative force, while it is favored by many enterprises and supported by local governments and standardization administrative department in charge. Why the coalition standard besides national standard system is developing rapidly? What does that mean to China existing standard system? The paper will study the meaning of coalition standard on innovation of China standard system based on the case.

The paper puts forward that the fundamental reason for existing problems in China standard system is that the constitutors and users lack of high consistency in benefits. To solve the problems of more standard setting and less effective implementation, and standard falling behind the development in industry and technology, it shall achieve the consistent internal interests between constitutors and users in the aspect of system.

After raising the problems, the paper's structure is as follows: section 2 studies the case of coalition standards for industrial water machine in Shawan Town, Fanyu District, Guangzhou City, Guangdong Province; section 3 puts forward the general theoretical framework of internal interest consistency based on the development of China coalition standards; section 4 analyzes the interest conflicts among China existing standard system; lastly, the paper puts forward the policy suggestion to China standard system reform and innovation from the perspective of interest consistency.

II. Shawan town industrial washing machines Union standards came into being.¹

Shawan Town, Fanyu District, Guangzhou City, Guangdong Province (hereafter referred to as "Shawan Town") is located in the interior of Pearl River Delta, which is an ancient town in south of the Five Ridges boasting more than 800-year history and culture. Shawan Town is the largest manufacturing base of industrial water machine in China, which has gone through four development stages of starting up, large-scale production, crisis, innovation and rising since 1980s. The principal line of standard runs through from beginning to end. The formulation and implementation of coalition standards is the main reason for the industry decay. Although the coalition standard for industrial water machine is only one of multiple ones, it has been the typical case with its excellent performance.

(I) Starting up and development of water machine industry without definite standards and references

Shawan Town boasts superior location, which is faced with Shunde District, Foshan crossing a river in the west, connected with Nansha District, Guangzhou City in south, and adjacent to Shiqi Town, Fanyu District in east, and it is 27km away from Guangzhou city, 21 km from Shunde District, and 64 nm from Hong Kong and Macao. Therefore, it is an important hub connecting Guangzhou, Hongkong and Macao. Source: Guangzhou Planning Bureau, 2004: *Overall planning of Shawan Town, Fanyu District, Guangzhou City (2003-2020)*.

Shawan Town is the first place to produce water machine. Tong Xin Manufactory of Panyu, Guangzhou (the predecessor was a commune corporation founded in 1969) produced China's first industrial water machine after introducing foreign technologies in 1978. Industrial water machine is engaged in the mechanization of daily manual washing, for the purpose of clean and soft clothes through the procedures of water-feeding, washing, dewatering and dehydration. It is especially applicable to hotels, public houses, hospitals and washhouses. Industrial water machine is a kind of industrial machinery washing textiles specially. Based on industrial washing machine, the machine adds the functions of processing diverse garments, including adding the materials of stone, enzymes, alkali and potassium permanganate during washing, in order to stale, fade, damage and add snowflake. The "destructive" function is necessary during the production of jeans wear. As industrial washing machines are evolved from industrial laundry machinery, they have followed light industry standards for industrial laundry machinery, namely QB/T2323-1997 *Industrial Laundry Machinery*, later modified to QB/T2323-2004 *Industrial Laundry Machinery* in 2005.

Since the late 1980s, denim garment industry has formed industrial clusters in the areas² such as Zengcheng District of Guangzhou City, Dayong Town of Zhongshan City, Jun'an Town of Shunde District, Foshan City around Shawan Town, which generates a lot of demands for industrial washing machine equipment of the upstream. Due to the first-mover advantage of Shawan town in industrial washing machines, a large number of management, operational and technical staff in the industrial washing machine area separated from concentric machinery plant founded more than 40 industrial washing machine enterprises of varying sizes at Shawan Town. Coupled with the unique traffic area of Shawan Town, especially the

1 The data in this part mainly is the collected internal information from Panyu Dyeing Machinery Standard Alliance, and the interview with Limei, the secretary-general of Panyu Shawan Dyeing Machinery Industry Association.

2 As the regional administrative divisions vary in time, in order to describe accurately, here is unified the current administrative division, i.e. Zengcheng District Guangzhou, Dayong Town Zhongshan City and Jun'an Town Shunde District Foshan City.

special opening policy advantages in Guangdong, Shawan Town has occupied more than 70% market share of the domestic industrial washing machine and equipment manufacturing industry and owned 80% of the similar enterprises in China in the late 1990s; the products are also exported to 30 countries and regions such as America, Europe, Southeast Asia, etc.

Except for the special policies and regional needs of unique denim garment production in Guangdong, there is one more essential factor for the prosperity and development of the industrial washing machine industry in Shawan Town, i.e. industrial washing machine industry was almost under completely free competition then, while the government had neither time nor ability to formulate relevant policies and standards for the industry, but only asked enterprises to consult the existing corporate standards for industrial laundry machinery then. It is the ambiguity of the standard that gives the enterprises innovative space, so that entrepreneurs could drive the development of the industry in accordance with the needs of the market.

(II) Vicious competition crisis caused by standard lag

More and more entrants of industrial washing machine industry, which promotes the expansion of the industry on one hand and brings more intense competitions on the other hand. However, competition is not moving in an orderly direction; on the contrary, many companies used the space of setting no standard, and adopted the manufacturing methods that can better meet low-price competition in materials, processes, and performance; in a period of time, lower price got more competitive, so that more and more companies had to manufacture products at lower prices. At that time, the reason for the confusion of the industrial washing machine industry in Shawan Town was that there was no basic standard specification in the scaled market transaction.

Compared with industrial laundry machinery, industrial washing machines has no dehydration process required by the standard for industrial laundry machinery, and they could not meet the clean rate requirements after cleaning, because the fundamental differences exist between these two; Due to the stone and anti-acid and alkali resistant, industrial washing machine needs more robust materials; in addition, industrial washing machines have to be under ongoing mass production, which sets a higher demand for environmental protection, water conservation and consumption reduction. However, the industry standards for industrial washing machines consulted by the washing machines then only regulated the fabric moisture, vibration performance, and level control, drainage time, heating time, clean rates, mechanical damage and other key performance indicators, which cannot meet the specific requirements of industrial washing machines. Due to lack of parameters standards suitable for industrial washing machines, the products could not be determined qualified or not, resulting in a space for the products of low prices in transaction. Early in the development of the industry, there was no standard that could promote the development of the industry, because the lack of standards was able to create space of development for the products that could fill the gaps of the functional requirements. However, when the industry developed to a certain size, standards that could more closely match the products are needed, and market order needs to be regulated. In large-scale stage, if there is a lack of standards, the phenomenon of “bad money drives out good money” is bound to appear, and even more “bad money” would result in space losing of any “good money”, so that the crisis of the industry development ensues. At that time, the washing machine industry in Shawan Town was under such a situation; a large number of low-quality products flooded the market, making the buyers of industrial washing machines generated widespread distrust for the ones produced in Shawan Town, and this distrust had set a serious threat to the survival of industrial washing machine industry in Shawan Town.

(III) Standard specification urgent needs of industry competition

From 2006 to 2007, the vicious competition among enterprises of industrial washing machine in Shawan Town reached its peak, and several largest leading companies were hit hardest. Tongxin Machinery Plant, Junye Hongda Washing and Dyeing Machine Company and other big enterprises felt that such disorderly competition would lead to the collapse of the entire industry; therefore, they requested the local government to help regulate the disorderly market order. However, the government also lacked an effective means of governance; since there are no standard criteria for the facing market, there is no basis to determine what low-quality products are, in turn, it could only ask the industry to strengthen self-discipline. Due to vicious competition, the enterprises within the industry have long been at daggers drawn, so there was no effective means of self-regulation. Similarly, in 1998, a specification intending to mahogany furniture has been jointly developed by the mahogany furniture manufacturers in the gathering area of mahogany furniture industry, Dayong Town of Zhongshan City that is not far from Shawan Town, because these manufacturers could not find the same type of standards in national standards system, and they could only name the standards as Enterprise Alliance Standards¹; at Shunde District of Foshan City, a river away from Shawan Town, two gas appliance manufacturers Guangdong Vanward Group Co., Ltd. and Guangdong Macro Gas Appliance Co., Ltd. reached an agreement to develop Alliance Standards for domestic condensing gas instantaneous water

¹ Generally, the *Mahogany Furniture Standard* development by Dayong Town Zhongshan City in 1988 is regarded as the “prototype” of union standard. As there is no union standard in national standard system, so it is managed by enterprise standard approach, and is named Enterprise Alliance Standard.

heater in 2005, ending the 10 years vicious competition between the two companies. The situation Mahogany furniture and water heaters industries facing is surprisingly similar to that of industrial washing machine industry in Shawan town then; when it was at the end of the rope, all the enterprises voluntarily built alliances and developed standards to regulate the common behavior. Under the enlightenment of this experience, the industrial washing machine industry in Shawan town that seemed to be at its end of rope proposed a method to imitate mahogany furniture and water heater industry to develop Alliance Standards, so as to standard the competition of the industry. This proposal was quickly approved by most enterprises of the industrial washing machine industry in Shawan Town, and supported by the local government support.

On April 19, 2007, “Panyu Washing and Dyeing machinery Standards Alliance”¹ was officially established by Shawan Junye Hongda Washing and Dyeing Machinery Company, Tongxin Machinery Plant, LG Washing and Dyeing Equipment Company, Changda Machinery Manufacturing Co., Ltd. Shengye Mechanical Engineering Co., Ltd., Qiangye Machinery Co., Ltd., Yi Huang Wahing and Dyeing Equipment Manufacturing Co., and “drafting group of experts for Panyu Washing and Dyeing machinery Standards Alliance” was composed of experts coming from the 7 alliance enterprises. Six days after the establishment of the Alliance, they went to Shunde to learn, held a meeting at Shunfeng Mountain Villa of Shunde in the evening, passed the *Constitution for Panyu Dyeing and Machinery Alliance*, and specified the related responsibilities and obligations of the alliance members. Immediately, based on ISO 10472-1-1997 *Safety Requirements for Industrial Laundry Machinery*, UL 1206-2003 *Safety Requirements for Industrial Laundry Machinery of the United States* and other standards, the Alliance developed Alliance Standards which could be met by half of the industrial washing machines enterprises with their level of technology then. The Alliance Standards expanded the scope of the industrial laundry machinery, and called fabric washing, washing and dyeing, bleaching and dyeing, stone washing and dyeing machinery as industrial washing machines in unification, and solved the contradictions between industrial washing machines and industrial laundry machinery in production; in the Alliance Standards, industrial washing machines was defined as “industrial dyeing machinery without dehydration function”. For materials, in order to meet the special washing requirements for industrial washing machines, the standards specified that the materials inside and outside the roller shall be made of stainless steel. In addition, in order to regulate the production of industrial washing machines, the standards specified load rate, roller diameter, roller length, motor power, the use of bearing type, weight, and other key parameters. This Alliance Standards was basically formed in June, and asked for the views of stakeholders and experts in July, which further regulated the expression and formatting requirements of the standard. After the overwhelmingly approval of the participated units of the alliance, DBL440100 / T 1-2007 *Industrial Washing Machine* was issued on August 8, becoming the first Alliance Standards in Guangzhou.

It took less than four months from the formation of the Standards Alliance to the official release; the reasons for such a speed is that the standards were developed by professional enterprises of industrial washing machine in Shawan Town, so both the technical problems and standard level are industry knowledge of these enterprises. It can be seen that the rapid development of Alliance Standards is not equal to be unprofessional or rough, and it will never be “kidnapped” by a small part of leading enterprises or backward enterprises; instead, the standards meet the common needs of most enterprises on the basis of years of professional experience in the industry.

(IV) The implementation of standards promotes the re-emergence of the industry

The reason why the Alliance developed standards is for application, so it stipulates that those products which meet Alliance Standards shall be labeled “security label of Alliance Standards”, thereby ensuring the implementation of standards. After the adoption of the standard, the 7 major companies involved in standard-setting immediately adjusted mold as required, and modified product specifications, so that the products are in line with Alliance Standards in safety, performance, materials, structure, energy consumption and other indicators. To safeguard their own interests, each enterprise took the initiative to report those manufactures who do not comply with Alliance Standards, making the implementation of Union standards up to 100%. Alliance Standards also makes transactions of industrial washing machines have transparent and workable basis: before the setting of standards, Panyu Shengye Mechanical Engineering Co., Ltd. had been unable to persuade customers of Sri Lanka to buy their products, because there is no basis to prove their level of product quality; after the customers understood the Alliance Standards, especially that Shengye Machinery has met the Alliance Standards, the customers quickly signed procurement contracts with it. Customers choose products based on Alliance Standards, making nearly half of enterprises of industrial washing machines in Shawan Town that failed to meet Alliance Standards be eliminated. Alliance Standards also provide a standardized basis for government supervision: before the enactment of the standards in 2007, the pass rate of supervision inspection of industrial washing machine in Shawan Town was 15.8%, and it increased significantly to 90.6% in 2009, and it was up to 100% after 2010.

After the development and implementation of Alliance Standards for industrial washing machines in Shawan Town, the 7 enterprises within the

1 Although the union name is “Panyu Dyeing Machinery Standard Alliance”, it is composed of washing machine enterprises in Shawan Town, and subsequently joined by some enterprises in Panyu District and Guangzhou.

Alliance significantly improve the quality of products, which effectively drives other companies to join the alliance, so the current number of members has been extended to 22. The economic benefits brought by the Alliance Standards are also very significant, the industry output in 2012 increased by more than one time compared with 2007, and the industrial washing machine industry in Shawan Town embarked on the road to recovery.

III. Theoretical analysis on the interests' consistency of Union standards

Alliance Standards for industrial washing machines in Shawan Town is a microcosm of the development of the National Alliance Standards. Up to September 2011, Zhejiang has developed, promoted and implemented 120 alliance standards¹ in 73 massive economic industries; Up to May 2012, the Guangdong Province has developed and implemented 283 alliance standards²; alliance standards are even developing rapidly in electronic information, new energy, semiconductor lighting and other emerging industries. As standards developed and implemented by independent member of the industry, alliance standards get strong growth outside the current standard system, and the fundamental reason is that it reflects the self-interest of these members, and the standard setters and users have reached a consensus in intrinsic interest.

(I) Alliance standards fully reflect the participants' intrinsic interest and needs in standardizing the order of market competition.

Market economy is an economy of rules, among which the “invisible hand” generated from market, can be adjusted based on price, which constitutes the basic order of the market economy. Due to this spontaneous order of the market, the bad behavior can be automatically adjusted, thus it can be called a “natural order”. However, only relying on the natural order of the market economy cannot solve monopoly, externalities, information asymmetries and other market failures, especially protection of property rights, thus there is a strong need for government to use legal means to maintain order and ensure fair trade, which results in another order of the market economy – “legal order”. Natural order and legal order occupy both ends of the market economic order, while there are a large number of blank fields that cannot be regulated by these two orders in the middle ground between these two extremes, such as a common product acceptance criteria in the industry, a confirmation of vocational qualifications in the emerging field, etc.; such fields can neither rely on the enterprises that have conflict of interest in itself and spontaneously regulate themselves, nor the government that has insufficient resources and speed of response to formulate legislation to regulate. The category that is between spontaneity and human organizing is the result of human action rather than the result of human design (Hayek, 1973). Thus, “standard order” came into existence between the spontaneous orders of nature and the law and order of man-made organization, while the government-mandated degree and the spontaneity degree of market is at the middle level. Standard order is a order and specification that is formed on the basis of voluntary agreement of market and social players; as this voluntary agreement reflects the common wishes and interests of the participants, it seems to be free, although there is strong internal binding. Standards are able to strengthen the interests of all the participants, while those members who do not want to perform standards have standards that are higher than the common ones or will be eliminated from this filed regulated by the standards. Therefore, the standard actually makes up the disadvantages of the natural order and legal order as a specification of market order, and it can achieve the consistent order of social members in the field where both the natural order and legal order cannot govern. The natural order, the standard order and the legal order constitute a system of rules of market economy, which can be expressed as the following order diagram of market economy (see Figure 1):

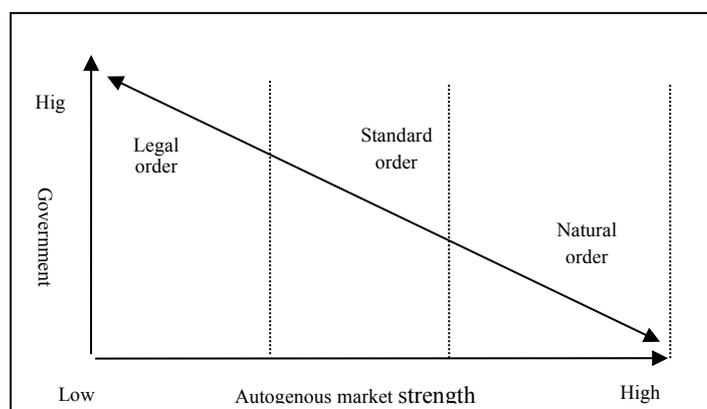


Figure 1 Figure of market economic order

¹Data source: Qu Lingyan, 2011: *Zhejiang: Union Standard has promoted the Transformation and Upgrading of Massive Industry*, Xinhua News Agency, Sep. 28th.

²Data source: Chen Jinhan, 2012: *Vigorously implementing Union Standard, Promoting Industrial Transforming and Upgrading*, China Standardization, 2012 monograph.

The maturity of a national and regional market economy can be observed and measured from the above three kinds of orders. Further analysis is: the natural order is endogenous to the market itself, and it is almost a spontaneous choice of market; while legal order can be initially established by relying on transplants and imitation. Market economy of countries in transition has achieved remarkable results in the natural order and legal order, but why does it take so long to develop into a more mature market economy? The reason is that the standard order has not been established, but the orders have been formed in both ends, while a lot of blank areas in the middle cannot be governed effectively because of a lack of the development of standard order; the blank areas can only fluctuate between absolutely free competition and excessive government force, and a more balanced market economic order cannot be established by relying on the remedy of standard order.

The main reason why the alliance standard has developed rapidly in China is that it reflects the inherent requirements for the orders of market economy, i.e. the market players that form a scale gradually begin to seek a new order that can reflect the self-interest of them between natural order and legal order, and the main way to achieve such new order is alliance standard. The fields adopting alliance standard to govern are those emerging industries for which the government had no time to carry out the order supplying due to rapid changes, or those over-competitive industries whose vicious free competition makes the industry lack basic discipline. To get a normal development, the enterprises within the industry can only conduct self-organizing and formulate various standards to regulate their own acts. In fact, alliance standard comes into existence based on the basic interests and needs of the survival and development of enterprises and industries, so did the development of the Alliance Standards for industrial washing machines in Shawan Town. The Alliance Standards for mahogany furniture at Dayong Town of Zhongshan City came into existence in the same context; mahogany furniture produced in the South tend to crack due to the dry climate when they transported to Beijing and other northern regions; in a product review conducted by Beijing Consumer Association in the 1990s, all the mahogany furniture produced in Dayong Town were thereby judged to be unqualified. Faced with such a market crisis that affected the life and death of the mahogany furniture industry in Dayong Town, the mahogany furniture enterprises in Dayong Town could only come together and develop alliance standards to solve such problems.

Alliance standard is an order selection aiming to meet the interests and needs of enterprises and industries for survival and development, and it is formulated by the market itself and regulated by itself. Because of the lack of standard order, some enterprises cannot survive in the disordered market competition, and the industry is also in an urgent need to establish a standard to obtain sustainable development, so the enterprises take the initiative to set up an alliance and develop alliance standard themselves, thereby the remedy to the rules and norms of market economy can be achieved. Meanwhile, the market players who developed the standards are standard users themselves, so the alliance standards developed by them can better meet the interests and needs of participants, and the established basic system device can promote the survival of the enterprises and the development of the industries. The standard generation mode of market players independently regulating the market order and guaranteeing the survival of enterprise and development of the industry is the setting mechanism of alliance standards (Figure 2).

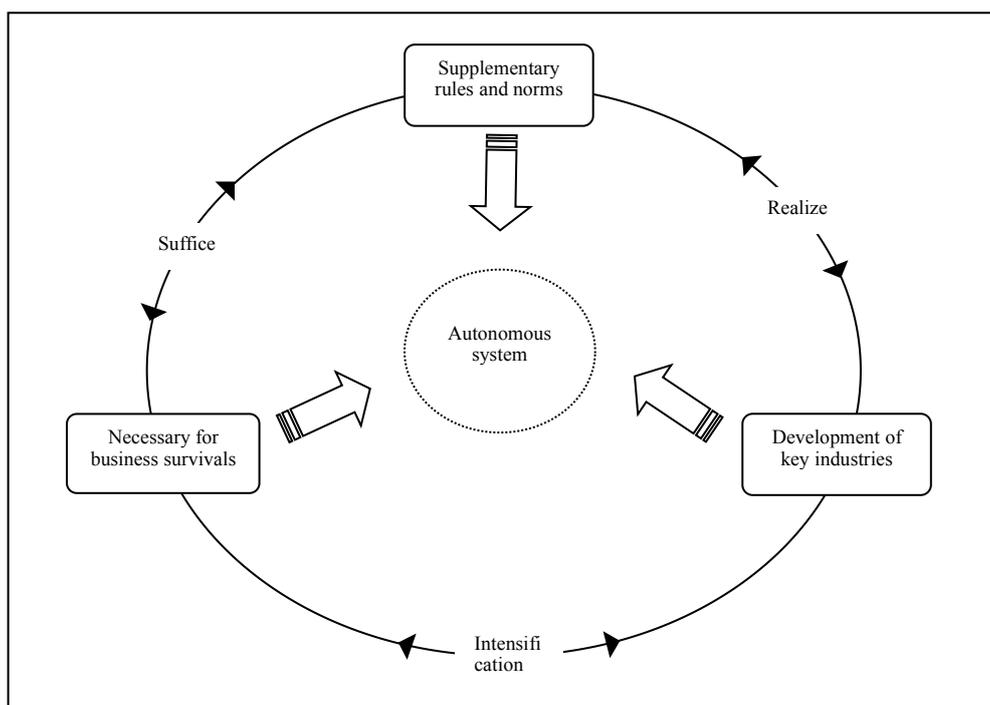


Figure 2 Union standards setting mechanisms

(II) Alliance standards have the inner motivation of voluntary participants' participating

Whether a standard can be executed does not depend on the implementation itself, and no amount of mandatory force can guarantee that all standards can get a good execution. The key that whether a standard can be effectively implemented depends on the development of standards; only when the development of standards reflects the inherent benefits of the users, can the standards be truly implemented. With regard to the essential meaning of standards, "it is a normative document that is used to get the best order within a certain range, formulated on consensus by the recognized authorities and jointly used and reused" (ISO / IEC, 1996); the standard is a voluntary choice of the members with common interests and needs, while the sole purpose of participants' developing standards is to implement standards, and the common interests of members can be achieved by implementing standards. Whether a standard can be executed does not have much correlation with the scientific nature, procedures and normalization, while interest is most closely associated with the implementation; otherwise, standards can only have futile external form, and lack the core requirements for improving the standards users' interests. China's first alliance standards for hot spring was jointly proposed and developed by Yu Hot spring Resort in Zhuhai, Guangdong Province, and the counterparts in Guizhou, Chongqing, Jiangsu, Anhui and Zhejiang provinces to change the status of emphasizing hardware but belittling service in hot spring industry. The standard meets the common interests and needs of these enterprises, so it has been implemented by the participants since formulation; in addition, more than 50 peer companies in the rest regions of China voluntarily accept the training on the Alliance Standards provided by Yu Hot spring Resort in Zhuhai, and jointly implement alliance standards for hot spring. In fact, providing the agents with appropriate and carefully constructed institutional arrangements that could protect their best interests can produce results beneficial to the best interests of all (Ostrom, 1993). As alliance standards protect the participants' inherent interests, it contributes to the implementation of standards, thereby enhancing the common interests of the alliance.

A union standard has enforcement mechanism of member self-restraint. If a standard is failed to be implemented, the common interests of all members of the alliance will be damaged, so the majority of the members have a strong motivation to enforce standards, and set constraints on other participants' implementation in the alliance. Implementation mechanisms include certification of standards implementation and identification applications, so as to achieve deterrence to the interests of the enterprises who do not perform the standards. For example, Baidu, Tencent and Kingsoft Internet constitute Security Alliance, and conduct "Security Alliance certification" for the sites applying for certification by implementing the developed internet security standards, while the sites that do not meet the certification will be banned from using the certification mark; for the sites that have obtained certification, the certification logo will be revoked once they violate the alliance standards, thus the participating companies have to strictly implement alliance standards¹ because of such constraints mechanism.

In addition to the effective implementation constraints, the more important reason for a better execution of alliance standards is that the implementation costs are cheap. Rule design needs to consider visible obedience costs, including arrangements for inspecting non-compliance and the development of penalty fees, etc. (North, 1981). The obedience costs of obeying alliance standards include supervision and inspection costs, penalties and other costs; for the alliance members, the costs of implementing such standards are quite cheap. Because all the alliance members come from the same industry, and the information among the members is relatively transparent; whether an enterprise implements alliance standards, as well as the implementation status, can be determined based on experience, while other members do not need to cost too much. Once a member is found to not implement alliance standards, it will not only lose the identity of alliance members, but may be eliminated by the market; therefore, the ones who suffer most are those members who do not perform standards. Alliance standards not only guarantee the implementation of standards for the consistency of interests; more importantly, the composition of limited members greatly reduces the uncertainty of implementation and the monitoring costs of implementation. The members of smaller collectives are equipped with motivational factors for bargaining among them (Olson, 1965). Therefore, smaller alliance can avoid "free rider" due to too many members, and the members can perform standards better to achieve orderly supply more effectively; this is the reason why the scale of the members of gas water heaters, industrial washing and other alliances is 30 or so.

Alliance standards meet the users' core interests, and achieve effective self-discipline of members; meanwhile, the costs of implementation are low, so alliance standards have voluntary participants' inherent motivation. On the one hand, while meeting the interests of users, alliance members have strong self-discipline, so that performance targets can be achieved without much implementation costs, and the users' core interests can be further strengthened; On the other hand, in order to better meet the users' interests, the alliance will be controlled at a scale for which the costs of implementation are relatively lower, so as to make it easier to achieve effective constraints of implementation, thereby enhancing the core interests of a standard users. Under the three factors of meeting the core interests, achieving self-discipline and a lower cost of implementation, a voluntary enforcement mechanism of alliance standard is formed (see Figure 3).

¹ See Security Alliance, *Security Alliance Authentication Protocol*, http://www.anquan.org/help/auth_agreement/

(III) Alliance standard building adaptive interests mechanisms to adapt to changes of industry and technology

Biological evolution is the ability to automatically adapt to changes and challenges in the external environment; biological ability to adapt to the external environment mentioned by “survival of the fittest” is the core of sustainable development. An important aspect of measuring a standard is to see that whether it can automatically adapt to changes of industry and technology. To meet this requirement, it cannot rely on external forces to promote, but rely on the self-change and self-adaptation of the members of an industry regulated by a standard. As the development of industry and technology, especially in the context that information technology and biotechnology are under rapid technological change, new features, technology and demand are emerging, which put forward higher requirements for standards in adapting themselves. As all the members of an alliance are professional enterprises from the industry, these members have the most professional understanding of the changes within the industry, and have a more accurate grasp of future technology trends; therefore, they can raise endless innovative design for the standards, and make the standards adapt to the new changes and demands of the industry. For example, Huawei, the world’s leading telecom solutions provider, could propose 11 new draft proposals for standards¹ with other members coming from other countries and regions in a conference on standards held by the World Telecommunication Union. The professional and technical capacity of alliance members is the reason why alliance standards can reflect the changes in the industry fast and flexibly; based on the professional judgment that the standards shall meet the consistency of interests, a new standard can be quickly created and the common interests and demands of the industry members can be nestled up.

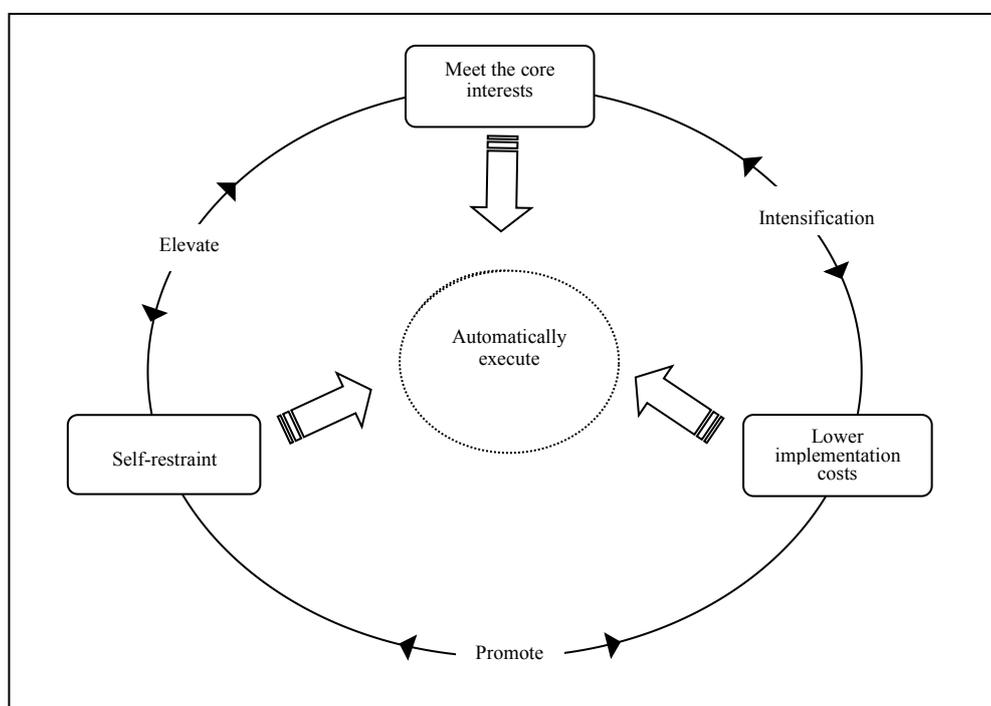


Figure 3 Union standards enforcement

In fact, whether a standard is applicable is a result of consecutive “trials and errors”, so is the case with the standards reflecting the demand for innovation. Coalition standard is the members’ voluntary choice based on common interests. The voluntary refers to that the members can choose any item of coalition standard in certain field freely, and then achieves the suitable criteria according to the competing results among various coalition standards. The non-mandatory nature of coalition standard refers to it is unnecessary to compel the enterprise related to the standard to implement. The implementation of standard is realized by depending on driving users’ interests. The most important factor for that whether the coalition standard is effective is that how many enterprises implemented the standard, not whether the standard is formulated by certain coalition, or whether the coalition standard achieves unanimous approval upon procedure. As long as the standard is implemented by more members whether it is formulated by certain organization, enterprise or individual, the coalition standard really meets the changes in industry and technology. The

¹ Data source: Official website of Huawei, *Huawei and Centillium Co-host the World Telecommunication Union Standard Conference*, <http://pr.huawei.com/cn/news/hw-087290-news.htm>

competition among coalition standards enables the members to choose more suitable standard upon comparison. In order to make much more members use the coalition standard, the constitutor shall try best to correct standard and make the standard adopt widely. The voluntary and competitiveness of coalition standard makes the standards meet industry and technology changes to survive and develop further, thus the standard will meet the requirements of industry and technology changes in practice. In fact, it is not that redwood furniture coalition standard exists in Dayong Town, Zhongshan City, so does Xinhui District, Jiangmen City, Guangdong Province and Dongyang City, Zhejiang Province. The coalition standards in different regions meet the industry and technology changes upon competition.

The reason why the coalition standard can meet and guide the changes in industry and technology is driven by interests. The interests of coalition standard are not only deflected in the improvement of industry order brought by member consistency, which also are embodied in the economic benefits brought by certain good coalition standard. A certain coalition standard condenses a mass of early technology input and accumulation of industry experience. If the coalition standard can only be adopted by other social members free or change, the constitutor of coalition standard will have no impetus to perfect and improve standard level. Only when the benefits are larger than cost, the coalition standard can better adopt the industry and technology requirements changed rapidly. For example, China Detection Institute for Special Equipment, as a professional organization¹ providing detection service for devices and equipment engaged in petrochemical industry, has developed a set of advanced inspection and detection certification standard based on its own experience and technology development. Because the standard is favored by CNPC and Sinopec, as well as other potential users, China Detection Institute for Special Equipment is encouraged to develop and invest the standard, and takes the “standard supplier” as the future strategic positioning. The reason for such positioning is that the standard will bring continuous economic interests back to China Detection Institute for Special Equipment. If the coalition standard wants to meet and guide the innovation in industry and technology, the maximum motivation is from the direct interests. In order to achieve continuous interests, the constitutor will positively to develop the standard leaning industry and technology innovation.

Therefore, the coalition standard is formulated based on profession evaluation. The constitutor of excellent standards will achieve abundant economic returns through surviving of the fittest, in order to meet the changes in industry and technology. The self-adaptation shows that the coalition enterprise reflects the latest innovation results in standard taking its advantages in technology and experience, in order to own better

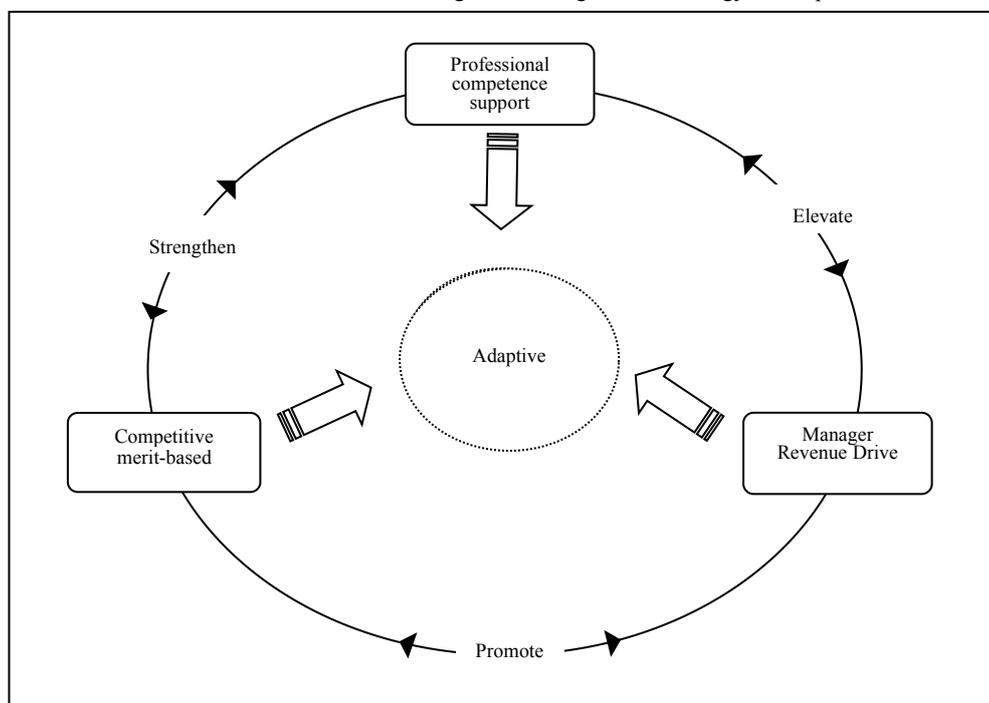


Figure 4 Union standards adaptive

competitive advantages, make constitutor achieve more economic benefits and promote professional capacity further. At the same time, the coalition

¹ Data source: Petrochemical Inspection and Maintenance Technology Center, China Special Equipment Inspection Institute <http://pcir.csei.org.cn/aboutRPPI.jsp?name=zhongxin>

standards meeting industry and technology changes fiercely compete with each other under the background pursuing continuous economic benefits, making the members to promote their technology ability and formulate the standards meeting market requirements. Under the three functions of support by professional ability, similar competition and selection and economic benefits drive, the coalition standard shall continue to meet the requirements of industry and technology changes and form the self-adaptation mechanism of coalition standard (as shown in figure 4).

To sum up, the operative power for coalition standard, whether formulating mechanism, implementation mechanism or self-adaptation mechanism, is sourced from interest requirements and realize the high consistency between standard constitutor and user. Therefore, the interest consistency refers to that the market and society (users of standard) independently formulate the standard meeting users' interests, in order to achieve the purpose of voluntary implementation. It takes the self-adaptation as the core and meets the changes in industry and technology, in order to realize the interests of constitutor and user at highest level. Specifically speaking, the standard is the immediate response using mechanism under the motivation of self-adaptation mechanism, and it will promote the constitutor to formulate much more standards meeting users' interests upon the voluntary implementations of members. In addition, if there are problems inconsistent with benefits during the process of voluntary implementations, the users can feed back and adjust through self-adaptation mechanism, and embody the matters in the new round of standard. Therefore, under the mutual functions of independent formulation, independent implementation and self-adaptation, if the internal interest consistency is realized, it can be expanded to the standard theory framework (as shown in figure 5).

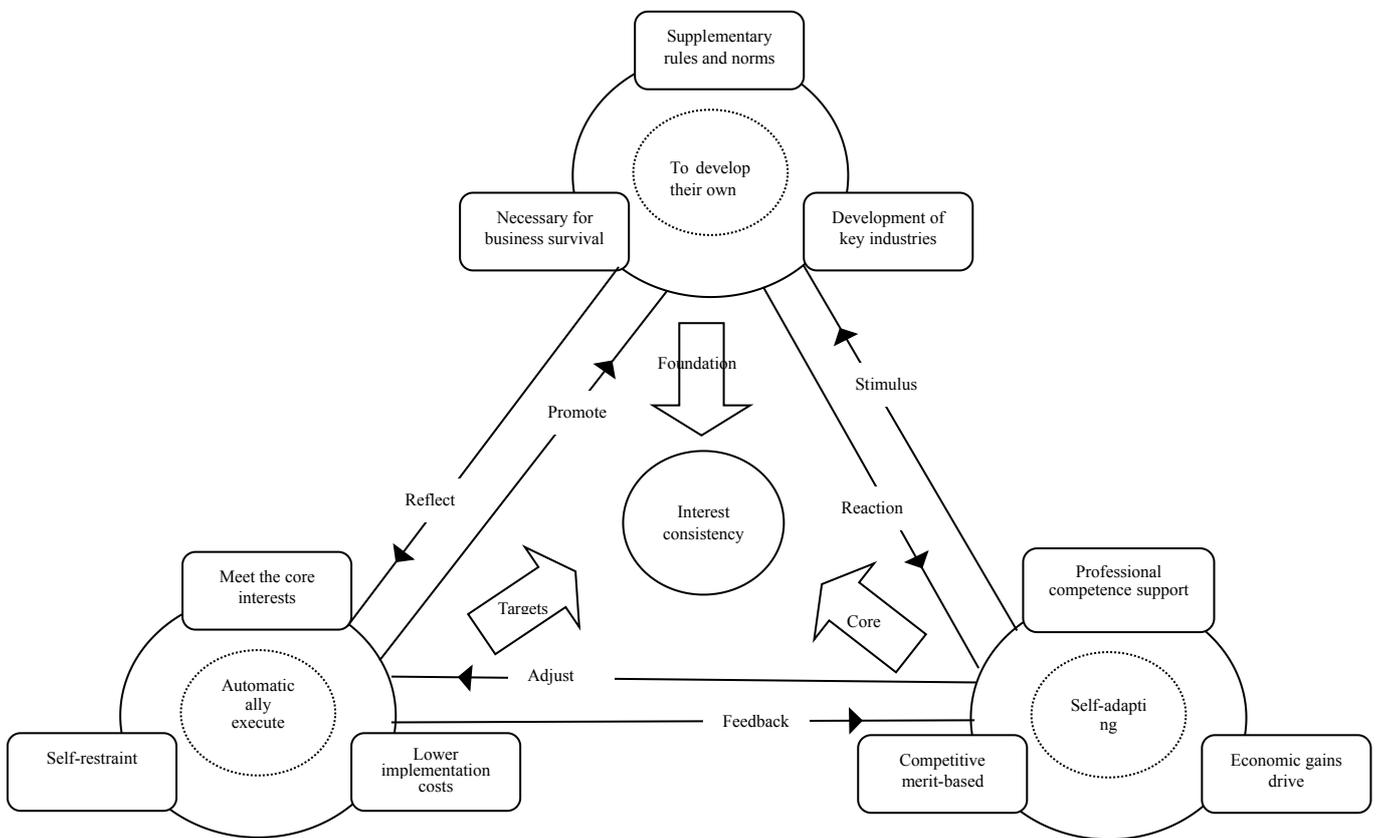


Figure 5 Standard theoretical framework of interest consistency

IV. Conflict of interest of China's current standard system

Chinese existing standard systems are managed by government in essence, where mandatory standards, voluntary standards, national standards, industrial standards and local standards. In addition to enterprise standards, all standards shall be organized by government organization. Even though the enterprises standards (mainly product standards), they shall be reported to government standardization competent department and relevant administrative departments for record¹ according to the relevant regulations. It means that the standard management by government shall assume various functions of standard and meet the requirements of relevant interest parties. However, the government shall not achieve so complex interest requirements. In fact, the standard management system led by government is hard to embody the mandatory interest requirements of government on standard, and it also controls the diversified demands of other parties on standard interests. According to the general theoretical framework of coalition standard, we shall study the interest conflicts of China standard system below.

(I) Compulsory and voluntary conflicts of interest

As the formal representative of society, the government owns the mandatory public power recognized by the society, so the formulated standards shall be limited within mandatory range. China definitely promised that “Chinese mandatory standard equals to technology regulation”² upon joining WTO. Consistent with the enforceability of government public power, the government standards with legal characteristics shall be implemented compulsorily. However, during the process of formulating standards in reality, the government with public power shall not only formulate mandatory standards, but also voluntary standards³. It makes the government traps into a dilemma also the constitutor and user. At the same time, it also makes the government doubt its own responsibility in standard formulation, and then triggers the criticism of society on government: on one hand, attribute the fields with new industries and technologies while without standards to the government failing to formulating mandatory standards; on the other hand, it will claim the government intervening with the fields governed by market and society. Many problems related to standard system are from the generalization of government positioning. It seems that the government is omnipresent, but in fact, the government does not manage the focused mandatory standards better, and limit the society’s supply to voluntary standard.

Mandatory standard means necessary implementation, while voluntary standard means optional implementation; therefore the two standards are totally different in standard positioning. As for the society, it shall pay much attention to the public, fundamental and general fields of safety, health and environmental protection. If the mandatory standards are formulated in above fields, it can guarantee the basic orders of market and society, and reduce the cost of social transaction, so developed countries have the technology regulations similar to Chinese mandatory standards. As analyzed in above text, massive fields are located in exploration and practice in innovation. The government has no energy and ability in standard governance. Therefore, it can choose preferable standard through the competition among various voluntary standards. In fact, as a kind of public service provided to society, the government standards can be provided by the market by means of government purchasing. It shall take advantage of market competition to reduce service cost and improve service quality (Luoying, 2012). On the contrary, the government dominates the formulation of voluntary standards and monopolizes the standard setting in the fields where the market and society shall play functions. The reason for voluntary is not non-implementation, but various parallel standards exist in voluntary field based on the diversified requirements of market and society. There is no single evaluation for the merit and adaptability. It shall produce general standards through exploration. The government’s management on voluntary standard is not conducive to implementation and innovation of standards. More seriously, because the government’s power is broad in standard fields, some social subjects will promote the government to formulate the standards favorable to self interests, in order to take advantage of government’s power to restrain competitors, thus the standard fields’ produces unfair competition. This makes the standard formulated by government deviates from its original meaning, and it will become the product of interest game (Li Han, 2013).

(II) Conflict of interest between stability and change

The purpose of standard is to achieve best order within certain range. Especially, the standards formulated by government are rule of orders implemented by the whole society. Therefore, in order to achieve best order in the whole society, it shall input much more resources and operation cost than small-range orders. Considering from this aspects, the government standard shall keep certain stability, to try to standardize the public field

1 See Article 6 of Chapter II in *Standardization Law of the People’s Republic of China*: “Where, in the absence of both national and trade standards for products manufactured by an enterprise, standards for the enterprise shall be formulated to serve as the criteria for the organization of production”. An enterprise’s standards for its products shall be reported to the standardization administration department and the competent administrative authorities under the local government for the record. Article 5 of Chapter I; Competent administrative authorities under the governments of provinces, autonomous regions and municipalities directly under the Central Government shall, in line with their respective functions, be in charge of standardization in their respective departments and trades within their respective administrative areas.

2 Data source: *Provisions on Mandatory Implementation of Compulsory Standards* (NO [2000]36) issued by Chinese National Administration of Quality and Technology Supervision.

3 See Article 6 of Chapter II in *Standardization Law of the People’s Republic of China*: “National standards shall be formulated by the department of standardization administration under the State Council. Trade standards shall be formulated by competent administrative authorities under the State Council”; Article 7: “National standards and trade standards shall be classified into compulsory standards and recommended standards.” Those for safeguarding human health and ensuring the safety of the person and of property and those for compulsory execution as prescribed by the laws and administrative rules and regulations shall be compulsory standards, the others shall be voluntary standards; Article 14 of Chapter III: “The state encourages enterprises to adopt voluntarily recommended standard”. Hence, though recommended standards are formulated by the government, they are made voluntarily. In order to maintain the consistency of the narrative, here they are collectively referred to as voluntary standards.

effectively. In addition, the standards formulated by government are based on long-term experience, which are the general regulations accepted by the majority. The standard owns better stability and provides better expectation for the market and society due to mature contents and wide acceptance, making each subject constrained by government standard takes its own action and selection in a relatively stable environment.

Besides the social stable orders standardized by government standard, massive fields shall build orders with variation. As for such fields, new industry requirements and technology changes are the important factor for the development of market and society. Therefore, the standard shall have the corresponding flexibility and variability upon implementation. Because the fields have no orders accepted widely or the existing orders can not reflect the new interest requirements of industry members, it shall have different market and social subjects to formulate the competitive standards. The acceptable and desirable regulations will be formed through continuous “trial and error” and optimization (Liao Li, 2013). In fact, the standards formed through flexible variations will become the source of government standards. For example, according to Management and Budget Office A-119 Report in 1993 and “national technology transfer and promotion act” in 1996, it specifies that the federal government regulation and purchasing shall depend on voluntary standards, so 3579 voluntary standards have replaced government special standards (Donaldson& Rioux, 2012) from 1998 to 2012; in the fiscal year of 2012, America Federal Agency adopted 423 voluntary standards, 1 times higher than that in 2011 (Rioux, 2013).

In contract, Chinese existing standards have fierce interest conflicts in stability and changes. The most common situation is the judgment on “standard period”. Standard period refers to the term when the standard formulated by government is not modified. What Chinese standards are criticized is that the standard period is too long. Especially, during the early stage of “11th five-year plan”, the average standard period is 10.2 years and the standard revision period is 4.5 years. Although the average standard period has been shortened to five years and the average revision period has been shortened to three years¹, the society also holds that the standard is slow in updating speed and long in formulation period, so it can not meet the fast-changing social and economic development. In fact, the criticism confuses the differences between government standards and social standards. The government standard is the expression of stable orders recognized by society, whose internal stability requires longer standard period. The short standard period indicates the government standard is immature or the revision is arbitrary. The fundamental reason for above criticism is that the China standard system confuses government standards and social standards. The government standard shall not meet the requirements of stability, but also meet the interest requirements of society and market through fast changes. The stability and variability is opposite in fact. Standard instability fails to form general social orders; standard invariability fails to meet the requirements of new orders. The interest requirements of the pair of conflicts can not be met by government simultaneously. The fundamental requirement of government is stability, but the variability can only be realized by market and society.

(III) Conflict of interest between development and implementation

The purpose of standard setting is implementation. As for Chinese existing standard system, the government is all-encompassing, influencing the realization of standard implementation. National standards, industrial standards and local standards are formulated by the State Council administration, relevant administrations to the State Council and local (including province, municipality, and municipality people’s government) standardization administration. The conflict and contradiction among different standards is easy to happen in the same field. Along with the penetration of industry and fusion of technology, the boundary among industries is hard to ascertain, so the standards involving multiple industries are crossed and inconsistent. In addition, whatever national standard, industrial standard or local standard, it is the standard of unified order in certain industry. Because the three kinds of government subjects represent different interests, the government standards are often repeated, crossed and contradicted, making the standard fail to implement effectively.

The conflict of more standard setting and less implementation results from the initiative selection of government standardization administrative based on maximum interests. As for the government standardization administration, it shall calculate the job based on “cost-interest”. It shall choose the key job representing the department performance during the process of standardization management according to the requirements of performance evaluation. The standard has many complex links upon implementation, so it shall need the cooperation of other departments and input much more cost in “passing the buck”. At the same time, the implementation effect of standard can not be proved by data only, thus it is hard to show the department performance in front of superior level. But the formulation of standard is not so. Generally speaking, the power of standard formulation is mastered by standardization administration mostly. In many cases, other departments and enterprises will invite standardization administration to assist, thus the standardizations administration is easy to feel sense of satisfaction. At the same time, compared to implementation, the formulation is relatively lower in cost. The output is measured by the quantity of standards. The performance can be displayed with number in the

¹ Data source: Standardization Administration of the People’s Republic of China, 2011: *12th Five-Year Plan of Standardization Career Development*.

front of superior undoubtedly. Under the background that the standard formulation is the indicator for performance, the standardization administration will formulate more standards driven by interests. Even though they know the standards will not be implemented better, they also have larger power to “produce” more standards.

V. Policy recommendations

To innovate China standard system and meet the requirements of economic society development, it shall start from the logic of internal interest consistency between constitutors and users, scientifically define the functions and locations of government in standard system, and play the full fundamental functions of market and society in standard setting and implementation.

(I) Co-construction of constitutors of government standards and social standards

The constitutors of government standards and social standards shall have its space and poisoning in standard field. The former represents the interests of government standards and the latter represents the interests of social standards. The standard system meeting the requirements of the whole society is built only through the co-construction of constitutors of government standards and social standards. What government represents is public interest, which is reflected in the fundamental and general standard requirements in safety, health and environmental protection. Because the standards issued by government are mandatory, they can only be defined in the field needing unified implementations. In addition to general and normative requirements, the government takes the standard as a kind of important public governance tool. The tool is mandatory and more flexible than law, so it can meet the requirements of governmental macroeconomic regulation and social management. What social subject represents is group interest. The group not only includes industry association and industry alliance, but also some the third party social organizations and some independent organizations serving certain industry. Because the subject can benefit from the standard, it has power to formulate the standards for the industry. The standards formulated by the above groups (including industry association, industry alliance, scientific organizations and enterprises) for multiple members are called as group standards. What group standard represents is the interest of certain group, therefore it is possible to produce various group standard in the same field. We shall further analyze that deregulate constitutors of social standards can attract more suppliers through the innovation of standard systems in fact. Through the full competition among various standard subjects, various standard meeting diversified requirements can be produced. The participation of multiple standard subjects also meets the uncertainty of standard innovation, which can produce high-level standards during the process of “trial and error” and exploration. The reform of Chinese standard systems makes the standard meet the public interests of government and diversified interests of market and society through the co-construction between constitutors of government standards and social standards.

(II) Co-governance of government standards and group standards

As a kind of governance means, the standard is ubiquitous. Therefore, the shared governance of government standards and group standards is necessary to standard governance effectively. The shared governance refers to the order that government standard governs public fields and group standard govern private fields. Public order is the field needing the government to compel and standardize. Private order is the regulations chosen by market and society upon voluntary for the sake of industry interests. Government standard refers to the enhancement in the interests of all social members in the public fields of safety, health and environmental protection. It is a kind of public institution supply in fact. Government standard not only makes the market and society own basic orders, but also largely reduces the non-standardization among market transactions, and provides specific expectations for the market and society. Due to the limitations in resource and professional ability, the government is impossible to formulate the standards meeting diversified requirements in some new industries or technology fields changing fast. The standard requirements are supplied by the diversified group standards to govern the orders beside public fields, namely, the secondary orders based on general social orders. Based on general social orders, the people require much on standards. The diversified requirements form different secondary orders and meet the interest requirements in different industry. The competition among secondary orders can not only perfect the orders, but also meet the requirements of different orders. The diversified requirements in secondary order are the existing reasons for various group standards. The coexistence of general orders and multiple secondary orders is one prominent expression for mature market and society. General orders are standardized by government standards, which place an emphasis on public fields. Secondary orders are standardized by group standards, which place an emphasis on private fields. The share governance of government standard and group standard makes the society to form secondary orders in various types based on general orders, and combine government regulation and social autonomy, in order to achieve the effective governance on market and in society.

Therefore, government standard and group standard are the most important standard in China.

(III) Sharing fundamental functions and innovative functions of standards

The most fundamental function of standard is to meet the general requirements of the whole society, and standardize the base line involving public interests based on the mature experience of industry development. As for the general fields related to the daily operation of society, the standards shall play the fundamental functions, in order to provide uniform and compatible specifications for the society. Because the fundamental function of standard is to standardize social basic orders, the standard shares long-term stability, and can provide stable expectation for the market and society. The standard is a kind of specification to existing orders, and also it can guide the formation of new orders. The new orders can reduce transaction cost and bring much more benefits to constitutors, so the standard plays a function in innovation. Whether the government standard is from which field, the functions are only fundamental, which can meet basic and general requirements rather than innovation requirements. The innovation is the essence in market and society, and it is the breakthrough in certain fields through the existing unique ability. Innovation is the result imputed and explored by risk lovers. Therefore, they are not obligated to transfer the innovative results to government free of charge. Conversely, innovation is often accompanied by risk. The government is possible to solidify the innovative results with risks through its own standard. Therefore, the subject of standard innovation is not government but market and society. As for the free transaction, the market will form the innovation in technology or management model into standard, and then transfer to other subjects through certification and approval, in order to achieve innovation benefits from using and authorization of standard. When more and more members are willing to use the standard with innovative functions, the government can thumb a lift from market to quote the standard under the premise no involving the knowledge property and interests of constitutor, making it become the new government standard with fundamental functions. In fact, it means that the government is dominant in public service (Osborne& Plastrik, 1998). Government standard provides fundamental function for group standard, making the group standard apply the standards with innovative functions on the basis of general orders. On the other hand, the innovative functions of group standard provide new possibility to the fundamental functions of government standard, making the fundamental functions of government standard improve and enhance continuously. A kind of sharing relation exists in both standards.

The key point for innovation in Chinese standard system is to obey the theoretical logic of standard interest consistency, establish the constitutors of different interest standards, and make the constitutors and users reach an agreement in interests. As for the diversified requirements of standard interests, it needs to establish two kinds of subjects to set up government standards and ground standards. Government standard and group standard shall be two main types, representing public interests of government and ground interests of market and society. Thus, it can establish general orders and build secondary orders meeting the self-governing of market and society. If internal interest consistency exists in the constitutors of government standards and social standards respectively, it can not only improve the enforceability, but also meet the requirements of industry changes and technology innovation. Therefore it plays the important functions of standard governance during the transformation and upgrading of Chinese economy.

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Theoretical Framework and Institutional Innovation of Standards Based on Interests Consistency:

A Case Study on Coalition Standards

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Abstract: Based on a case study of the newly emerged “coalition standards” in China, this article finds out the inherent problems of Chinese standard system and proposes a theory of interests consistency for reform. The coalition standards, a new kind of standard, are developed by members of one industry on the basis of consensus. Meeting the inner interest of its members, coalition standards can be well implemented with the latest technological innovation of industry. In this respect, the fundamental problem of existing standard system in China is lacking of interest consistency on a high level, which illustrates by three types of interest conflicts, namely mandatory vs. voluntary, stability vs. change, development vs. implementation. As such, this article suggests that it is necessary to reform the existing standard system and establish national standard system consists of government standards and group standards including coalition standards. Hence, the reformed standard system will be built by government and groups, governed by government standards and group standards, and shared by basic and innovative functions of standards.

Key Words: Interests Consistency; General Theory; Standard System; Case Study

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Implementation of Government Quality Award and its Impact on Firm Performance¹

——Based on the Survey of 424 Enterprises in Zhejiang Province

Xiong Wei, Wang Juanli

Abstract: Various regions set up Government Quality Award one after another to guide and stimulate the enterprises to strive for excellent operation quality and improve comprehensive quality and competitive capacity of enterprises. However, the impact of evaluation criteria of Government Quality Award on enterprise performance still needs to be verified. The paper extracts 424 enterprises in Zhejiang as a sample to study the impact of evaluation criteria of Government Quality Award on enterprise performance, and specify the functions of Government Quality Award as well as the channels and degree. The study shows that the effect of Government Quality Award on large enterprises is more significant than SMEs. The elements of evaluation criteria are shown as follows (the order is from significant effect to small effect): process control, technology capacity, knowledge management, customer relationship management, human resource management, leadership, strategy planning, social responsibility, enterprise culture. Meanwhile, on this basis put forward policy recommendations.

Key words: Government Quality Award (GQA); Firm Performance; Impact

I. Introduction

Government Quality Award is the award granted by the state, province, city and district (county) in the name of government or head of government. Supported by government finance and based on the objective, public and fair principles and stipulated procedures, the award is mainly used to commend the organizations or individuals achieving remarkable and comparable achievements during quality management activity, in order to promote the enterprise or individual to concern and protect the interests of consumers, staff, shareholders, suppliers, partners, government, communities, etc.

Government Quality Award and its effect on enterprise performance had received wide concern from educational circles since 2001. Zhang Dongfeng etc (2004) pointed that when introducing the implementations of America State Quality Award, 79% enterprises hold that America State Quality Award and its criteria stimulate the improvement of enterprise quality to a large extent; 67% enterprises hold that the award stimulates enterprise competitiveness to a great degree. Li Jun (2004) compared and analyzed the quality awards with powerful influence in the world from two dimensions of investigation projects and internal framework – Deming Prize, Baldrige Award and European Quality Award. He reached the conclusion that China shall not only learn from world advanced awards in theory and system, but also perfect and build state quality awards with Chinese characteristics in practice. Li Ting (2006) compared and analyzed America and Japan State Quality Award from the perspective of culture, holding that the deep reasons for differences are historical background, enterprise culture and enterprise quality culture. Gu Yanhui, etc (2008) summarized the evaluation criteria of Deming Quality Award, Baldrige Quality Award, European Quality Award and China Quality Management Award, compared them with ISO9000 evaluation criteria in 2000 and discussed their differences. Li Zhao etc (2010) analyzed the changing and development tendency of evaluation criteria from 1988 to 2008, application number and application type for America Government Quality Award and Baldrige Quality Award, in order to provide reference to strengthen quality macro management. Lv Qing, etc. (2012) introduced the latest implementations of America Baldrige Quality Award, EFQM Excellent Award (original European Quality Award) and Japan Deming Prize, and summarized the development tendency of government quality awards on the basis of analyzing the evaluation criteria. The literatures cover and analyze Government Quality Award from multiple perspectives. At present, there is no study on the effect of Government Quality Award on enterprise performance.

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In order to guide and stimulate the enterprise for excellent operation quality, promote the comprehensive quality and competition capacity of enterprises and advance the undertaking of “quality power/quality province/quality city/quality county”, “China Quality Award” and government quality awards were issued successively. Various cities and counties (districts) set up government quality awards one after another. The activity of quality awards becomes a hot trend in China. However, the following issues shall to be studied further: whether Government Quality Award is favorable to enterprise; how the elements influence enterprise performance; what is the influence channel and degree; whether the environmental dynamic adjust the influence of quality award on enterprise performance.

The paper surveyed 424 enterprises in China randomly. Based on this point, we investigated and analyzed the implementations of quality awards in Zhejiang using SPSS and other statistical analysis software, studied the impact of evaluation criteria (leadership, strategy, market, resource, process and measurement) of Government Quality Award on enterprise performance, specified the effect of Government Quality Award on enterprise as well as function channel and degree, in order to provide the basis for government decision.

II. Zhejiang Provincial Government Quality Award Implementation Analysis

The paper describes the current implementations of Government Quality Award in Zhejiang province, such as: the regional distribution and industrial distribution in Zhejiang Province according to different regions and industries; the implementations of Government Quality Award in Zhejiang Province according to different company types and scales, etc.

(I) The regional differences of Government Quality Award implementation in Zhejiang province.

The survey involves 424 questionnaires, including 35 copies from Hangzhou, 76 copies from Ningbo, 22 copies from Wenzhou, 47 copies from Jiaxing, 60 copies from Huzhou, 72 copies from Shaoxing, 39 copies from Jinhua, 11 copies from Quzhou, 21 copies from Zhoushan, 25 copies from Taizhou and 16 copies from Lishui.

Table 1 Summary of time when prefecture-level cities in Zhejiang Province import excellent performance

Administrative region	Before 2003	2003	2004	2005	2006	2007	2008	2009	2010	2011	Not imported	Sample summary
330100	3	0	0	4	4	7	8	2	7	0	1	35
330200	1	2	9	15	8	13	14	8	3	0	2	76
330300	1	0	0	5	2	2	2	3	4	0	3	22
330400	1	0	0	2	1	9	21	9	4	0	0	47
330500	0	0	0	1	0	2	8	6	35	0	8	60
330600	1	3	6	11	8	13	14	6	10	0	0	72
330700	0	1	0	2	4	1	5	8	10	1	7	39
330800	2	0	0	1	0	4	1	2	0	0	1	11
330900	0	0	0	0	1	1	3	6	9	0	1	21
331000	1	1	0	0	5	4	2	6	6	0	0	25
331100	0	0	0	3	0	0	3	4	0	0	6	16
Total	10	7	15	44	33	56	81	60	88	1	29	424

Note: Among: Hangzhou city 330100, Ningbo city 330200, Wenzhou city 330300, Jiaxing city 330400, Huzhou city 330500, Shaoxing city 330600, Jinhua city 330700, Quzhou city 330800, Zhoushan city 330900, Taizhou city 331000, Lishui city 331100. The same below.

Table 2 Summary of award levels of sample enterprises from prefecture-level cities in Zhejiang Province

Administrative region	0	1	2	3	4	Provincial or above awards / Importing the number of enterprises	Sample summary
330100	25	10	0	0	0	0	35
330200	6	61	5	1	3	4:74	76
330300	9	3	3	4	3	7:19	22
330400	18	19	7	3	0	3:47	47
330500	52	2	4	2	0	2:52	60
330600	1	56	9	6	0	6:72	72
330700	19	6	12	1	1	2:32	39
330800	2	0	5	4	0	4:19	11

Continued Table 2

Administrative region	0	1	2	3	4	Provincial or above awards / Importing the number of enterprises	Sample summary
330900	13	5	3	0	0	0	21
331000	19	2	2	2	0	2:25	25
331100	10	0	5	1	0	1:10	16
Total	174	164	55	24	7	31:395	35

Note: 0 indicates that the sample enterprises have not achieved quality awards at any level; 1 indicates the sample enterprises have achieved county-level quality award; 2 indicates that the same enterprises have achieved prefecture-level city quality award; 3 indicates the sample enterprises have achieved provincial quality award; 4 indicates that the sample enterprises have achieved provincial Government Quality Award or national quality award. The same below.

From table 1 and 2, we can know that various regions are different in promoting quality awards. The sample enterprises in Hanzhou imported Government Quality Award from 2005 to 2010; the sample enterprises in Ningbo mainly imported Government Quality Award between 2005 and 2009; Wenzhou, Jiaxing and Shaoxing promoted Government Quality Award from 2005 to 2010; Huzhou promoted excellent performance in past three years; the intensity of promoting excellent performance in Quzhou, Zhoushan and Lishui shall to be further strengthened. As for the 424 samples, 29 enterprises are not involved in Government Quality Award until survey date, while the importing rate of excellent performance is 93.16%; 174 enterprises have not achieved quality awards at all levels, accounting for 41.04% of sample enterprises; 164 enterprises have achieved provincial-level quality awards, accounting for 38.68% of sample enterprises; 55 sample enterprises have achieved prefecture-level quality awards, accounting for 12.97% of sample enterprises; only 7 enterprises have achieved provincial Government Quality Award or national quality award. Table 2 shows that as for the seven enterprises achieving provincial Government Quality Award or national quality award, 6 enterprises are from Ningbo and Wenzhou. As for 24 enterprises achieving provincial quality award, 4 enterprises are from Wenzhou, 3 from Jiaxing, 6 from Shaoxing and 4 from Quzhou. The enterprises from Hanzhou and Zhoushan shall strengthen to promote quality awards above provincial level.

(II) Industry differences of Government Quality Award implementation in Zhejiang province.

Table 3 Industry differences of Government Quality Award implementation in Zhejiang province.

Industry Code	0	1	2	3	4	Before the year of	2004~2008	2009~2011	Industry summary
13	13	4	2	0	0	0	7	10	19
14	2	0	2	0	0	0	2	2	4
15	4	5	1	0	0	1	5	4	10
17	9	19	2	3	0	1	21	10	33
18	5	2	3	2	2	2	5	6	14
19	5	0	2	2	1	1	7	2	10
20	8	2	3	1	0	0	7	6	14
21	13	1	0	0	0	1	2	11	14
22	2	5	2	0	0	0	6	3	9
23	2	0	0	0	0	0	2	0	2
24	2	3	0	0	0	0	3	2	5
26	5	9	1	3	0	2	9	6	18
27	5	3	0	1	0	1	1	7	9
28	2	4	2	0	0	1	4	3	8
29	0	2	0	0	0	0	1	1	2
30	3	7	1	1	0	0	8	4	12
31	6	2	1	1	0	0	5	4	10
32	6	1	0	0	0	0	1	2	7
33	4	8	2	0	0	0	8	5	14
34	6	8	4	0	0	0	7	9	18
35	15	21	2	1	0	2	22	14	39

Continued Table 2

Industry Code	0	1	2	3	4	Before the year of	2004~2008	2009~2011	Industry summary
36	9	3	2	1	0	1	6	7	15
37	16	14	9	4	0	1	24	13	43
39	23	31	8	2	3	2	42	17	67
40	3	5	2	0	0	0	8	2	10
41	3	0	0	1	0	0	3	0	4
42	0	5	3	1	0	0	9	0	9
44	1	0	0	0	0	0	0	0	1
47	0	0	1	0	1	1	1	0	2
51	1	0	0	0	0	0	1	0	1
65	1	0	0	0	0	0	0	1	1
Summary	174	164	55	24	7	17	227	151	424

Note: Abstract first two digits of the industrial code. 13 stands for the food and non-staple food processing industry, 14 for food manufacturing industry, 15 for beverage manufacturing industry, 17 for textile industry, 18 represents textile costume, shoe and hat manufacturing industry, 19 for leather, fur, feather (down feather) and relevant product industry, 20 for wood processing, and wood, bamboo, vine, palm and grass product industry, 21 for furniture manufacturing industry, 22 for papermaking and paper products industry, 23 for printing industry and recording media copying, 24 for cultural education and sports articles manufacturing industry, 26 for chemical raw materials and chemical product manufacturing industry, 27 for pharmaceutical industry, 28 for chemical fiber manufacturing industry, 29 for rubber manufacturing industry, 30 for plastic product manufacturing industry, 31 for non-metallic mineral product industry, 32 for ferrous metal smelting, 33 for nonferrous metal smelting and pressing industry, 34 for metallic product industry, 35 for general equipment manufacturing industry, 36 for dedicated equipment manufacturing industry, 37 for transport equipment manufacturing industry, 39 for electric machinery and apparatus manufacturing industry, 40 for communication device, computer and other electronic equipment manufacturing industry, 41 for instrument, meter and cultural and office machinery manufacturing industry, 42 for artifact and relevant manufacturing industry, 44 for electric power and thermal power production and supply industry, 47 for houses and civil engineering construction industry, 51 for railway transport industry, and 65 for retail industry.

Table 3 shows that the survey involves 33 categories, including 28 categories of manufacturing industry. The industry whose survey sample is more than 10 includes: farm and sideline food processing industry (18), beverage manufacturing industry (10), textile industry (33), textile and garment, shoes, caps manufacturing industry (14), leather, fur, and feathers (fine hair) and its products (10), wood processing and wood, bamboo, cane, palm, grass products (14), chemical raw materials and chemical products manufacturing industry (18), plastic products industry (12), non-metallic mineral products industry (10), non-ferrous metal smelting and rolling processing industry (14), metal products industry (18), general equipment manufacturing industry (39), special equipment manufacturing industry (15), transportation equipment manufacturing industry (43), electrical machinery and equipment manufacturing industry (66), communication equipment, computers and other electronic equipment manufacturing industry (10). 2 enterprises in textile and garment, shoes, caps manufacturing industry have achieved provincial or national quality award; 1 enterprise in leather, fur, and feathers (fine hair) and its products has achieved provincial government or national quality award; 3 enterprises in electrical machinery and equipment manufacturing industry have achieved provincial government or national quality award.

(III) Industry differences of Government Quality Award implementation in Zhejiang province.

According to the types of business, the survey involves seven types, which are state-owned, or state-owned holding enterprise, collectively-owned enterprise, private enterprise, shareholding system enterprise, foreign investment enterprise, Hong Kong, Macao and Taiwan investment enterprise.

Table 4 Industry differences of Government Quality Award implementation in Zhejiang province.

Enterprise type	Award-winning enterprise level					Transverse summary
	0	1	2	3	4	
1	7	4	4	2	0	17
2	4	1	1	0	0	6
3	80	71	18	6	2	177
4	58	56	24	13	5	156
5	6	13	2	1	0	22
6	8	12	1	0	0	21
7	11	7	5	2	0	25
Longitudinal summary	174	164	55	24	7	424

Note: 1 indicates state-owned or state-owned holding enterprise; 2 indicates collectively-owned enterprise; 3 indicates private enterprise; 4 indicates shareholding system enterprise; 5 indicates foreign investment enterprise; 6 indicates Hong Kong, Macao and Taiwan investment enterprise; 7 indicates other types.

Table 4 shows that as for 17 state-owned enterprises, 2 enterprises have achieved provincial quality award, 4 enterprises have achieved prefecture-level quality award, 4 enterprises have achieved district-level quality award; as for 6 collectively-owned enterprises, 1 enterprise has achieved prefecture-level quality award and district-level quality award respectively; as for 177 private enterprises, 97 enterprises have achieved awards, where 8 enterprises have achieved quality awards above provincial level; as for 156 shareholding system enterprises, 98 enterprises have achieved awards, where 18 enterprises have achieved quality awards above provincial level; as for 22 foreign investment enterprises, only 1 enterprise has achieved quality award above provincial level; and also only 1 enterprise has achieved prefecture-level quality award. These data shows that private enterprises and shareholding system enterprises are the main force promoting excellent performance; state-owned enterprises, collectively-owned enterprises and foreign investment enterprises have actively imported excellent performance to promote operation performance.

(IV) Industry differences of Government Quality Award implementation in Zhejiang province.

The survey delimits enterprise scale according to the number of employees in the end of 2012. The enterprises are divided into small enterprises (0-300), medium-sized enterprises (301-1000), lager enterprises (1001-5000) and super-large enterprises (5001 and above).

Table 5 Industry differences of Government Quality Award implementation in Zhejiang province.

Firm Scale	Award-winning enterprise level					Summary
	0	1	2	3	4	
0 to 300 people	56	20	2	0	0	78
301 to 1000 people	72	73	16	9	1	171
1001 to 5000 people	44	65	30	9	2	150
5000 people and more	2	6	7	6	4	25

Table 5 shows that as for the sample enterprises implementing Government Quality Award, there are 78 small enterprises, 171 medium-sized enterprises, 150 lager enterprises and 25 super-large enterprises. As for the enterprises achieving provincial-level quality award and above, the enterprise scale is more than 300; as for the enterprises achieving prefecture-level quality award, 53 enterprises are above medium size; as for the enterprises achieving district-level quality award, 144 enterprises are above medium size. It shows that middle-sized enterprise owns abundant resources and achieves excellent performance during the process of promoting government quality award. The government shall encourage SMEs to promote government quality award.

III. The impact mechanism of Government Quality Award on firm performance

The paper uses SPSS and other statistical software to analyze the distribution, reliability and validity. Based on the point, the paper uses variance analysis and regression analysis to conduct statistical analysis on effective questionnaires. The paper tentatively applies hierarchical regression method to the impact study of Government Quality Award on enterprise performance, constructs the impact model, tests the direct function of excellent performance model enterprise performance and transformation and upgrading, as well as the adjusting function of environmental dynamics.

(I) Descriptive statistical analysis of survey data

We shall state the samples before conducting empirical study using samples. First, describe the basic information of the persons under investigation.

Table 6 Descriptive statistical analysis of enterprise samples

Feature	Enterprise sample characteristics	Frequency	Percent	Cumulative percentage
	Distributional characteristics			
	13 Represents the agro-food processing industry	19	4.49%	4.72%
	14 Represents food industry	4	0.94%	5.42%
	15 Represents beverage manufacturing	10	2.36%	7.78%
	17 Stands for textile industry	33	7.78%	15.57%
	18 Represents textile and garment, shoes, hat manufacturing	14	3.30%	18.87%
	19 Indicates leather, fur, and feathers (fine hair) and its products	10	2.36%	21.23%
	20 Wood processing and wood, bamboo, cane, palm, grass products	14	3.30%	24.53%
	21 Furniture manufacturing industry	14	3.30%	27.83%
	22 Paper making and paper products industry	9	2.12%	29.95%
	23 Printing and reproduction of recorded media	2	0.47%	30.42%
	24 Stationery and sporting goods manufacturing industry	5	1.18%	31.60%

Continued Table 6

Enterprise sample characteristics		Frequency	Percent	Cumulative percentage
Feature	Distributional characteristics			
	26 Chemical materials and chemical products manufacturing	18	4.25%	35.85%
	27 Pharmaceutical manufacturing industry	9	2.12%	37.97%
	28 Manufacture of chemical fibers	8	1.89%	39.86%
	29 Rubber	2	0.47%	40.33%
	30 Plastic products industry	12	2.83%	43.16%
	31 Non-metallic mineral products industry	10	2.36%	45.52%
	32 Ferrous metal smelting and rolling processing industry	7	1.65%	47.17%
	33 Non-ferrous metal smelting and rolling processing industry	14	3.30%	50.47%
	34 Metal products industry	18	4.25%	54.72%
	35 General equipment manufacturing	39	9.20%	63.92%
	36 Special equipment manufacturing	15	3.54%	67.45%
	37 Transportation equipment manufacturing	43	10.14%	77.59%
	39 Electrical machinery and equipment manufacturing	67	15.81%	93.64%
	40 Communication equipment, computers and other electronic	10	2.36%	95.75%
	41 Instrumentation and culture, office machinery manufacturing	4	0.94%	96.70%
	42 Crafts and manufacturing,	9	2.12%	98.82%
	44 Electricity, heat production and supply industry	1	0.24%	99.06%
	47 Buildings and civil engineering construction industry	2	0.47%	99.53%
	51 Railway transport industry	1	0.24%	99.76%
	65 Retailing industry	1	0.24%	100.00%
Administrative region	Hangzhou city	35	8.25%	8.25%
	Ningbo city	76	17.92%	26.18%
	Wenzhou city	22	5.19%	31.37%
	Jiaxing city	47	11.08%	42.45%
	Huzhou City	60	14.15%	56.60%
	Shaoxing city	72	16.98%	73.58%
	Jinhua City	39	9.20%	82.78%
	Quzhou city	11	2.59%	85.38%
	Zhoushan city	21	4.95%	90.33%
	Taizhou City	25	5.90%	96.23%
	Li Shui City	16	3.77%	100.00%
Nature of the enterprise	State-owned or state-controlled enterprises	17	4.01%	4.01%
	Group enterprise	6	1.42%	5.42%
	Private enterprise	177	41.75%	47.17%
	Corporate enterprise	156	36.79%	83.96%
	Foreign-invested enterprises	22	5.19%	89.15%
	Hong Kong, Macao and Taiwan-invested enterprises	21	4.95%	94.10%
	Others	25	5.90%	100.00%
Firm Scale	Small business (0 ~ 300 people)	78	18.40%	18.40%
	Medium-sized (301 to 1000 people)	171	40.33%	58.73%
	Large enterprises (1001 to 5000 people)	150	35.38%	94.10%
	Ultra-large enterprises (5000 ~)	25	5.90%	100.00%

Table 6 shows that the survey is focused on manufacturing enterprises, where farm and sideline food processing industry, textile industry, general equipment manufacturing industry, transportation equipment manufacturing industry, electrical machinery and equipment manufacturing industry are dominant; as for the survey sample, the proportion in Ningbo, Jiangxing, Huzhou and Shaoxing is more than 10%; the survey is mainly focused on private enterprises and shareholding system enterprises, whose proportion is about 78.74%. Seeing from enterprise scale, the medium-sized enterprises and large enterprises account for 75.71%.

(II) The reliability and validity of investigation on Government Quality Award

The paper conducts internal consistency analysis on main scales using SPSS software, and uses reliability coefficient Cronbach's Alpha to balance the consistency of measuring items under the same concept. As for reliability coefficient, the paper tests the reliability of excellent performance and enterprise performance.

Table 7 descriptive statistical analysis of samples

Measured variable	Measurement index	CITC	Delete the value after the questions	Cronbach values
Leadership	Leadership 1	0.572	0.751	0.780
	Leadership 2	0.641	0.677	
	Leadership 3	0.644	0.673	
Enterprise culture	Enterprise culture 1	0.574	0.757	0.783
	Enterprise culture 2	0.693	0.628	
	Enterprise culture 3	0.600	0.729	
Social responsibility	Social responsibility 1	0.697	0.848	0.871
	Social responsibility 2	0.760	0.821	
	Social responsibility 3	0.765	0.818	
	Social responsibility 4	0.692	0.851	
Strategic planning	Strategic planning 1	0.744	0.871	0.894
	Strategic planning 2	0.812	0.847	
	Strategic planning 3	0.780	0.858	
	Strategic planning 4	0.731	0.878	
Customer relationship management	Customer relationship management 1	0.671	0.843	0.867
	Customer Relationship Management 2	0.658	0.847	
	Customer relationship management 3	0.697	0.836	
	Customer relationship management 4	0.707	0.834	
	Customer relationship management 5	0.714	0.833	
Human resources	Human resources 1	0.670	0.827	0.857
	Human resources 2	0.669	0.828	
	Human resources 3	0.724	0.813	
	Human resources 4	0.649	0.833	
	Human resources 5	0.646	0.834	
Process control	Process control 1	0.673	0.857	0.875
	Process control 2	0.697	0.851	
	Process control 3	0.721	0.845	
	Process control 4	0.721	0.845	
	Process control 5	0.712	0.847	
Knowledge management	Knowledge management 1	0.730	0.775	0.848
	Knowledge management 2	0.717	0.791	
	Knowledge management 3	0.706	0.797	

Continued Table 7

Measured variable	Measurement index	CITC	Delete the value after the questions	Cronbach values
Technical capabilities	Technical capabilities 1	0.662	0.883	0.894
	Technical capabilities: 2	0.743	0.873	
	Technical capabilities 3	0.577	0.894	
	Technical capabilities 4	0.768	0.870	
	Technical capabilities 5	0.720	0.876	
	Technical capabilities 6	0.726	0.875	
	Technical capabilities 7	0.689	0.879	
Organizational performance	Organizational Performance 1	0.713	0.768	0.834
	Organizational Performance 2	0.696	0.782	
	Organizational Performance 3	0.637	0.805	
	Organizational Performance 4	0.638	0.803	
Transformation and upgrading	Transformation and upgrading 1	0.694	0.859	0.880
	Transformation and upgrading 2	0.738	0.849	
	Transformation and upgrading 3	0.745	0.847	
	Transformation and upgrading 4	0.765	0.842	
	Transformation and upgrading 5	0.626	0.874	
Environmental dynamism	Environment dynamism 1	0.740	0.761	0.846
	Environment dynamism 2	0.734	0.767	
	Environment dynamism 3	0.672	0.831	

Generally speaking, Cronbach α value is larger than 0.60, indicating the reliability of measurement scale is acceptable; if Cronbach α value is larger than 0.70, indicating that the scale has high reliability. The paper also uses CITC (Corrected Item-Total Correction) to correct measurement item. Lu Wendai (2002) holds that there are two criteria for reliability screening, and the item can be deleted if two criteria are effective simultaneously: one is the coefficient of total correlation after correction (the correlation coefficient between the score of each item and the remaining items), namely, CITC is less than 0.3; second is deleting the item can promote the total reliability and increase α value. Table 6 shows that the Cronbach α value of each variable is more than 0.7 and CITC value is more than 0.3, indicating the measurement scale has higher reliability.

It shall test the correlation of scales prior to factor analysis. The methods to test correlation are Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Test of Sphericity. Kaiser-Meyer-Olkin Measure of Sampling Adequacy is used to test whether the partial correlation between variables is very small, if the value is close to 1, it indicates that it is suitable for factor analysis; Test of Sphericity is used to test whether the correlation matrix is unit matrix and reflect whether the factor analysis is suitable (Lu Wendai, 2002).

Factor analysis is a kind of statistical method to determine the nature and classification of some variables, which is also one of the powerful tools to test construct validity (Kerlinger, 1986). The purpose is to concentrate data, find out the determinative elements through the correlation research related to multiple variables, and reflects the main information of original variables using few factors. The factoring method is principal component (assume the variable is a pure linear combination of factors. The factor rotation method uses Varimax, which is a kind of orthogonal rotation. The factoring eigenvalue shall be larger than 1 or based on Cartel steep order standard (Lu Wendai, 2002). The paper takes principal component analysis as element analysis, and selects factors according to questionnaire design. The factor analysis result is shown in table 7. The KMO value of each variable is larger than 0.70, which is significant at 0.05 level, indicating that it is suitable for factor analysis. The mean value of factor loading is above 0.70, indicating the scale has better convergence validity.

Table 8 Factor analysis results

Variables	Item	Factor	Notes	Variables	Item	Factor	Notes
Leadership	Leadership 1	0.661	KMO value 0.891	Knowledge management	Knowledge Management 1	0.883	KMO value 0.731
	Leadership 2	0.773			Knowledge Management 2	0.876	
	Leadership 3	0.790			Knowledge Management 3	0.870	
Enterprise culture	Enterprise culture 1	0.640		Technical capabilities	Technical capabilities 1	0.747	KMO value 0.877
	Enterprise culture 2	0.681			Technical capabilities: 2	0.810	
	Enterprise culture 3	0.671			Technical capabilities 3	0.670	
Social responsibility	Social responsibility 1	0.790			Technical capabilities: 4	0.846	
	Social responsibility 2	0.832			Technical capabilities 5	0.813	
	Social responsibility 3	0.837			Technical capabilities 6	0.822	
	Social responsibility 4	0.761			Technical capabilities 7	0.790	
Strategic planning	Strategic planning 1	0.858	Organizational performance	Organizational Performance 1	0.831	KMO value 0.769	
	Strategic planning 2	0.901		Organizational Performance 2	0.828		
	Strategic planning 3	0.881		Organizational Performance 3	0.810		
	Strategic planning 4	0.848		Organizational Performance 4	0.814		
Customer relationship management	Customer relationship management 1	0.792	KMO value 0.861	Transformation and upgrading	Transformation and upgrading 1	0.807	KMO value 0.845
	Customer relationship management 2	0.783			Transformation and upgrading 2	0.841	
	Customer relationship management 3	0.814			Transformation and upgrading 3	0.847	
	Customer relationship management 4	0.824			Transformation and upgrading 4	0.860	
	Customer relationship management 5	0.828			Transformation and upgrading 5	0.752	
Human resources	Human resources 1	0.795	KMO value 0.856	Environmental dynamism	Environment dynamism 1	0.891	KMO value 0.722
	Human resources 2	0.796			Environment dynamism 2	0.888	
	Human resources 3	0.838			Environment dynamism 3	0.849	
	Human resources 4	0.781					
	Human resources 5	0.778					
Process control	Process control 1	0.793	KMO value 0.840				
	Process control 2	0.810					
	Process control 3	0.830					
	Process control 4	0.830					
	Process control 5	0.822					

Note: use the factors whose factoring eigenvalue is larger than 1 upon Varimax.

(III) Regression analysis of impact of Government Quality Award on enterprise performance

Regression analysis is a kind of statistical method studying the correlations between random variables. The paper substitutes several variables in linear regression analysis into equation, takes the enterprise performance, transformation and upgrading as dependent variables, takes Zhejiang Government Quality Award as independent variables, take environmental dynamics as regulated variables, discusses the influence of interaction between dimension variables and environmental dynamics on enterprise performance. The regression analysis adopts four steps to test regulation effect (Jaccard&Turriei, 2003): (1) substitute each control variable into regression equation; (2) substitute three independent variables if the regression equation contains control variables; (3) substitute regulated variables if the regression equation contains control variables and independent variables; (4) substitute three interaction items if the regression equation contains control variables, independent variables and regulated variables, in

order to test the correlation between interaction variables and dependent variables. According to Aiken&West (1991) and Jaccard&Turriei (2003), the paper conducts centralization processing on all predictive variables upon testing regulation effect to reduce multiple collinearity.

1. Regression analysis of impact of Government Quality Award on enterprise performance

Table 9 is the regression analysis result of interaction of elements and environmental dynamics on enterprise performance. The VIF value of all variables is less than 2.5. According to Hair et al.(1998), the multiple collinearity of data is not significant.

Table 9 Regression analysis of interaction between Government Quality Award and environmental dynamics and enterprise performance

	Model 1		Model 2		Model 3		Model 4	
	b	β	b	β	b	β	b	β
Constant term	-0.006		-0.001		0.000		0.002	
Control variable								
Firm Scale	0.193**	0.193**	0.112*	0.112*	0.134**	0.134**	0.111**	0.112**
Enterprise type	0.038	0.038	0.012	0.012	0.006	0.006	0.010	0.010
Enterprise district	0.020	0.020	0.032	0.033	0.067	0.067	0.030	0.031
Argument								
Leadership			0.044	0.045	0.013	0.013	-0.239	-0.240
Enterprise culture			-0.068	-0.068	-0.066	-0.066	0.450	0.452
Social responsibility			-0.057	-0.057	-0.006	-0.007	0.938*	0.940*
Strategic planning			0.031	0.031	0.030	0.030	0.082	0.082
Customer relationship management			0.072	0.072	0.088	0.088	0.852	0.853
Human resources			0.071	0.072	0.007	0.007	-0.451	-0.453
Process control			0.158	0.159	0.158	0.158	1.087	1.091
Knowledge management			0.104	0.104	0.053	0.053	-0.931	-0.933
Technical capabilities:			0.156*	0.156*	0.113	0.113	0.412	0.412
Manipulating variable								
Environmental dynamism					0.293**	0.293**	2.650**	2.650**
Interaction terms								
Environmental dynamism* Leadership							0.454	0.455
Environmental dynamism * Enterprise culture							-0.855	-0.855
Environmental dynamism * Social responsibility							-1.743*	-1.751*
Environmental dynamism * Strategic planning							-0.122	-0.122
Environmental dynamism * Customer relationship							-1.469	-1.466
Environmental dynamism * Human resources							0.940	0.940
Environmental dynamism * Process control							-1.639	-1.639
Environmental dynamism * Knowledge management							1.732	1.730
Environmental dynamism * Technical capability							-0.526	-0.526
R ²	0.039		0.255		0.324		0.400	
Correction R2	0.032		0.234		0.303		0.367	
F	5.617**		11.663**		15.039**		12.067**	
ΔR^2	0.039		0.216		0.069		0.076	
ΔF	5.617		13.140**		41.542**		5.604**	
Sample number	424		424		424		424	

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$.

Step 1: import three control variables, indicating that the explanation power of control variables is smaller on enterprise performance ($R^2=0.039$); F value reaches significance level, indicating the enterprise scale is significant on dependent variable, enterprise type and district are not significant on dependent variable.

Step 2: import the components of Government Quality Award to test the construction of independent variables on dependent variables under control variables. After adding leadership, enterprise culture, social responsibility, strategy planning, customer relation management, human resources, process control, knowledge management and technical capacity, model 2 is significant ($F=11.663$, $p < 0.01$) and the explanation power to team

innovation reach 24%, which is higher than that of model 1 ($\Delta R^2=0.195$, $\Delta F=13.140$, $p<0.01$). The regression analysis results of model 2 show that among the components of government quality award, only the influence of technical capacity on enterprise performance is positive ($p<0.05$).

Step 3: Introduce manipulated variable. The regression results show that after adding environmental dynamics, model 3 is significant ($F=15.039$, $p<0.01$) and the explanation power to enterprise performance reaches 32.4%, higher than that of model 2 ($\Delta R^2=0.069$, $\Delta F=41.542$, $p<0.01$).

Step 4: introduce the interaction between regulated variables and independent variables to test the regulation function of environmental dynamics on components of excellent performance and enterprise performance. After adding interaction, model 4 is significant ($F=12.067$, $p<0.01$), whose explanation power to enterprise performance reaches 40%, higher than that of model 3 ($\Delta R^2=0.076$, $\Delta F=5.604$, $p<0.01$). The regression results show that the interaction of social responsibility and environmental dynamics is significant, and the regression coefficient of interaction is negative ($\beta=-1.751$, $p<0.05$); the regression coefficient of other interactions on enterprise performance is not significant.

2. Regression analysis of influence of Government Quality Award on transformation and upgrading

Table 10 is the regression analysis result of interaction of elements and environmental dynamics on enterprise performance. The VIF value of all variables is less than 2.5. According to Hair et al. (1998), the multiple collinearity of data is not significant.

Table 10 Regression analysis of interaction between Government Quality Award and environmental dynamics and enterprise performance

	Model 1		Model 2		Model 3		Model 4	
	b	β	b	β	b	β	b	β
Constant term	-0.005		-0.002		0.000		0.002	
Control variable								
Firm Scale	0.113*	0.113*	0.021	0.021	0.054	0.054	0.026	0.112**
Enterprise type	0.064	0.064	0.043	0.043	0.034	0.034	0.037	0.010
Enterprise district	-0.053	-0.053	-0.045	-0.045	0.006	0.006	-0.032	0.031
Argument								
Leadership			0.002	0.061	-0.045	-0.045	-0.156	-0.156
Enterprise culture			-0.042	0.066	-0.039	-0.039	-0.022	-0.022
Social responsibility			0.027	0.059	0.102	0.102	0.715*	0.715*
Strategic planning			0.075	0.072	0.075	0.075	0.761	0.761
Customer relationship management			0.038	0.075	0.062	0.062	0.539	0.538
Human resources			0.127	0.081	0.030	0.030	0.446	0.446
Process control			0.060	0.084	0.058	0.058	0.338	0.339
Knowledge management			0.078	0.069	0.001	0.001	-0.582	-0.582
Technical capabilities:			0.230*	0.075*	0.166*	0.165*	0.855*	0.854*
Manipulating variable								
Environmental Dynamism					0.440**	0.439**	3.376*	3.369**
Interaction terms								
Environmental dynamism* Leadership							.214	3.369
Environmental dynamism * Enterprise culture							.057	.214
Environmental dynamism * Social responsibility							-1.084	.057
Environmental dynamism * Strategic planning							-1.259	-1.087
Environmental dynamism * Customer relationship							-0.899	-1.256
Environmental dynamism * Human resources							-0.721	-0.895
Environmental dynamism * Process control							-0.412	-0.719
Environmental dynamism * Knowledge management							1.032	-0.411
Environmental dynamism * Technical capability							-1.244	1.028
R ²	0.023		0.291		0.445		0.559	
Correction R ²	0.016		0.270		0.428		0.535	
F	3.261*		13.955**		25.145**		22.956**	
ΔR^2	0.023		0.268		0.154		0.114	
ΔF	3.261		17.136**		112.933**		11.432**	
Sample number	424		424		424		424	

Note: * indicates $p<0.05$, ** indicates $p<0.01$.

Step 1: import three control variables, indicating that the explanation power of control variables is smaller on enterprise performance ($R^2=0.023$); F value reaches significance level, indicating the enterprise scale is significant on dependent variable, enterprise type and district are not significant on dependent variable.

Step 2: import the components of Government Quality Award to test the construction of independent variables on dependent variables under control variables. After adding leadership, enterprise culture, social responsibility, strategy planning, customer relation management, human resources, process control, knowledge management and technical capacity, model 2 is significant ($F=11.663$, $p<0.01$) and the explanation power to team innovation reach 29.1%, which is higher than that of model 1 ($\Delta R^2=0.195$, $\Delta F=13.140$, $p<0.01$). The regression analysis results of model 2 show that among the components of government quality award, only the influence of technical capacity on enterprise performance is positive ($p<0.05$).

Step 3: Introduce manipulated variable. The regression results show that after adding environmental dynamics, model 3 is significant ($F=25.145$, $p<0.01$) and the explanation power to enterprise performance reaches 32.4%, higher than that of model 2 ($\Delta R^2=0.154$, $\Delta F=112.933$, $p<0.01$).

Step IV: introduce the interaction between regulated variables and independent variables to test the regulation function of environmental dynamics on components of excellent performance and enterprise performance. After adding interaction, model 4 is significant ($F=22.95$, $p<0.01$), whose explanation power to enterprise performance reaches 55.9%, higher than that of model 3 ($\Delta R^2=0.114$, $\Delta F=11.432$, $p<0.01$). The regression results show that: the interaction is not significant on the regression coefficient of enterprise transformation and upgrading

3. Descriptive analysis of regression results

The regression analysis model shows that the enterprise scale has important significance on enterprise performance, and the effect of implementing Government Quality Award in large enterprises is more significant than SMEs. The functions of various elements on enterprise performance are shows as follows: (the order is downwards) process control, human resources, customer relation management, strategy planning, knowledge management, enterprise culture, leadership and social responsibility. The survey shows that the enterprise culture and social responsibility is negative on enterprise performance without reaching the significance in statistics. As one important factor influencing enterprise performance, environmental dynamics can regulate the relation between social responsibility and enterprise performance negatively, namely, when the level of environmental dynamics is higher, the social responsibility may not produce excellent enterprise performance.

The survey shows that the enterprise scale has obvious significance on the enterprise transformation and upgrading. The large enterprises can use their own strength to promote enterprise transformation and upgrading as soon as possible. The technical capacity is also important to the transformation and upgrading of enterprise. Therefore, it shall cultivate the technical capacity during the process of transformation and upgrading. The influence of other elements on enterprise transformation and upgrading is positive in different degrees, which has not reached the significance in statistics. The order of function is (downwards): process control, human resources, customer relation management, strategy planning, knowledge management, enterprise culture, leadership and social responsibility. Environmental dynamism is one important factor influencing enterprise transformation and upgrading. Enterprise changes and competitive dynamics can force the enterprise to transform and upgrade directly.

IV. Policy recommendations

Upon the current implementations of government quality awards in Zhejiang Province and the influence analysis on enterprise performance, we put forward the policies and suggestions as follows:

(I) Promote the depth and width implementing government quality award, balance the differences in district, industry and enterprise scale

The survey results show that the effect of quality award is varied due to the different in time and intensity. Hangzhou government pushed out quality award in 2011, but the sample enterprises are from that importing Government Quality Award from 2005 to 2010; the intensity of implementing Government Quality Award in Ningbo, Wenzhou, Jiaxing and Shaoxing is higher; the intensity and range of implementing excellent performance in other regions shall to be further reinforced. As for the intensity and effect of implementing excellent performance, it shall balance the different in various regions further and push out the model suitable to the local enterprises according to the actual circumstances.

The government department shall guide the enterprises to import Government Quality Award positively, set an example implementing excellent performance, promote the implementation of Government Quality Award in each industry and reduce the difference of Government Quality Award in each industry. In next stage, in order to guarantee the smooth implementation of "Importing Quality Awards" in Zhejiang Province, the government shall grant policy support and intellectual support to government quality awards in SMEs, and positively explore the schemes suitable to SMEs. At the same time, the government also shall perfect the objectivity and fairness of implementation and review inside, and stimulate the enthusiasm of SMEs to implement government quality award.

(II) Implement management philosophy and management method of Government Quality Award, guide enterprises to grope best implementation path according to the actual situation

During the process of implementing government quality award, many SEMs doubt that how to promote comprehensive performance using management methods and measures. Therefore, the government shall intensify the publicity force of Government Quality Award and create excellent social atmosphere for government quality award; pay much attention to the function of industry association in promoting government quality award, combine the Government Quality Award and advanced management methods in industry association, guarantee the Government Quality Award meet the reality in each industry, make highlights and characteristics in each industry; strengthen the publicity and guide of enterprise principals and make the principals to take the lead in enterprises; reinforce the reward and support for the enterprises implementing Government Quality Award in quality and quantity, encourage enthusiasm and confidence of enterprise; organize the experts to provide regular training for enterprises at all levels, in order to provide professional talents in the aspect of excellent performance; encourage enterprise to explore the best path to implement Government Quality Award according to the actual situation.

(III) Insist on the performance management system led by enterprise strategy, drive the enterprises to transform and upgrade at high speed

During the process of promoting government quality award, it shall encourage the enterprises to build and perfect performance management system and perfect strategy objective and performance measurement indicator system through teasing out the existing objectives and performance indicators. According to the idea of balanced scorecard and the requirements of excellent performance evaluation criteria on operation results, discover and determine the detailed indicators of enterprises, departments and posts, and then classify to manage according to the frequency (day, month or year) and competent department. The forecast on key performance measurement shall refer to the benchmark in industry and performance of competitors. Analyze the reasons according to performance comparison, formulate improvement measures, exceed competitors and benchmark to become the leader in industry. According to the relevance between enterprise functional department and enterprise overall strategic goal, the overall strategic goal can be decomposed to department performance objectives. Based on this point, the department shall implement the objectives to individuals according to their jobs, in order to form a complete and systemic performance evaluation system. Therefore, the government shall positively guide the enterprises to formulate effective strategy planning, improve the predictability on operation activities and competitive behaviors, intensify the strategy commitment to employees, society, consumers, suppliers and shareholders, promote brand image and sense of social responsibility through implementing excellent performance management, promote enterprises to change operation concept, adjust product structure and advance innovation ability.

(IV) Reinforce the foundation of enterprise informatization and management system integration, construct enterprise knowledge management platform and operation model

Many manufacturing enterprises lack knowledge or assets of information construction, so the information construction falls behind the requirement of rapid development generally. Therefore, the enterprises shall collect and perfect information management system systematically, recognize and develop information source, formulate and implement ERP and CRM information construction planning, and integrate and upgrade the original information management model effectively. As for the knowledge management, the enterprises shall tease out, build and perfect knowledge management process, control and incentive mechanism; perfect the knowledge map and library of enterprises and apply dynamic management and knowledge assets. As for the government, it shall continue to follow up the informatization progress of enterprises, urge the enterprises to accelerate informatization, guild the enterprises to integrate knowledge management model into information platform, especially, encourage the enterprises to excavate employees' knowledge for effective management and grope the unique model of enterprise knowledge management.

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Implementation of Government Quality Award

and its Impact on Firm Performance:

Based on the Survey of 424 Enterprises in Zhejiang Province

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Abstract: To guide and encourage the pursuit of excellence in corporate management quality, enhance their overall quality and competitiveness, Government Quality Award (GQA) was set around the province/city/county (district). However, the impact of the various elements of GQA evaluation criteria on firm performance needs further verification. This study adopted a random sample of 424 companies within Zhejiang Province to verify the impact of each element of GQA evaluation criteria on firm performance. The role, pathway and extent of GQA for enterprise performance were made clearer. Research shows that the implementation effectiveness of Government Quality Award in large companies is more significant than small and middle enterprises. The impacts of the various elements of GQA evaluation criteria on firm performance in descending order are: process control, technical ability, knowledge management, customer relationship management, human resource management, leadership, strategic planning, social responsibility, corporate culture. Meanwhile, policy recommendations were put forward.

Key Words: Government Quality Award (GQA); Firm Performance; Impact

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Consumers Evaluation of Chinese Consumer Organizations Social Supervision Function Related to Quality¹

——Based on Empirical Analysis of Chinese Macro-Quality Observation Data

Fan Ruimin

Abstract: Social supervision on quality by consumer organizations is an external supervision. In accordance with the operation process, it can be classified into pre-supervision, in-supervision and afterward supervision. Social supervision function of consumer organizations pales faced with the frequent occurrence of various quality safety incidents. Based on the statistics of 2012 China Quality Development Observation by IQDS, as well as the empirical analysis of social supervision on quality, it is found out that Chinese consumer organizations are not well acquainted by consumers and its prior public education function has not yet met people's needs, neither is the function in assisting government to implement quality supervision. The organizations have not become effective defenders of consumer quality relief. Meanwhile, the supervision function of Chinese consumer organizations is geographically uneven. In response to the above conclusions, it is suggested that we should broaden outlet promotion via TV media and public internet, improve public supervision on quality by means of various quality education modes, reform the cooperation mode between consumer organizations and government quality authorities, and vigorously build quality relief mechanism for infringement or disputes.

Key Words: Consumer Organizations; Social Supervision; Quality

I. Raise of the problems

In January 2012, a North American consumer organization called "Consumer Watchdog" required the US Environmental Protection Agency to retest the fuel consumption of Elantra automobile at the strong request of consumers. According to the test results, the organization instituted proceedings against Hyundai Motor for its alleged false advertising of "trumpeting only 5.9L fuel consumption per hundred kilometers". Eventually, Hyundai Motor acknowledged that the fuel calibration on the window label was incorrect and would compensate 1.1 million vehicle owners in North America. This is a "prosecution of North American consumer organizations against Hyundai Motor", also one of the many examples that foreign consumer organizations play an important functional role in quality supervision incidents.

In contrast, along with the frequent occurrence of quality safety incident in recent years in China, such as "Melamine milk scandal" in 2008, "Toyota recalls of millions of its cars" in 2010, "Shuanghui Lean Meat power incident", "stained bread" and "cooking oil" in 2011, plasticizing in liquor, Kentucky quick chicken in 2012, etc we see more disposals or punishments on the quality problems by government departments or agencies rather than the exertion of quality supervision function of consumer organizations in dealing with these incidents. In regard to the frequently occurred quality safety incidents, from the perspective of consumer awareness, what is the effect of Chinese consumer organizations' social supervision on quality? How can they exercise its functions more efficiently? This is an issue worthy of reflection and research.

Based on the data of 2012 China Quality Development Observation by IQDS (The Research Group of China Quality Development Observation of IQDS, 2013), from the perspective of consumer evaluation, the paper has made an initial empirical analysis on the function of social supervision on quality by Chinese consumer organizations, with a view to provide some reference for the effective exertion of the function. The paper is organized as follows: The first part puts forward questions. The second part evaluates the existing relevant literature. The third part defines the relevant terms

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and proposes theoretical hypothesis and research design framework. The fourth part makes an empirical analysis based on 2012 micro quality observation data. The fifth part is conclusions and recommendations, and puts forward research plan next.

II. Literature review

By reviewing the previous literature, researchers have studied the functions of consumer organizations from various aspects. Especially with more emphasis attached on quality safety, a more thorough study was made on the function of consumer organizations in dealing with quality safety incidents.

(I) Characteristics of consumer organizations

In western developed countries where market economy started earlier, consumer quality rights protection firstly aroused the attention of the scholars in these countries. Richard H. Buskirk and Jame T. R (1970) held that consumer rights protection was an organizational activity, aiming at enabling consumers to get reasonable compensation and relief in case of rights infringement. Consumer protection should not be limited to emphasize the material aspect of life but transform the focus from “life standard” to “life quality”. Creighton L.B. (1976) believed that consumer autonomy was different from consumer protection. Consumer autonomy is kind of material control of products and resources allocation, realized through market mechanism, while consumer protection is achieved through government intervention. Chinese scholar Liang Huixing (2000) held that although consumer association should have the common attributes of social groups, it is clearly seen that Chinese consumer association is a government-operated social group, showing many differences compared with consumer organizations abroad or other domestic social groups. Ao Shuanghong (2008), in discussion the transformation of Chinese consumer organizations, pointed out that market information asymmetry made it impossible for consumers to fully compete with business operators. Especially in the condition that consumers have lower bargaining ability, interests are almost all occupied by business side. The appearance of “consumer association” has made consumers’ bargaining position greatly improved, and with the further expansion of the association, the bargaining ability will continue to increase.

(II) Definition of social supervision function of consumer organizations

Scholars hold various views on the social supervision function of consumer organizations. According to the seven statutory functions of consumer organizations stipulated in Chinese Law on the Protection of Consumer Rights and Interests, Liu Zhengcao (2008) considered that there were mainly two aspects in the social supervision of Chinese consumer organizations: first, along with relevant government authorities to directly involve in the supervision and inspection of goods and services; Second, to reveal and criticize the damages to consumers’ rights and interests via mass media. Zhang Jun (2010) believed that the social supervision of consumer organizations was an external supervision, in the form of pre-supervision, in-supervision and afterward supervision. For example, before the occurrence of infringement, “consumption education, providing consumption information and service to consumers” are kind of pre-supervision; “consumption investigation, consumption experience and appraisal of commodities and services” are kind of in-supervision; a large number of disposals after infringement occurrence such as “accepting and processing complaints, public criticizing” belong to afterward supervision. However, Li Jiangang (2012) held that the social supervision function of Chinese consumer organizations referred to the second function stipulated in the *Law on Protection of Consumer Rights and Interest*, i.e. “involve in the supervision and inspection on commodities and services along with government authorities”.

(III) Characteristics of social supervision function of consumer organizations

Ding Shihe (1990) believed that the social supervision of consumer organizations was timely and extensive, practical and authoritative, objective and impartial, least of conservative and passive. Sun Ying (2010) held that the main task of consumer organizations in many developed countries were to carry out comparison test and provide reliable information; while consumer organizations in developing countries including China mainly provided some basic needs, such as consumer education, negotiation with enterprises on behalf of consumers’ interests, participation in the formulation of relevant laws and policies.

(IV) Problems of social supervision function of consumer organizations

Hou Xianfeng and Liu Sheng (2009) considered that Chinese organization associations put too much emphasis on afterward relief function while neglected the prevention function. Wang Weina (2009) held that China consumer associations did not play a good role in pre-education and guidance and afterward mediation. Ye Hong (2012) believed that the first and second function of consumer organizations stipulated in Article 32 of Law on the Protection of Consumer Rights and Interests were not well implemented, lack of tangible effects. Wei Haixing (2012) believed that Chinese consumer organizations lacked effective carrier and channel to realize supervision function. Professional media outlet was not enough, the website construction was immature, and mass media such as TV were mentioned only on legal holidays. Also, the channel of consumer organizations for

consumers to reflect problems was not smooth, and some inquiries and suggestions failed to get replies, which largely affected the social supervision effects of consumer organizations.

(V) Consumer organizations involved in quality management research

Burton Weisbrod (1974) put forward that the limitations and shortcomings of government and market in providing public goods had resulted in the functional needs of non-profit organizations. They can provide extra public goods for those with higher needs, and also provide special public good to people with special needs. Henry Hansmann (1980) first put forward the theory of contract failure, through a deep analysis of non-profit organizations' characteristics and advantages. He believed that the "non-allocation of profit constraint" feature of non-profit organizations was actually a forcible institution constraint on opportunistic behavior of producers in case of market contract failure, which can to some extent avoid or reduce the occurrence of contract failures. Cheng Hong (2008) first put forward in China that macro management on quality should adopt pluralistic governance approaches involving government, market and society, of which social groups such as consumer organizations were included. Li Changjian and Zhang Feng (2008), with the theoretical basis of social contract theory, introduced competition mechanism into food safety supervision, using economic parameters such as transaction cost and implementation cost for analysis, proposed to construct social supervision mode based on integration of existing social supervision resources. Fang Sheng and Zhou Min (2008) explored Chinese food safety issues from the perspective of stakeholder and held that consumer associations should give full play to the supervisory role.

In summary, the existing studies mostly employ the methods of comparison, case study and model analysis to make theoretical analysis on the function of consumer organizations, and there is little empirical analysis on the function of social supervision on quality.

III. Theoretical assumptions and study design

(I) Definition of the relevant concepts

Chinese word Jiandu is "supervision" in English, usually referred to monitoring and urging. Of which, Jian means surveillance and monitoring while Du means urging and punishment. "Society" means the overall relationship of interconnected people with common material production activities as basis. Different understanding on "society" in reality produces different understanding on social supervision. When regarding "society" as a human organization system, "social supervision" refers to surveillance and monitoring from all areas of society, similar to the general supervision mechanism, which is a broad understanding. When taking "society" as the supervision force beyond government and society, it is a narrow understanding. This article will use the narrow meaning of community supervision.

Social supervision on quality means a lawful supervision on the activities of quality subjects in economic social relationships by non-governmental social forces with various means in accordance with some rules. The subject of social supervision on quality mainly includes non-governmental bodies such as citizens, social organizations and news media. The object of social supervision on quality mainly includes the quality activities of enterprise production and operation as well as the quality administration of quality supervision authorities. The subject of social supervision on quality can be divided into: citizen supervision, social organization supervision and mass media supervision. The operation of social supervision on quality can be divided into: pre-supervision, in-supervision and afterward supervision.

Consumer organizations mean social groups composed of consumers in order to safeguard the lawful rights and interests of consumers (Liu Qingsheng, 2002). In China, according to Article 31 of *Law of the People's Republic of China on the Protection of Consumer Rights and Interests*: "consumer associations and other consumer organizations shall be social organizations that are established in accordance with law to carry out social supervision of commodities and services and protect the lawful rights and interests of consumers. In China, there are two types of consumer organizations: one is China Consumer Association and local consumer organizations; the other is other kinds of consumer organizations. Among the system of consumer rights and interests protection organizations, China Consumer Association is the most representative and has the greatest influence, so the consumer organization referred to in this paper means China Consumer Association.

(II) Theoretical assumption

First, function of pre-supervision on quality: most consumers believe that government is not the only effective subject that protects consumers' rights and interests, and there are some consumers that do not know the consumer organization at all. Meanwhile, it is widely recognized that the public education function that government fulfill can be implemented by social organizations, yet the education supply of Chinese consumer organizations is not enough, unable to meet that demand on quality public education.

Second, function of in-supervision on quality: consumers believe that consumer organizations lack of channels to participate in government quality monitoring, which is a main cause for the poor government supervision on quality.

Third, function of afterward supervision on quality: after suffering quality infringement, fewer consumers are likely to seek consumer organizations

to protect their own rights and interests and carry out quality infringement relief.

Fourth, it is regionally different that consumers evaluate the function of consumer organizations on quality supervision.

(III) Research design

It is clearly stipulated in Article 32 of *Law on the Protection of Consumer Rights and Interests*, summed up as follows: (1) provide information and advice services for consumers; (2) Participate in the supervision and inspection of commodities and services by the relevant administrative departments; (3) Report to, inquire of or make suggestions to relevant administrative departments on issues concerning the legal rights and interests of consumers; (4) Accept complaints by consumers and conduct investigation into and mediation of such complaints; (5) Where a complaint involves issues concerning the quality of commodities and services, it may require an appraisal department to appraise the quality. Such appraisal department shall advise the appraisal findings; (6) Assist aggrieved consumers in instituting legal proceedings against acts which harm the legal rights and interests of consumers; and (7) Reveal and criticise acts harmful to the legal rights and interests of consumers through the mass media.

The social supervision on quality of consumer organizations is an external supervision function on the quality of commodities and services of business operators, which is only one of the social supervision functions of consumer organizations. Besides the supervision of quality on commodities and services, consumer organizations also carry out social supervision on the price, quantities. Pre-supervision, in-supervision and afterward supervision, the division of social supervision functions of consumer organizations by scholar Zhang Jun, can reflect the full range of social supervision on commodities and services in the whole process. This division is suitable for the function division of social supervisions of consumer organizations. The paper adopts the divisions of pre-, in- and afterward supervision to make a research on the social supervision function of consumer organizations. For example, “quality education and guidance, providing quality information and advice services to consumers” before quality infringement occurrence belong to pre-supervision; “to carry out quality investigation on consumption, participate in the quality supervision and inspection by the relevant administrative departments, make comparative analysis on commodities” belong to in-supervision; After quality infringement, to “accept complaints by consumers and conduct investigation into and mediation of such complaints, support consumers to institute proceedings against quality infringement” belong to afterward supervision.

Based on the theoretical hypothesis and relevant data of 2012 China Quality Development Observation, this paper has made an analysis on the evaluation of social supervision on quality of consumer organizations from the pre-, in- and afterward supervisions, and made a further empirical study on the evaluation of consumers from different regions. Relevant analytical framework shown in Figure 1:

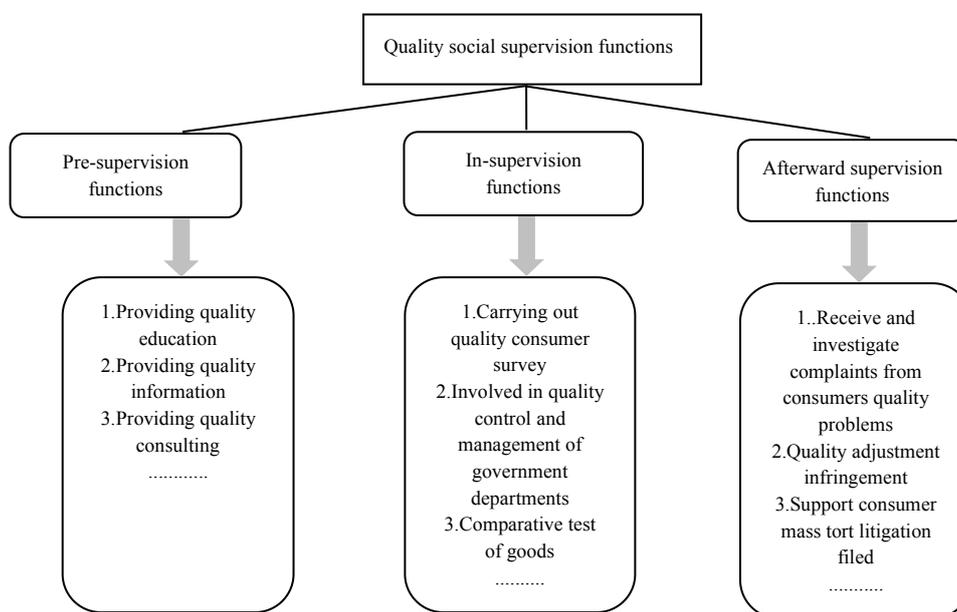


Figure 1 Framework of social supervision on quality of consumer organizations

IV. Empirical analysis

The datas adopted in this paper are from 2012 Macro Quality Observation based on consumer evaluation of 48 areas in 26 provinces, autonomous regions and cities by IQDS. Of which, 3736 questionnaires were distributed and 3416 were collected. After screening, the number of valid questionnaires is 2865, and valid response rate is 76.7%. A comprehensive data on consumers' evaluation on the supervision function of consumer

organizations can be drawn from the observation.

(I) Evaluation of pre-supervision function of consumer organizations

1. Consumer organizations own information transfer

Consumer organizations should make them well acquainted with consumers before effectively exercising the supervision functions. According to the observation, nearly 45.38% of all the consumers investigated hold that government is not the only effective subject to protect consumers' rights and interests, but there are 33.31% investigated consumers who do not know consumer organizations at all. This shows that consumer organizations' information transmission is blocked or transmission coverage is small. As shown in Table 1 and figure 2.

Table 1, Government protection of the quality rights of consumers

Do you think that government protection of consumer quality rights and interests is the only effective means?	No	45.38%
	Hard to explain	41.68%
	Yes	12.95%

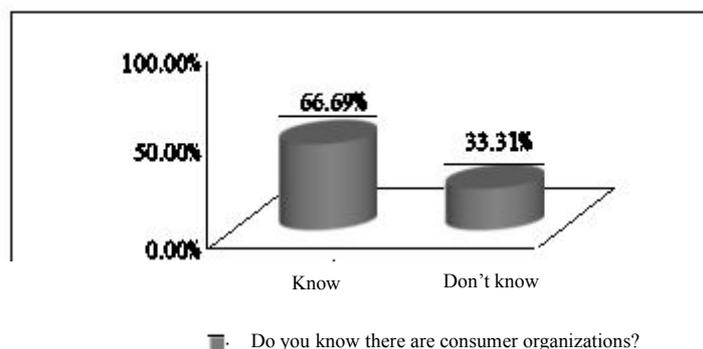


Figure 2 The cognition degree of consumer organizations

2. Quality education in public service delivery

Consumers possessed with screening abilities on quality are more conducive to quality supervision, while consumer groups with strict quality control require consumer organizations to carry out quality education for consumers. According to the data of observation, 82.01% of the investigated consumers have never received public service of quality education, of which 47.02% have heard but not received quality education, 34.99% have not heard the service at all, let alone receiving the service. The observation also shows that 40.84% of the investigated consumers believe that it is important that government fulfill the function of quality education, while 48.99% hold that the function can be undertaken by social organizations, which shows that it is very necessary for government to provide quality education service, however, some services can be given by social organizations. As shown in Table 2, Table 3 and Table 4 below:

Table 2 Acceptance of the quality education public services of the government

Have you received public services of quality education from the government?	Having heard but not received	47.02%
	Never heard of it!	34.99%
	Received	17.99%

Table 3 Importance of the quality education public services of the government

Citizen cognition on the importance of government fulfilling the function of quality education.	Importance	40.84%
	General	33.20%
	Very importance	19.76%
	Unimportant	4.40%
	Not so important	1.81%

Figure 4 Cognition degree on consumer organizations fulfilling public function

Do you think that the function of government fulfilling quality public education can be implemented by social organizations?	Yes.	48.99%
	Hard to explain	36.15%
	No	14.86%

(II) Evaluation of pre-supervision function of consumer organizations

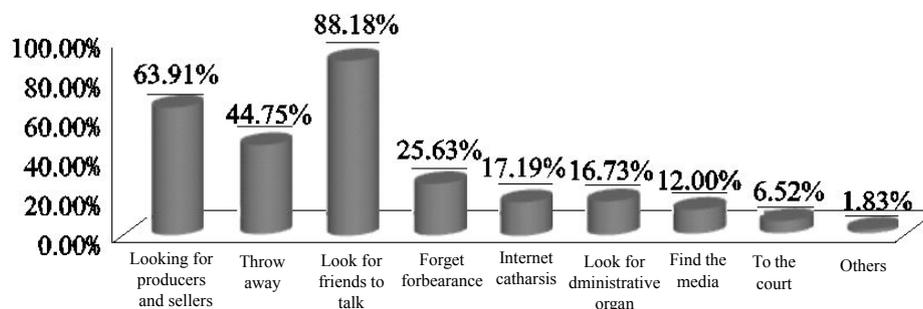
With respect to the basic evaluation of in-supervision on quality by consumer organizations, according to the Observation, 69.23% of the investigated consider that the cause for quality safety risks is inadequate government supervision. Of which, 51.64% of the investigated believe that the unsatisfactory government management is owing to “consumers’ lack of participation channel”. So that, government should fully implement quality supervision function and carry out pluralistic governance on quality supervision. Consumer associations should actively fulfill their social supervision on quality and participate in the quality monitoring and regulation of government. As shown in the following table 5

Table 5 Involvement of consumer organizations in assisting government with quality supervision.

What do you think is the reason of producing quality and safety risks?	Lax government oversight	69.23%
If you think the current government quality management is not satisfactory, the reasons you consider are:	Lack of consumer participation channels	51.64%

(III) Evaluation of pre-supervision function of consumer organizations

As for the basic evaluation on afterward supervision of consumer organizations, from the data of the observation, when buying commodities with quality problems, only about 1.83% of the investigated seek consumer organizations to safeguard rights and interests. This shows that consumer organizations have not obtained the full trust of consumers and they have not become the main reliance of consumers for quality rights protection. As shown in Figure. 3

**Figure 3 Approaches for rights safeguarding when buying commodities with quality problems****(IV) Regional difference of consumer evaluation on social supervision function of consumer organizations.**

Based on the above analysis and the regional sample of the observation, a further analysis was made on the regional difference of evaluation on social supervision function of consumer organizations. According to the common regional division of China, it is divided into three different regions, including Eastern, Central and Western Regions. Eastern Region includes 11 provinces or cities: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan, all of which are included in the 2012 Macro Quality observation sample. Middle Region includes 8 provinces: Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan, of which 7 provinces except Heilongjiang are covered in the sample. Western Region includes 12 provinces, autonomous regions or cities: Sichuan, Chongqing, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi and Inner Mongolia, except for the data of Tibet, Qinghai, Yunnan and Gansu, the others are all included in the sample.

There are some differences on the social supervision function of consumer organizations among the consumers in the three regions. First, as for the pre-supervision function, from the cognitive awareness of consumer organizations, 33.82% consumers in Western Region do not know the

organization at all, which is higher than 30.23% and 30.88% in Eastern and Central Regions. Moreover, from the awareness of consumers on public education, 53.33% in Central Region consider that the public education function can be undertaken by social organizations, higher than 45.88% and 50.98% in Eastern and Western Regions. Second, as for the in-supervision function, from the cognition of consumer organizations participating in the supervision of government, 63.35% consumers in Central Region choose the option of "not enough participating channels for consumers", higher than 46.55% and 54.90% in Western and Eastern Regions. Third, as for afterward supervision, after the occurrence of quality infringement incidents, 6.04% of the investigated consumers in Western Region choose consumer organizations to protect rights and interests, which is higher than 3.38% and 1.69% in Eastern and Central Regions. These data show that, as the regional imbalance of economic development among Eastern, Central, and Western Regions, as well as regional humanistic and social differences, coupled with the difference function exertion of consumer organizations in quality supervision contribute to the higher proportion on per-public education and inter-assistance function of consumer organization in Central region than that of Eastern and Western Regions. The awareness of consumer organizations and afterward quality rights and interests protection in Western Region is higher than that in Eastern and Central regions.

V. Conclusions and Suggestions

(I) Research Conclusion

Through analysis, we can draw the following conclusions:

First, consumer organizations in China have not been well acquainted by consumers and their pre-public education function has not yet satisfied the demand of people.

Second, consumer organizations' function of assisting government in fulfilling quality supervision has not fully developed.

Third, consumer organizations in China have not become the effective maintainer of quality relief.

Fourth, the supervision function of Chinese consumer organizations is geographically uneven.

(II) Suggestions

1. To broaden communication channels through TV media and public internet.

Currently, China Consumer Association has certain communication channels, such as the yearly-hold 3·15 party, 12315 hotline, Chinese Consumers magazine and official website. However, all these efforts are not satisfactory, for example, of all the investigated, only 66.69% know the existence of consumer organizations. The social influence and awareness degree in public should be further promoted, especially more outlet shall go to Western Regions.

First of all, in regard to some major quality problems of typical significance and concerning the vital interests of vast majority consumers, consumer organizations should carry out a thorough and effective investigation, actively follow up and continuously exert public pressure. Also, they should select some typical quality safety incidents to expose on TV media and urge the government to improve quality governance structure, becoming the active force of quality governance social reform. As mentioned in *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy* by Habermas Jürgen: "with the increased organization complexity and media coverage, more specialized and multi-oriented activities, there are different opportunities to have impact." However, the political influence obtained by activists through public relations must convince the public. Those that can convince them must be understandable proposals with general interest involving with themselves.

Second, by improving the existing media resources, consumer organizations should make full use of modern network communications to expand their influence by means of net channels, such as microblog, wechat, community information exchange platform. Meanwhile, they should communicate interactively with netizens on quality information and quality rights and interests, making their role in quality governance well known by the public.

Finally, consumer organizations should carry out various outreaching activities. Many social practices of foreign social organizations can be adopted: "taking website as central base, emails as strategic missiles, branches as military bases, processions, rallies and speeches as conventional weapons, policy makers as precise targets and traditional media as aircraft carrier." (Bi Yantao, Gao Haiyan, Zhou Yongxiu, 2006)

2. To strengthen the public education function of consumer organizations through a variety of quality education modes

The quality education of China consumer organizations should focus on: (1) showing the knowledge of identifying the qualities of commodities and services; (2) Teaching consumers to be well acquainted with legal rights and obligations in quality, and telling consumers how to effectively solve quality infringement disputes to maintain the legitimate rights and interests.

It is proposed to make full use of the existing "consumption education" of China Consumer Associations and "quality education" of national

administrative departments, adopt various quality education modes, such as holding consumer quality education seminars, lectures, knowledge contests, establishing student groups, distributing educational materials and setting up education center, and carry out multi-faceted quality education work in communities, schools, enterprises and villages.

3. To reform the cooperation mode between consumer organizations and government administrative authorities

Consumer organizations separate from government authorities, change the original affiliation with government, and form independent social organization. A new cooperative relationship with government shall be established to form a joint force for quality governance. This new cooperation should be built on the function transformation of government, promoting quality problem governance in the form of government buying service. Government should develop laws and regulations on public service, such as open tendering, project contracting, project application and entrusted management, making it clear of the rights and obligations between government and consumer organizations with contract, and gradually establish a project-contracted contract management mode.

4. To vigorously build quality infringement dispute relief mechanism convenient to the public

Though there are provisions on summary procedures in the current Code of Civil Procedure in China, it remains cumbersome for the disputes with smaller controversial target amount but frequently occurred incidents, as consumers need to expend lots of time and efforts on proceedings. The features of consumer quality infringement disputes, such as “small target amount”, “strong timeliness”, “large quantities”, “more dispersed”, make it incompatible with China’s current formal settlement mechanism. As a result, few consumers in practice have solved quality rights and interests disputes through current mechanism. Some either directly solve it with business operators, or just eat humble pie.

In response to the above phenomenon, except that the existing consumer organizations act as infringement dispute mediation body or lodge independent public interest litigations on behalf of consumers, it is proposed that “Consumer Disputes Circuit Courts” be established within consumer associations via cooperation with People’s Court all over the country. For the complaints that consumer associations fail to mediate, the Circuit Court will directly start summary procedure, taking the preliminary investigation materials as evidence to file and hear the case on the spot, achieving a dispute resolution mechanism of resources sharing, function complementation, combined proceedings with mediation, and building green channels for quality rights protection. The good news is that such Circuit Court has been established in some regions. For example, Quanzhou County People’s Court Consumption Disputes Circuit Court was inaugurated in the local consumer association on April 23, 2013. The author suggested that this mechanism be promoted and popularized across the country.

(III) Next research program

This paper has only adopted part of the data in 2012 Macro Quality Observation by IQDS, and made an initial empirical analysis on consumers’ evaluation on the social supervision function of consumer organizations. On account of the limitations of current studies, in-depth and optimized research should be carried out next. First: more indicators and parameters should be introduced to construct a comprehensive and scientific evaluation system of social supervision function of consumer organizations. Second, by taking the attributes information of consumers as factors, such as gender, age, household type, education degree and job, a research should be gradually done into the evaluation. Third, a longitudinal compassion in accordance with time sequence research can also be implemented in the next studies.

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Consumers Evaluation of Chinese Consumer Organizations Social Supervision Function Related to Quality: Based on Empirical Analysis of Chinese Macro-Quality Observation Data

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Abstract: The consumer organizations' social supervision function of quality is an external supervision. In the light of the operating period, it can be categorized as supervision in advance, supervision during the process, and afterwards supervision. Although many accidents related to quality security have happened these days, the consumer organizations' social supervision function of quality is still in a weak position. According to the data

from macro-quality observation conducted by Wuhan University Institute of Quality Development Strategy in 2012, the empirical analysis of consumer organizations' social supervision function of quality indicates that the public is not fully aware of the current consumer organizations and consumers organizations' forwards supervision of public education have not effectively met the requirements of Chinese citizens; the function of helping the government to carry out the quality supervision during the process has not been fully realized; the organizations have not been the activists of protecting quality for consumers. Meanwhile, the consumer organizations' social supervision function of quality differs from various regions. Suggestions can be advised based on these conclusions: it is necessary to widen the publicity channels by different manners such as televisions or the internet, enhance the consumer organizations' social supervision function of quality by applying different education methods, change the way how consumer organizations and the government coordinate with each other, establish a consumer-oriented structure to resolve the quality tort disputes.

Key Words: Consumer Organizations; Social Supervision; Quality

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