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INTRODUCTION

On May 19, 2015, the State Council of China officially issued “Made in China 2025,” as the first ten-year action plan for the Chinese government to implement its strategy to become a strong manufacturing country. The core of this action plan is to accelerate the development of manufacturing innovation, improve quality and efficiency, and to achieve the transformation of the Chinese economy from high-speed growth to high-quality development. During this course, quality is essential for business survival and growth, like quality management in business management. The management of the costs of quality (CoQ management) has also been promoted to become a strategic management task of business enterprises in the country.

In 2010, the production output of China's manufacturing industry accounted for 19.8 % of the world's manufacturing output, surpassing the 19.6 % of the United States, and leaping to become the number one manufacturing country in the world (Li 2015). However, Chinese manufacturing enterprises are still at the low end of the global industrial production chain. Taking the “smiling curve” of the manufacturing chain (Shih 2014) as an example, among the processes of product R&D, parts production, modular parts production, assembly production, product sales, and after-sales services, the Chinese manufacturing industry mainly dominates in the product assembly stage, which accounts for the lowest amount of added value in the chain, while the two stages at the beginning and the end of the chain, which have the largest profit margins, i.e., product R&D and after-sales services, are mainly dominated by business enterprises in the developed countries. This situation is somewhat related to the developing status and relatively low quality of the products of the manufacturing industry in China.

In February 2016, the State Administration of Quality and Inspection of China (SAQI) announced the results of the 2015 national sampling quality inspection of daily necessities and textiles, electronic and electrical appliances, light industrial products, food-related products, etc.—a total eight major product categories. For the sampled products/goods covered, the overall quality conformance pass rate was 91.1 %, for a total of 25,345

batches of products manufactured by 24,505 business enterprises nationwide. For the situation of quality appraisal and inspection between 2011 and 2015, the overall quality pass rate was 87.5 %, 89.8 %, 88.9 %, 92.3 % and 91.1 %, respectively, showing an upward trend with minor fluctuation. Among the eight major categories of products being covered by the national sampling quality inspection, for light industrial products, machinery and security products, construction decoration, repairing and decoration materials, and agricultural production materials the overall quality inspection pass rates have increased steadily. But, compared to 2014, the quality conformance pass rate for daily necessities and textiles was down 1.2 %; for electronic appliances it was down 7.3 %; for electricity materials it was down 1.7 %; and for food-related products it was down 1.7 %. Among the 191 kinds of products being sampled and tested, eighty-two kinds of products had a quality conformance pass rate of above 90 %, but thirty kinds of products had a quality pass rate below 80 %. Satellite automobile navigation equipment and electromagnetic stoves had the lowest quality inspection pass rates, at only 45 % and 7.7 %, respectively. This shows that the quality of China's industrial products/services was much less than satisfactory before 2015.

Since the beginning of the twenty-first century, especially since the 2008 worldwide financial crisis, most countries have begun to refocus on manufacturing production in order to establish a new engine for economic growth. In 2012, the US National Science and Technology Council released the “National Strategic Plan for Advanced Manufacturing,” aiming to reinvent the manufacturing industry by taking advantage of new information technologies (e.g., internet-based technologies). The Trump Administration spared no efforts to promote the “Return of Manufacturing Strategy.” In Europe, the German government officially announced the “Industry 4.0 Program,” in 2013, aiming to promote the upgrading of the manufacturing industry in pace with the progression of the Fourth Industrial Revolution, putting a development emphasis on artificial intelligence, Internet of Things networking and advanced technology integration.

According to some studies, the manufacturing industry in China is facing five major challenges or problems at the moment: non-optimized industrial structure, low product quality and product value added, intensified competitive pressure from domestic and overseas competitors, high consumption of raw resources and energies, and severe environmental pollution. As a response, the Chinese government launched the action plan

of "Made in China 2025," in 2015. Under the general guideline of "innovation-driven and quality-first," the government has outlined the need to "enhance the innovation capability of the manufacturing industry nationwide and strengthen the brand-building for quality," with a plan to become a strong manufacturing power in three phases. In 2017, Mr. Xi Jinping, China's President and the General Secretary, presented a set of strategic development goals, in his Report of the Nineteenth National Congress of the Chinese Communist Party (CCP), to build a moderately prosperous society in the country; he proposed a significant change in the concept of development, i.e., to alter the mode of economic development, with an emphasis on more vigorous improvement of quality and efficiency in economic growth. The report highlighted that the Chinese economy must transform from the stage of high-speed growth to a new stage of high-quality development. Quality and efficiency should become a high priority to stimulate economic development in China, setting quality improvement as the main direction of economic growth in order to significantly enhance the advantages and benefits of quality in the Chinese manufacturing industry. Apparently, this new development strategy is in line with the characteristics of the Chinese economy in the New Era of fast advancement in technologies and innovations worldwide, and it should be able to drive the Chinese economy towards sustainable development with high quality, and to continuously satisfy the growing and multifaceted demands and needs of the Chinese people for a better life.

The quality of products and services not only affects consumer behaviors, business activities and the performance of enterprises or other economic entities, but is also directly associated with the healthy development of the national economy at the macro level. As pointed out in the Report of the Nineteenth National Congress of the CCP, the Chinese economy has now shifted to a new phase of high-quality development , and quality management has become more and more important in business enterprises. Obviously, "quality improvement" and "efficiency enhancement" are the core drivers for reactivating the Chinese manufacturing industry in the current course of economic transformation; that is, to maximize the economic benefits of quality at both micro and macro levels.

Doubtless, "quality improvement" and "efficiency enhancement" in the production of products/services can have two interpretations: one is closely related to the improvement of quality to enhance production efficiency, "to do things right once" is the necessary condition of high efficiency and

effectiveness; another is associated with the attainment of brand value and value added at the high-end of the industrial or manufacturing chain to maximize efficiency and economic benefits. From the perspective of the second interpretation, "quality improvement" and "efficiency enhancement" require a pursuit to achieve high quality and great economic benefits. Mr. Karl Marx contended, in his work of "*Das Kipital* (1868), that a commodity has two inherent attributes: one is to have usage value, and the other is to have value (i.e., trading or transaction value). Only when a commodity (product or goods) has been produced and can meet the expected needs of consumers will its usage value be recognized by consumers, and only then it is possible to complete the "thrilling jump" to realize the value of the commodity accordingly. Quality is an embodiment of usage value and the object of a commodity or product to which its transaction value is attached. The quality of a product not only reflects the magnitude of its usage value, but also fundamentally determines its trading or transaction value. Economic benefits of quality can be expressed as the relationship or the trade-off between quality costs and quality benefits. Quality needs resource spending or costs to build up and maintain. When the benefits derived from quality are greater than the costs to fulfill quality requirement, there will be a positive economic benefit of quality; on the contrary, when the costs exceed the benefits, the economic benefit of quality will be negative. The Costs of Quality (CoQ) should be a key determinant to measure the production efficiency and economic benefits of quality for a business enterprise. Thus, strengthening CoQ management in all business enterprises can ensure the realization of economic benefits being associated with the attainment of the national economic development strategy of "quality improvement" and "efficiency enhancement."

High-quality economic development at the macro level cannot be separated from high-quality production output at the micro level. Business enterprises are basic units of the national economy, and the quality of their products/services directly affects or determines whether the national economy can grow with high quality and high efficiency. In particular, in the new campaign of "Made in China 2025," there is a desperate demand for vigorously strengthening and improving the quality of products/services for all Chinese business enterprises, to improve their quality management systems, laying down the foundations for the effective implementation of the national economic development strategies set out by the Chinese government.

Quality management is a key element of contemporary business management, and effective quality management and CoQ management must be directly interlocked to carry out the operational strategy of business enterprises or other economic entities. This requires the innovative application of strategic management tools to build up a comprehensive CoQ management system to control production and operation activities from the perspective of strategic management, in order to fully bring into play the efficiency and effectiveness of quality management, and to significantly enhance the quality of products/services as well as the operational efficiency and effectiveness, in order to ensure the survival and sustainable growth of business enterprises.

In light of the importance of CoQ management, we undertake a research project of "Innovative Strategic CoQ Management Systems of Chinese Enterprises," which was funded by the National Natural Science Foundation of China (NSFC). During the period from 2016 to 2020, we have actively conducted a series of research activities, including a systematic review of the relevant literature in China and overseas, theoretical analyses for developing latent constructs and conceptual issues underlying CoQ management, field investigations or onsite interviews of business managers and functional management professionals in varied industries across the country, and large-scale questionnaire surveys for data collection and analysis. We have also developed analytical models for empirical tests and case studies, and so on. Thus, several research outputs and results have been achieved in progression, adequately fulfilling the intended objectives of the research project.

We have investigated the current situation of CoQ management in Chinese business enterprises. In general, the cognitive awareness or perceptions of the strategic CoQ management, and the demands for its application by business managers and quality management and financial professionals in Chinese enterprises were systematically examined with an extensive review of the literature on theoretical and practical development of CoQ management in China and Western countries. We analyze and define the connotation of innovative strategic CoQ management concepts and methods; and empirically test the relationships among varied components of CoQ and the associations between innovative strategic CoQ management and the maturity of quality management systems in business enterprises, and between CoQ management and business operational efficiency and performance outcomes. Furthermore, we examine the experiences of some

Chinese enterprises pioneering in strategic CoQ management applications in the real business world, and compile a comprehensive report on this research project through all of these study activities. Our research findings demonstrate an increase in the number of Chinese business enterprises that have accepted and adopted the conceptual framework and practices of CoQ management in the implementation of Total Quality Management in the country.

The results of our study reveal that the awareness of the importance and necessity of establishing innovative strategic CoQ management systems among business managers and functional managerial professionals in China is rising. Some business enterprises have made great efforts in innovatively developing their quality management and CoQ management systems, and have achieved observably positive outcomes. The results of our empirical analysis also show that strategic CoQ management has a significantly positive effect on the maturity of quality management systems and operating performance in business enterprises and other economic entities in China.

However, our study results also indicate that, overall, innovative CoQ management in Chinese business enterprises is still developing and needs to be further strengthened. In particular, how to raise the comprehension of CoQ conceptual issues and promote CoQ management practices from the perspective of business strategic development remains an urgent but difficult task. Particularly, how to integrate CoQ management with the application of effective strategic implementation practice is still a critical issue to be contemplated seriously. There is a desperate need to speed up the establishment of appropriate theoretical and methodological systems of strategic CoQ management in the Chinese business environment; hence, to provide the necessary assurance to promote the improvement of the quality of products or services and the enhancement of the quality management efficiency and business performance of Chinese business enterprises, and thus to promote the high-quality development of the national economy.

We compile the study results of our research project in this book in order to facilitate research on the development of strategic CoQ management systems, and to better popularize the understanding and application of the theories and practices of innovative and strategic CoQ management in China. The background of the research project, the relevant theoretical literature and important conceptual issues, as well as the research methodology we have adopted, are elaborated in subsequent chapters. The main study outcomes and findings obtained from both theoretical and practical perspectives are

presented systematically. At the same time, some practical cases of CoQ management applications by several business enterprises, studied during our field investigations, are presented and discussed in this book. In addition, we elaborate on the relevant policy implications and recommendations, based on our study findings, as well as the study's limitations and potential research issues that could be further studied in depth in the future. We entrust that, in the new stage of China's economic development, the implementation of strategic CoQ management should have a crucial role to play, as it can significantly improve the quality of products/services to better satisfy consumer demands, substantially raising the standards of quality management and business management, and enhancing the operational efficiency and economic effectiveness of business enterprises in China.

We have received a wide range of support and assistance from many people and organizations in undertaking and completing this research project. First, we highly appreciate the National Natural Science Foundation of China (NSFC) for the funding support (Grant No. 71472127), which has enabled us to carry out the research project smoothly. We are particularly grateful for the joint efforts of all members involved in the research, including Prof. Yu Zengbiao from Tsinghua University; Prof. Shengqiang Liu from the Chongqing University of Industry and Commerce; Dr. Yuangang Duan, Ms. Hongchao Hou, Ms. Nan Liu, Ms. Yangyang Hu, and graduate students Xin Zhao and Teng Zhao from Capital University of Economics and Business (Beijing); and Dr. Yan Liao, Dr. Yali Wen, Dr. Zhiwen Gan and Ms. Qian Jing from Macau University of Science and Technology. We would like to thank the faculty members of several universities in China who have assisted us in distributing and collecting survey questionnaires. Thanks are also to the professional organizations such as the China Association for Quality, the China Association of Business Financial Managers, the Research Institute of the Ministry of Industry and Information Technology, and the China Association of General Accountants for their assistance in the conduction of our field studies and investigations, and to those business managers and quality management and financial professionals who attended the interviews on our field visits or investigations, as well as to those business enterprises and individual respondents of the survey questionnaires, for their participation and support.

The content of this book is organized in two parts. Part I presents the research background and main study objectives, with systematic reviews of relevant literature in Western countries and China. The development of

major research issues, conceptual constructs and connotations, and significant theoretical relationships relating to the evolution of quality management and CoQ management in China and overseas are outlined and verified from the perspective of strategic management. This helps to formulate a conceptual framework for the development of strategic CoQ management contextual to the current business environment in China. Part II is on the practical implications of strategic CoQ management. Empirical examination of the correlations between CoQ management and quality management, and CoQ management and business performance (e.g., growth and profitability) are performed through regression analyses. Case studies of the actual applications of strategic CoQ management in some pioneering business enterprises in China are summarized with their application experiences, and practical solutions are elaborated and presented.

We sincerely thank a group of industry specialists and senior academic scholars for their participation, and their valuable comments and suggestions expressed in the three research seminars and workshops on the progress reports of the study outcomes of this research project, including Prof. Haijun Sun of Renming University of China; Prof. Guliang Tang of the University of International Business and Economics (Beijing); Prof. Yunguo Liu of Sun Yat-sen University; Prof. Yuanliu Fu of Xiamen University; Prof. Yuting Liu, the former Director of the Department of Accounting Affairs at the Ministry of Finance of China; Profs. Lei Fu, Yeguang Cui, Yuanju Ma and Baixing Li of Capital University of Economics and Business (Beijing); and Director Wei Li from the Research Institute of the Ministry of Industrial Information Administration of China.

We also thank all of those industrial associations and business enterprises for their assistance to our research team members over the course of this research project, especially in our field studies and investigations. In addition, we acknowledge Capital University of Economics and Business (Beijing) and Macau University of Science and Technology for their physical support and clerical assistance to the members of this research team in conducting the research work smoothly. Finally, we would like to express our gratitude to Ms. Lorna Pierce, and Mr. Adam Rummens, the Commissioning Editor, and the editing team at Cambridge Scholars Publishing, and to others, for the review and editorial assistance during the publication of this book.

PART I

CONCEPTUAL ISSUES AND THEORETICAL ANALYSIS OF STRATEGIC CoQ MANAGEMENT

CHAPTER 1

OVERVIEW OF THE RESEARCH

This book presents the main study results of our research on "Innovative Strategic Costs of Quality Management Systems in Chinese Business Enterprises," which is funded by the National Natural Science Foundation of China (NSFC). Since 2016, our team members have visited the China Association of Quality Management, the China Association of Business Financial Managers, the China Institute of Chief Accountants, and The Research Institute of The Ministry of Industry and Information Technology of China, and more than a dozen business enterprises in different industries across the country, including Huawei Co., TCL Company, Sinotruck Co. Group, Benz (Beijing) Co., Beijing First Machine Tool Factory, Changchun FAW Group, Gree Electrical Appliances Ltd, Changling Group, Huadun Plastics Ltd., Beijing DaBo Co, Xi'an Jinduicheng Molybdenum Ltd, Novel New Energy Co., Guangdong Pratic CNC Technology Co., Gearshift Eissmann Auto Parts. Co., etc., and conducted field studies and investigations. We also designed and performed a large-scale questionnaire survey on different kinds of large and medium-sized enterprises across the country to collect data for analyses in the respect to the perception of conceptual and practical issues regarding the costs of quality (CoQ) and the current situation of CoQ management practices in business enterprises in China. The research project was fully completed in early 2020.

1.1 Research Background

The Chinese economy has been undergoing the "supply-side structural reform" in recent years, and the national policy on economic work formulated by the central government has explicitly set out four reform objectives: "cutting overcapacity in production," "decreasing inventory stocks," "lowering financial leverage" and "reducing costs" (Xi 2017). A major problem in Chinese production and supply systems is the over-supply of low- and medium-end products and an insufficient supply of high-end products. Therefore, a goal of the supply-side structure reform is to improve

the quality of supply, expand effective supply, improve the adaptability and resiliency of production-supply structures to accommodate rapid changes in market demands, and better fulfill the needs of consumers or users.

CoQ management can be closely tied into the new development of economic reform in China. Why do enterprises keep a large amount of inventory stocks? Or, why is it that a considerable amount of products cannot be sold? There are a variety of reasons for enterprises being unable to sell their product inventories. We contend that, besides the factors determined by the demand and supply relationship in the market, overstock of product inventories is associated with the quality of products produced. Thus, it is necessary to consider how to decrease the overstocking of product inventories and accelerate cost reduction through CoQ management. "Cost reduction" should include the reduction of various kinds of costs. The production costs of products should be reduced, of course, but there is a limit to this perspective. The production of a product requires a certain amount of raw materials, direct labor and overhead spending while the prices of raw material and labor costs, generally, keep rising steadily. Although there is certainly room to cut production costs, it will become difficult to further decrease production costs after reduction to a certain extent. When the production cost cannot be effectively further reduced, CoQ is a big source for cost reduction in the complete chain of production to consumption.

According to the literature, CoQ has a significant impact on the operational performance of business enterprises (BSI 1990; Basak 2014). For instance, Joseph M. Juran (2003), a famous quality specialist in the US, points out that the costs associated with quality are much greater than the amounts shown in the financial statements over the past few decades. For most manufacturing enterprises in the US, CoQ took up, on average, 15 % to 25 % of their sales revenues in the 1980s, or CoQ accounted for 25 % to 40 % of their operating expenses (Crosby 1979; 1996). These costs of quality are mostly direct or observable, but some are indirect or invisible (Cheah *et al*. 2011). Some scholars in Israel suggest that the losses due to nonconformance with quality standards are estimated to be about 30 % of the gross production values, based on national survey data in the country. Other researchers even argue that, in the most conservative estimates, the total amount of CoQ for many business enterprises exceeds their total operating incomes (Atkinson *et al*. 1994; Campanelle 1999; Ahmad *et al*. 2012).

What is the situation of CoQ distribution in Chinese business enterprises? There will surely be a broad range of perspectives on this issue. In fact, quality has long been a major issue for Chinese manufacturers. In a period of rapid economic reform and development in China, customers' demands for quality products and services keep rising in the market. Due to resource limitation and technological barriers, many Chinese business enterprises have not placed an emphasis on ensuring quality but, rather, have sought extensive growth. Many products have not met the national quality standards or have failed to satisfy consumers' expectations. Some business enterprises have even tried to maximize their short-term profitability at the expense of the quality of the products/services produced.

For example, a few dairy product manufacturers, including *SanLu* Dairy Company and *Mengniu* Dairy (Meishan) Co., were found to have melamine in some batches of their dairy products, which may cause the undernutrition of babies who use their milk powder products. As the news was exposed, Chinese consumers lost confidence in all dairy products produced by domestic manufacturers, even leading to negative impacts to other national brand-named producers such as *"Mengniu*" and "*Yili.*" For a period of two to three years, Chinese consumers gave up domestic dairy products and only purchased imported milk powder products, which caused a sharp price rise and shortage in the supply of baby milk powder products in overseas markets (Liu and Luo, 2004).

To our estimation, the total level of CoQ is, at least, greater than 15 % of the overall sales revenues for business enterprises in China. This is an extremely significant amount. For an enterprise with RMB¥ 100 million of sales revenue (RMB¥ 7.00 = US$ 1), the 15 % CoQ level is equal to RMB¥ 15 million. Reducing this part of CoQ is a huge source for cost reduction and profit increase. In fact, keeping other production factors constant, a dollar saving in CoQ equals to a dollar increase in operating revenues or net income by a business enterprise. In addition to reducing the production costs, a business enterprise can increase its profitability through CoQ management to reduce the total amount of CoQ from 15 % to 10 %, or even to 5 %, which should bring in a large amount of potential profits directly. At the same time, CoQ management should improve the quality of products/services substantially and continuously, so that a business enterprise would have the potential to increase its sales and reduce the amount of product inventory stock. Therefore, the implementation of strategic CoQ management, particularly from the perspective of business

strategic development, is directly associated with both "cost reduction" and "decreasing inventory overstocks." This can play a very positive and effective role in business restructuring and management, and the current supply-side economic reform in China.

Quality is a significant issue and more cases of quality problems have been exposed publicly in recent years, domestically and internationally. For instance, a Toyota car recall by the Japanese manufacturer due to brake failure caused them an estimated loss US$ 5 billion. Another case is the more recent recall of the Samsung Note 7 model smart phone due to cell battery failure, the estimated economic loss was about US$ 5.3 billion for the Korean manufacturer.[1] All these losses were related to the quality failure of products and demonstrate how severe CoQ impacts on business performance and survivability can be. Even a small product defect or quality problem may result in huge losses for a business enterprise.

In China, the overall level of quality for products/services has been less than satisfactory in the past few decades (Chan and Li 2015). According to the statistics from the sampling quality inspection survey of business enterprises in seventy-five key cities in China, from 2014 to 2018, released by the National Bureau of Statistics, as shown in Figure 1-1, the overall rate of quality losses by Chinese business enterprises was 0.2 % in 2014, 1.0 % in 2015, 1.9 % in 2016, and 2.0 % in 2017: a steady rising trend.

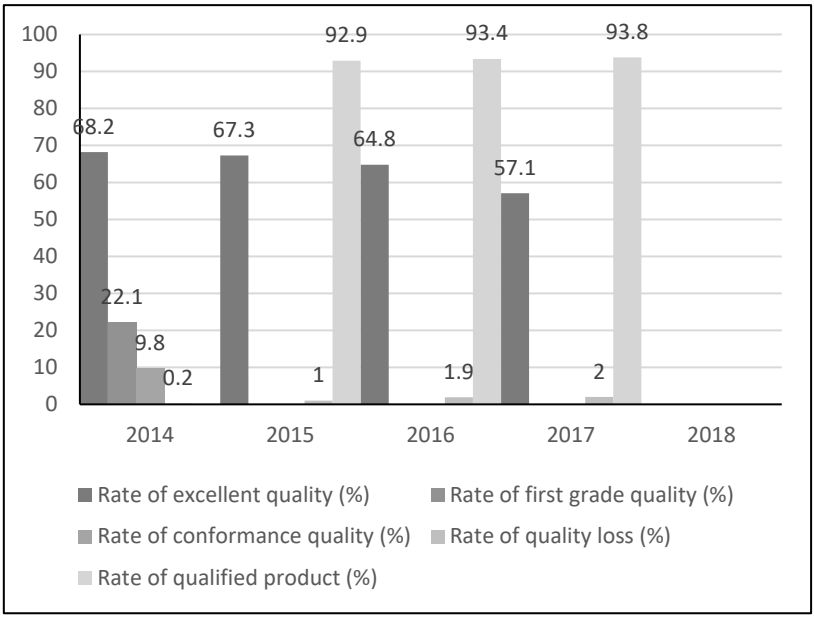
Using a simple calculation of the total quality losses of Chinese business enterprises (quality loss = operating income x quality loss rate), based on operating revenues of RMB¥ 116.52 trillion for industrial enterprises nationwide,[2] the estimated total losses due to quality problems would be about RMB¥ 2,330.43 billion (total quality losses = 116,521,4 x 2 % = 2,330,428), which is certainly a huge amount of potential revenues or profit income being lost across all of the industrial enterprises in China. Therefore, the quality of the products/services has a significant economic consequence

[1] See CNN news report. October 14, 2016. https://money.cnn.com/2016/10/14/technology/samsung-galaxy-note-7-profit-loss/. Others estimated that the incident cost Samsung US$17 billion in lost sales. https://www.androidauthority.com/samsung-galaxy-note-7-permanently-discontinued-721283/.

[2] As released by the National Bureau of Statistics of China, the total operating revenues of industrial enterprises were RMB¥ 116.5214 trillion, in 2017, increasing by 11.1 % from the prior year.

not only for individual business enterprises but also for the national economy.

Figure 1-1 Quality Information for Business Enterprises in Seventy-five Major Cities in China 2014–18

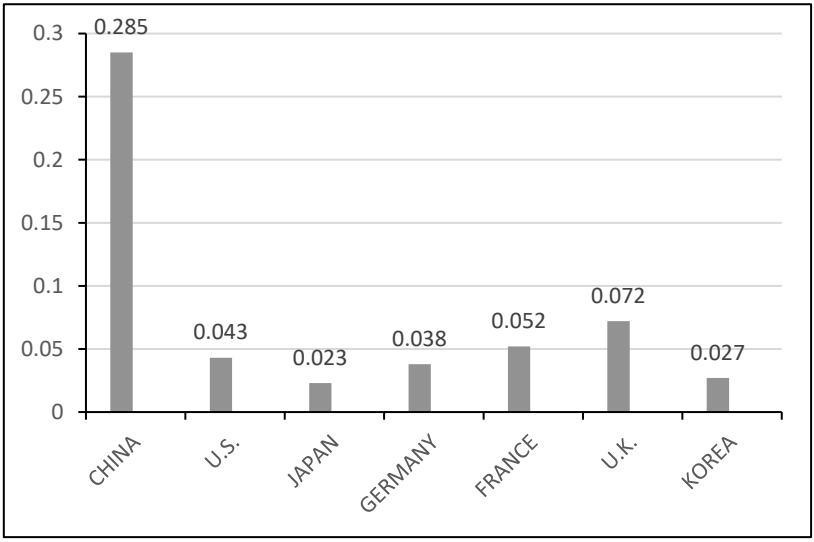


The aforementioned cases of quality problems and statistics further illustrate that quality has a significant impact on the survivability and development of business enterprises; it can trigger a crisis or be an opportunity. Business enterprises can gain a better development by enhancing quality management and improving product quality, as well as effectively reducing CoQ and enhancing operating performance (Atkinson *et al*. 1994; Al-Dujaili 2013; Beecroft 2001; Kerfai *et al*. 2016; Dahlgaard *et al*. 2018; Duan and Lin 2018).

In fact, before 2015, product quality was a significant problem in China, which is evidenced in three ways. First, the overall level of product quality and technical standards in China had been falling behind that of other industrial countries substantially, even while Chinese manufacturing industries were becoming highly competitive in general. In the late periods

of the last century, “Made in China” was a label for poor product quality in some industrialized countries, seriously damaging the credibility and image of the products produced by Chinese enterprises (Guan and Yao 2003; Huang 2013). As shown in Figure 1-2, China’s export commodities have had the greatest portion of product recalls in the world markets, in terms of the number of problematic products reported for recall abroad, with direct quality losses of more than RMB¥ 200 billion, and an even much larger amount in indirect losses. Taking toys products as an example, from July 2013 to June 2014, one year after the full implementation of the EU’s new Toy Safety Directive, *the Rapid Exchange of Information System (RAPEX)* in the EU identified a total of 498 toy products made in China and exported to EU countries for recall due to quality and safety problems, with more than twenty toys made in China being reported by the EU RAPEX each month. The recall rate was much higher than that of other major industrial countries.

Figure 1-2 Comparison of the Index of Product Recall for Exported Commodities in 2014



Source: The Ministry of Industry and Information of PR China

Second, Chinese business enterprises also face the challenge of insufficient investment in brand building and brand maintenance. In 2013, the number of industrial enterprises in China was over 343,000 and they produced industrial value-added of RMB¥ 21.07 trillion, ranking first in the world. However, only thirty-six Chinese enterprises were on the list of the "World Top 500." Among the world's top 500 brands (2014), only twenty-nine Chinese product brands were selected, much lower than that of the United States, France and Japan.

Third, the overall quality standard system is relatively low in the country. According to relevant statistics, the number of China-led international standards accounts for less than 0.5 %, and the update of product standards has fallen behind major industrialized countries (e.g., Germany, the United States, Britain, Japan and others) by more than one generation. The contribution of leading Chinese enterprises to industrial growth is much lower than the average level in the developed industrial countries.

Nonetheless, the Chinese government has paid increasing attention to quality issues in recent years. In particular, the central government has sponsored a series of nationwide campaigns to promote quality in the business world, aiming to encourage and push business enterprises to pursue excellence in quality, and develop brand-name products with independent intellectual property rights. The goals of these quality campaigns have been set to continuously enhance product/service quality for building a new image of "Made in China," and to promote the transformation of "Chinese products" to "Chinese quality" (SCC 2015).

On May 19, 2015, the State Council at the central government issued the *Notice on Printing and Distributing of "Made in China 2025*" (hereinafter referred to as the *Notice*), which clearly states its aims of "cultivating a manufacturing culture with Chinese characteristics and realizing the historical leap of Chinese industries from a large manufacturing power to a strong one." The *Notice* requires "quality-first as a strategic development objective of business enterprises," so that all economic entities should place an emphasis upon quality as the lifeline of constructing a strong manufacturing country in China. Strengthening the quality of products/services must be the main responsibility of business enterprises, with extended efforts in research on quality technology applications. The government will set up efficient legal and standards systems for quality monitoring/supervision and create a market environment for honest production, taking the development path of

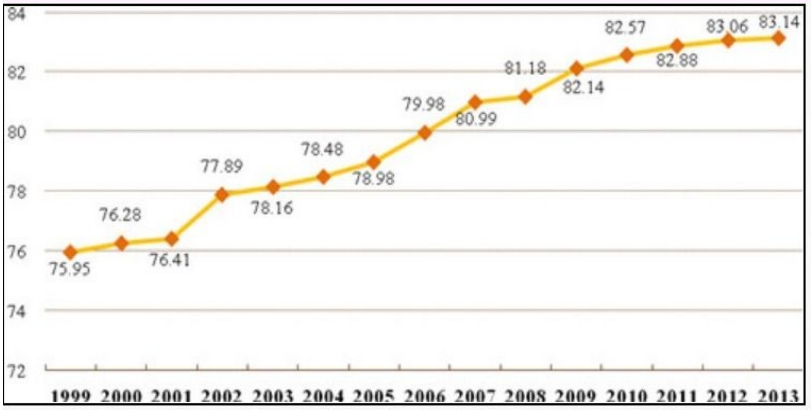
"winning by quality." At the same time, the *Notice* proposes that enhancing quality brand building should be a strategic task of Chinese business enterprises. Obviously, the promotion of improving the quality management mechanism for business enterprises has become a national strategic goal for becoming a strong manufacturing powerhouse in the world. Later, the General Office of the State Council issued the *2016 Action Plan for Implementation of Quality Development Outline,* which clearly states that business enterprises must make greater efforts to improve quality management and operating efficiency, in the course of deepening the "supply-side structural reforms," to promote the construction of a strong quality industry in China (SCC 2016).

In the seventh interpretation of "*Made in China 2025*," the comprehensive economic and technological indicators reflecting the overall quality of the Chinese manufacturing industry are presented with twelve specific indicators in six dimensions in terms of quality level and growth capability. It is expected that, in the next ten years, the situation of insufficient demands in the international market will not be fundamentally changed. The traditional low-end industries/goods will inevitably have weakening competitive advantages. Quality competitiveness should continue to enable a moderate rate of growth. As shown in Figure 1–3, if taking the average annual improvement rate of quality of 0.19 points from 2000 to 2013 as a parameter, it could be estimated that the overall quality growth in the country will reach 84.5 points in 2020 and 85.5 points in 2025. There is still much room for progress in the quality competitiveness of Chinese business enterprises.

In the era of intensified global competition, in particular, the Chinese economy has entered a period of slowdown, facing more competition by domestic and foreign enterprises, and rapidly intensified competition in the world markets. Business enterprises have entered the stage of meager operating profits, so it is necessary to make a shift from price competition to quality competition. However, the ultimate competitiveness lays in the cost competitiveness of a business enterprise. The level of operating costs determines the competitive strength of a business enterprise, and a reduction in operating costs can also be derived from the efficiency and effectiveness of CoQ management. At the same time, consumer behavior in their choice of products/services has changed. They used to focus on the price of products/services, but now they care more about the quality. From a price-oriented economy to an experience-oriented economy, consumers now pay

greater attention to product quality and cost-effectiveness in their purchasing, to seek higher levels of satisfaction. This also shows that CoQ management will play a more critical role in reducing operating costs, attracting customers/consumers and creating economic benefits for business enterprises.

Figure 1-3 Growth Rate of Quality Improvement for Chinese Business Enterprises (1999–2013)



1.2 Objectives of the Research

The Report of the Nineteenth National Congress of the CPC in 2017 further explicitly stated that the Chinese economy must make a shift towards high-quality development (Xi 2017). Obviously, improving the quality of products/services of individual enterprises at the micro level is a crucial driver to attain high-quality and efficient economic development at the macro level. Establishing sound and highly efficient strategic CoQ management systems for business enterprises can ensure the high quality of products/services produced by business enterprises, thus, better satisfying the growing demands of consumers, and gaining the best efficiency and effectiveness of business production and operation. This should help to ultimately achieve the overall strategic goals of high quality and the efficient development of the national economy, and prompt China to become a strong and modernized country with socialist characteristics.

In the situation of promoting quality improvement and efficiency enhancement in China, a comprehensive study of the theoretical and practical issues of quality management and CoQ management should be highly relevant and useful. This research project aims to review, examine and analyze the development of CoQ management in Chinese business enterprises to summarize successful experiences and identify practical deficiencies. This should assist in promoting CoQ management in Chinese business enterprises in alignment with the national campaigns of quality improvement. For instance, we have found, in our enterprise field investigations, that there are still many problems or deficiencies in CoQ management practices by business enterprises in China. Firstly, the adoption of CoQ reporting and management has not been popularized. Although some managerial personnel are aware of the major conceptual issues and potential impact of CoQ, quite a large number of business managers and quality control professionals have not fully understood the importance of CoQ management. Even if they do understand it, most of them only employ CoQ management at the stage of simple reporting and have not yet applied CoQ management in combination with other strategic management operations, thus, lacking comprehensive CoQ analysis and application overall. Apparently, CoQ management cannot be restricted to the simple measure`and reporting of CoQ items. Since the key function of management accounting is reporting and analysis, it is beneficial to have both quality control professionals and managerial accountants to carry out a variety of analyses and applications for CoQ management to be raised to the level of importance of strategic management or for it to become a major task of strategic business management. However, this is not the case at present in most business enterprises in China.

Another issue is that the CoQ reporting and management practice exists mainly in a small number of Chinese manufacturing enterprises. There are few applications of CoQ management in non-manufacturing enterprises, and it is applied even less in privately-run business enterprises now. Through this research, we find that privately-run business entrepreneurs (PREs) are more interested in CoQ concepts and CoQ management techniques, although their awareness of CoQ management is still bare. From the perspective of practical application, first, CoQ management systems in the state-owned business enterprises (including non-manufacturing industries) must be strengthened, because the state-owned enterprises (SOEs) have a dominant share and play a most significant role in the Chinese economy. At the same time, in the current stage of the New Economy,

reforms of mixed ownership economy are accelerating, and the Chinese government will offer more support to privately-run business enterprises. We contend that it is necessary, or even an urgent task, to actively promote strategic CoQ management in China, not only to expand CoQ management practices for manufacturing enterprises and state-owned enterprises, but also to apply CoQ management in non-manufacturing enterprises and privately-run business enterprises, in particular, to enhance product/service quality and prompt high-quality development of the national economy in the country. This is a main push underlying our motivation to carry out this research project on strategic CoQ management in the context of the Chinese business environment.

It is worthy to note that, based on our study results, the CoQ management by most business enterprises has yet to be carried out from the perspective of strategic management, which is surely worthy of great attention. It is necessary to accelerate the adoption of CoQ management systems, from the traditional CoQ reporting practices of the past to more integrated and comprehensive applications of strategic CoQ management, to really enhance the quality of products/services produced by business enterprises and their production efficiency and effectiveness. As a result, this should create the conditions for prompting the strategic development of business enterprises and yield good business performance. Only with this approach, can business restructuring with the supply-side economic reforms of "reducing inventory stocks" and "cost reduction" become truly effective in the course of developing the national economy with high quality and great efficiency in China.

1.3 Study Methodology and Procedures

Firstly, we began carrying out this research project in 2016 by starting a systematic review of domestic and overseas literature on quality management and CoQ management, through extensive reading and analysis, to obtain a comprehensive understanding of the updated theories and practices of business quality management and CoQ management in China and other countries. We explored relevant theoretical issues and determined key research issues with an in-depth perspective. The conceptual framework and theoretical constructs of CoQ have also been developed based on literature review and theoretical analysis. The research plan, composed of a series of relevant investigations and field studies, was formulated accordingly.

Secondly, we conducted the overall research design by identifying specific research issues and relevant study questions and contemplating the appropriate methodologies and study procedures (including developing specific study methods/tools and survey instruments). Then, we engaged in field studies of several business enterprises, in varied manufacturing and service industries across the country, to collect data for the empirical examination of relevant theoretical constructs and research issues. During the field studies, our team members conducted group interviews, dialogues or seminars with the responsible staff and employees of the functional management departments (e.g., Quality Control and Assurance, Quality Appraisal/Inspection, and Accounting and Financial Management) and the senior business executives as well. Field visits or observation of the actual operation of quality management and CoQ application (if in existence) and the review relevant internal reports or summary data of those business enterprises were part of the field investigations performed. During this period, our research team members also supervised and trained eight postgraduate students at master's and doctoral levels to choose their research theme, to assist in data collection and the initial processing in the field studies, and to prepare their graduation theses or dissertations under our supervision.

Thirdly, we conducted a large-scale questionnaire survey with two approaches: i.e., paper questionnaires distributed to a variety of business functional managers and senior executives from the part-time EMBA or DBA programs in nine universities across the country and on-line survey questionnaires distributed to business managers in a sample of listed companies in China. We initially analyzed the cognitive awareness of the importance of quality, quality management and CoQ management, and the correlations or casual relationships among them with data collected from the returned questionnaires. Factor analysis was used to extract related conceptual constructs (including the distributions and functioning mechanisms of CoQ components) for correlation analyses and regression analyses to examine the CoQ applications (i.e., CoQ reporting and integration of CoQ with business strategic management), and to empirically test the impact of CoQ management on business performance (e.g., revenue growth and profitability).

Fourthly, our team members analyzed the research data and information to produce several types of research output, i.e., written research reports and published academic papers. We have also organized and held three research

seminars and workshops to present and discuss our research output in progress, inviting groups of industrial specialists and renowned academic scholars to provide comments and advice on our study results in progress and on the outcomes of this research project, which have been taken into consideration in our research work by phase.

Finally, we have prepared a comprehensive research report to the funding agent (i.e., NSFC) by analyzing our research results, putting forward relevant policy recommendations and explaining further research issues. Subsequently, we compiled this book for publication with the aim to disseminate our research findings to a wide range of readers. Therefore, this book not only systematically outlines the theoretical issues and practical significance of strategic CoQ management research, but also elaborates on the necessity of establishing strategic CoQ management systems and the feasibility of these applications from different perspectives. In addition, through diagnostic analysis and the compilation of case studies and research reports from our field visits, and the investigation of business enterprises and industrial organizations across countries, the book aims to provide both theoretical reference and practical guidance to promote the development and operability of strategic CoQ management systems in business enterprises in China.

1.4. Contributions of the Research

This book is an outcome of our research project, and it contains new study findings with originality. In summary, we have made contributions to four aspects of the research on strategic CoQ management and its application in the context of the Chinese business environment, with both theoretical and practical implications.

1) Theoretical Extension

Our study extends the perception of the attributes and the extendibility of CoQ. We contend that, in theory, CoQ includes dual attributes. Quality reflects the usage value of commodities or products; the operating activities carried out by business enterprises to produce usage value are related to quality innovation or value creation. Thus, the input or costs for product innovation and upgrading should be a composing element of CoQ. Based on the traditional theories proposed by early quality management experts (e.g., Feigenhaum 1956; Juran and Gryna 1993; Ittner 1996; Williams *et al*.