

Decline in the Effectiveness of Accounting Information A Logical Analysis of Divergence Between Goal and Reality

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Abstract

The decline in the quality of accounting information in the special market environment of China is a common objective phenomenon. But because of the lack of the empirical data analysis, the traditional explanations for this phenomenon are limited to some fact determination or empirical judgment. Based on such fundamental principles as knowledge constraint, hypothesis of rational man, and insider control, this paper employs a logical empirical approach to establishing the logical empirical hypothesis and logical empirical model by selecting four kinds of factual evidence, namely, knowledge, cost, interest, and collusion. Through the proof technique of logical reasoning, this paper verifies the existence of the logical empirical hypothesis, and conducts the analysis of the factors affecting the decline in the quality of accounting information and the process in which these factors operate. To directly show the shocks to the accounting quality from the affecting factors, certain models are constructed, and the conclusion of this paper is presented.

Keywords: *Quality of accounting information, Knowledge constraint, Hypothesis of rational man and Collusion.*

Introduction

Along with the social-economic development, accounting has become the information system that provides various useful information to the users with different information demand in their decision making. Given the fact that the accounting objective is defined as the usefulness to decision making, the characteristics of the quality of accounting information are those that make accounting information useful to decision making. However, in the special market environment of China, the widespread existence of a set of erosive variables has result in the poor quality of accounting information and thus the decline in the effectiveness of accounting information. The above judgments are made on the basis of four fact variables that are closer to the truth, namely, lack of knowledge preparation, interest or tax shock, cost analysis, and collusion of interest community. Because of the widespread objective existence of these fact variables, the quality of accounting information in its real state is always below the standard of the quality of accounting information. Moreover, the shock to the quality of accounting information from the accounting environment further widens this gap.

Significance of the study: This paper develops and tests two propositions: 1. In using accounting information for decision making, the users should be prudent and aware of the unavoidable errors in the

accounting information, including human error and other errors. Therefore, the comprehensive judgment of the account information should be made by taking other relevant information into consideration; 2. With respect to the empirical study practice in the accounting research, the conclusions of the empirical studies should be made in a prudent and reserved way before the reliability and objectivity of the relevant parameters of accounting research have been validated.

Theoretical Framework

Goal Orientation and Realistic Constraints

Goal Orientation of Accounting

By reference to the definition of the term “quality” as given in the Quality Management and Quality Assurance-Vocabulary issued by the International Organization for Standardization in 1994, the quality of accounting information can be defined as “the set of characteristics of the accounting information that gives it the ability to satisfy express and implicit needs”. (Xiao, 1988). This is a relatively broad definition, which encompasses all connotations of the usefulness and compliance of accounting information. And the other goal orientation of accounting is a set of quality characteristics of accounting information as prescribed by the existing accounting standards. (e.g. reliability, relevance, understandability, comparability, substance over form, materiality, prudence, and timeliness) (Kong, 2006). This set of quality characteristics represent the measurement standards of the quality of accounting information for meeting the users’ need for account information in their decision making process, and are the qualitative constraint of the accounting information system on the accounting information for meeting the goal of accounting.

The former definition of quality is too abstract to be grasped, while the latter also has the problem of having too many quality standards that are not coherent, in particular, the reliability and relevance can never be fully compatible with each other. Though the quality standards of accounting information are by no means perfect, the author of this paper still maintains that the accounting information is the essential currency signal in the market economy, and the timely and accurate currency signal is the most important and essential condition to guide the capital flow and the rational allocation of capital.

The goal of accounting is the expected state that people strive to achieve. In the process of achieving this goal, people are fettered by a series of negative factors such as bounded rationality, calculation of gain and loss, and interest interference. In particular, in the different accounting environment, these negative factors will make different impacts.

The existing quality standards of accounting information are based on reliability and focused on relevance and also take other evaluation criteria. The reliability requirement addresses the problem of the objectivity of accounting information, while the relevance requirement addresses the problem of the usefulness of accounting information for decision making. Without reliability, it would be impossible to maintain the quality of accounting information. Lack of relevance, the economic essence of the quality of accounting information would be lost. For this reason, reliability and relevance are the equally important characteristics of the quality of accounting information. The useful accounting information must be both of reliability and of relevance. The reliability and relevance are closely linked and jointly affect or determine the usefulness of accounting information (Weng, 2004).

Realistic Constraints

The desired value of the quality of accounting information is to meet the users’ needs for making economic decisions to the maximum extent. In the real world situation, however, the desired value of the quality of accounting information will be restricted and interfered by various subjective and objective factors, thus causing the real level of the quality of accounting information below the desired value. These constraint factors include:

Knowledge Shock

The constraint of knowledge is reflected in two aspects: 1. The incomplete knowledge of the providers of the quality standards of accounting information: This constraint condition is a natural attribute. According to the bounded rationality theory, the people's cognitive level is limited because of two reasons: one is that the environment is complex. In the form of non-personal exchange, people face a complex and uncertain world. The level of uncertainty increases along with the increase in the number of transactions, and thus the information is more incomplete (Simon, 2004); the other one is that people's computational ability and perceptual ability are limited, and no person could be omniscient; 2. The recipients of accounting knowledge: As there are numerous accounting practitioners with different levels of expertise and experience and they understand the ever-changing accounting knowledge and conduct accounting treatment according to their expertise levels and experience, the results of the accounting treatment inevitably vary among these practitioners. To sum up, these double knowledge constraints lead to the gap between the desired value and the actual value, with the uneven characteristics.

Interest Shock

Analysis from Perspective of Conflict

From the perspective of social conflict theory, conflict refers to a tension state that is caused by the incompatible interest objectives, judgment of gain and loss or disagreement on gain and loss of the different interest subjects (Bu, 2005). The resulting interest constraint refers to the impact of the inconsistency of the interests of accounting policy-makers and those of the implementers of accounting policy on the quality of accounting information. In China, the accounting policy-makers have their specific interest inclination and political inclination of ensuring the growth of fiscal revenues. As an interest group, the motivation of the government and government officials to participate in political activities is to maximize their own interests (Bai, 2002). In contrast, the implementers of accounting policy tend to maximize the corporate interests and management interests. Therefore, the interests of these two groups are deviated and from each other and in conflict with each other. Even though the objective of the implementers of accounting policy lowers to the sustainable business operations, the direct conflict of interest of these two groups is unavoidable.

The conflict of interest between the accounting policy makers and implementers is primarily caused by the unilateral supply of accounting policy. The centralized policy supply mechanism under tradition system is indeed superior to the policy formation mechanism through bargaining in terms of efficiency (Bai, 2012), but in the process of formulating accounting policy the pursuit of efficiency function would inevitably lead to the loss of reliability (degree of collective consensus) (An & Xi, 2004). In addition, as the accounting policy by its nature is a criterion of the appropriation of interests, and the supply of accounting policy lack of the degree of collective consensus does not have the attribute of rigid constraint, two negative consequences, namely, game playing within the rules and institutional patching, would occur as a result of the accrual rules and the policy program options limited by the uncertainty of economic activities. This would result in the game playing in the process of implementing accounting policy and thus affect the quality of accounting information.

Analysis from Perspective of Game Theory

Whether analyzing from the perspective of individual rationality, or from the standpoint of positivism or the observable facts, in respect of the essential nature of the appropriation of interests relating to the accounting information and the results of earnings it discloses, the state interests and corporate interests, the corporate interests and insider interests, the sustainable business operations and opportunistic selection, and the revenue accumulation and interest sharing obviously reveal the characteristics of non-cooperative game. This non-cooperative game is primarily reflected in the sharing of tax between the State and the enterprises. According to the empirical research findings presented by professor Watts and Zimmerman in 1999, as an interest group, the motivation of the government and government officials to participate in political activities is to maximize their own interests (Ross L. Watts & Jerold L, 2006). Since the rules on tax sharing

are unilaterally formulated by the government, the government will strive to secure its resources control right by formulating various regulations including taxation and accounting policy. In a similar way, a business entity as an economic man aims to maximize its own interests. Therefore, the disagreement between these two players is quite large.¹

In the process of tax collection, on the one hand, the tax authorities collect taxes in accordance with the existing tax policy; on the other hand, the taxpayers, who perceive their interest loss is greater than the perceived benefit of “tax’s being used for the people”, will certainly adopt countermeasures to avoid the excessive interest loss. The empirical studies have shown that in the process of tax planning by Chinese listed companies, conducting earnings management by selecting different accounting policy to achieve the purpose of tax avoidance is the primary means being used (Tang,1995). The game relationship between the tax authorities and taxpayers in the process of tax collection is thus formed, which results in the loss of tax revenues. The following table shows the estimated loss of tax revenues in the different periods in China by several scholars:

Table 1 Proportion of Loss of Tax Revenues in China

Scholar	Hao Chunhong	Wu Yunfeng	Dou Xiaoran
Years under Study	1996 to 2002	2000 to 2006	2003 to 2009
Amount of Loss of Tax Revenues	RMB 32.365 billion to 79.286 billion	RMB 426.323 billion to 958.417 billion	RMB 636.5 billion to 1645.4 billion
Proportion of Loss of Tax Revenues	1.9% to 11.47%	27.53% to 33.88%	27.64% to 31.8%

The above figures show that the amount of loss of tax revenues in China is high, which represents relatively high tax risk. The loss of tax revenues is the result of the game between the tax authorities and taxpayers. The main channel(Meng,2013) used by taxpayers to avoid taxes is so-called underground economy (Zhu &Yang,2000).²

Analysis from Perspective of Behavioral Economics(Wang,2011)

The prospect theory developed by Daniel Kahneman and Amos Tversky holds that: 1. individuals tend to be risk averse in a domain of gains; 2. individuals tend to be risk seeking in a domain of losses; and 3. people are more sensitive to losses compared to gains(Chen,2012). Therefore, when facing gains, people tend to be very cautious and do not want to take risks; when facing losses, people tend to be less risk averse and are willing to take risks. The degrees of people’s sensitivity to losses and gains are different. Losses hurt much more than gains feel good. We are much more sensitive to losses than to gains. And the degree of people’s sensitivity to loss leads to different behavioral options.

¹ Notes: Based on its interest preference, the government will strive to secure its resources control right by formulating various regulations including taxation and accounting policy. The various damages to the enterprises because of the existence of political activities are called “political cost” (including rent-seeking cost, tax control cost, and social contract cost).

²Notes: “Underground economy (Xiaobin Miankun 2000) generally refers to all economic activities that are out of the government’s regulation, taxation and monitoring, do not pay taxes to the government, and their output and income are not included into the GDP. From the perspective of taxation, the underground economy is divided into two types: Type 1 is the illegal economic activity, such as graft, bribery, embezzlement of state property, producing and selling counterfeited products, smuggling and drug trafficking, illegal financing, internet fraud, gambling, and money laundering; Type 2 is the legal economic activity that does not pay taxes to the government, such as unlicensed business activity, concealing income, and failing to make truthful report of income and tax. The underground economy is the main cause of the loss of tax revenues and a worldwide problem. The second type of underground economy can be regulated by institutional adjustment so that the loss of tax revenues will be mitigated and the tax revenues will increase.

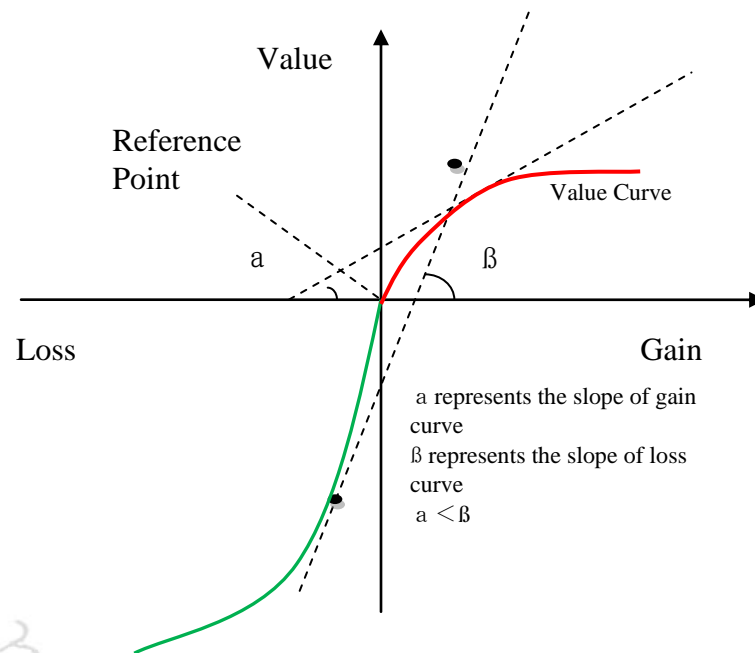


Figure 1 Value Curve

Near the origin of coordinates, the slope of the gain curve in the first quadrant is different from the slope of the loss curve in the third quadrant. Under normal conditions, the value function in the gain area is concave and in the loss area is convex. This indicates that the risk attitudes of a decision maker toward gain and loss are different, namely, risk aversion in face of gain and risk seeking in face of loss, and people are more sensitive to losses compared to gains ($a < \beta$), namely, the function in the loss area is steeper than that in the gain area, indicating that the people's sensitivity to loss and gain is different. The area between the gain curve in the first quadrant (red) and coordinate axis represents the change in value when people face gains, and the area between the loss curve in the third quadrant (green) and coordinate axis represents the change in value when people face losses. From Figure 1 we can see that the loss area is about three times the gain area.

To a certain extent, tax is the loss of an enterprise and the economic interest the enterprise has to pay out. According to the analysis from the perspective of game theory, the enterprise has two strategies in respect of the tax payment: paying taxes in full amount and evading the payment of some taxes. In choosing tax evasion, the enterprise faces the risk of the fines being imposed on it. However, according to the prospect theory, people tend to be risk seeking in the face of loss and they are willing to take risk. Therefore, in the process of tax game, taxpayers always tend to choose the strategy with higher risk, namely, evading the payment of taxes. To avoid paying taxes, the taxpayers will manage to reduce the taxable income as reflected in the tax return to the greatest extent by manipulating accounting information. This will inevitably result in the distortion of the accounting information.

From the Figure 2 we can observe that, during the period 1990 to 2010, China's total tax revenues increased by 25.94 times, of which the domestic VAT revenues increased by 52.73 time, domestic consumption tax revenues increased by 12.45 times, business tax revenues increased by 21.63 times, and corporate income tax revenues increased by 17.93 times. These taxes constitute a heavy burden to enterprises. Therefore, after conducting analysis from the perspectives of conflict, game theory and behavioral economics, we can find that tax avoidance (i.e. legal tax avoidance) is the best choice of the enterprises facing huge tax pressure. And this tax incentive augments with the increase in tax burden. The Figure 2 shows the tax data in China during the period 1990 to 2010.

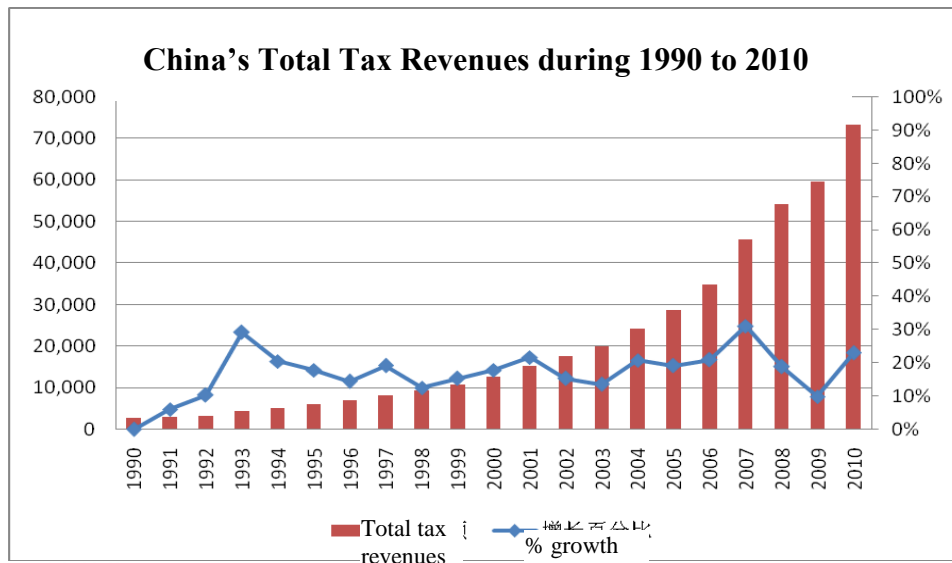


Figure 2 China's Total Tax Revenues during 1990 to 2010
Data source: *China Statistical Yearbook 2011*(State Statistics Bureau [SSB], 2011).

Cost Shock

According to cost-benefit theory, any rational agent engaging in economic activity will follow the cost-benefit principle and avoid loss-leader selling. The expectation that the benefits will outweigh the costs is the basic starting point that determines people's behavior and is therefore the primary rational principle of people's economic activities (Zhu&Bu, 2011). The recognition and measurement of the corporate accounting information should follow the cost-benefit principle, that is, the benefits generated by the accounting information provided by a firm's accounting department should outweigh the costs incurred in the process of providing such information (Liu, 2008). The cost constraint condition specifically applicable to the domain of accounting means that the recognition, measurement and reporting of accounting information are subject to the double constraints of economic cost and psychological cost. The improvement in the quality of accounting information needs to restrict the cost constraint to a certain extent and must avoid unlimited cost increase. The cost constraint comes from two factors: economic cost and psychological cost.

The economic cost of the accounting primarily refers to the cost of accounting work, namely, the economic cost incurred in the process of generating accounting information, which should be less than the benefits generated by the accounting information. Though the high-quality accounting information brings users the benefits of the reduction in transactions costs such as the costs associated with information search, identification and validation as well as the improvement in enterprise' credit rating, the accounting diseconomy will occur if the economic cost of generating such information outweighs the benefits obtained by the external users. The accounting costs should be lower than the benefits. For example, the principle of materiality is the typical compromise strategy under cost constraint.

The psychological cost of the accounting primarily refers to such psychological activity as disgust, pressure or giving up work of accounting practitioners in the face of an unfamiliar and complex transaction or business matter such as the asset impairment at the end of a reporting period or calculation of recoverable amount. The existence of this psychological cost has been confirmed by a number of random surveys of accounting practitioners (Shenzhen Junhexin Investment Management Consulting Co [SJIMC], 2012). The quality of accounting information is affected by the cost shock from the subjective and objective aspects, thus causing the further downward movement of equilibrium point of cost and benefit.

Collusion Shock

On the one hand, the finance managers of enterprises as the provider of the enterprises' accounting information will generally follow the quality standard of accounting information and provide true accounting information. On the other hand, as the "rational man" in the market, under certain conditions they tend to collude with the enterprise's management for securing their own personal interests. In such a situation, the distortion of accounting information and the decline in the quality of accounting information will become a highly probable event. The former may lead to the risk of losing job, while the latter may bring such benefits of promotion and salary increase. However, the actual behavioral options are not a subjective behavior, but are intrinsically affected by the interests.

Facing the dilemma of following the accounting quality standards or obeying management's will, the accounting practitioners encounter a typical prisoner's dilemma (Chang, 2006). Obedience is a typical survival choice, because the economic interest of the accountants is given by the enterprises where they work and not by the government, and they will certainly be partial to the enterprises.

From the prospect theory of the behavioral economics we can reach the same conclusion: People are much more sensitive to losses compared to gains. People facing losses tend to be risk averse. So when facing the risk of losing job and the prospect of promotion and salary increase, people tend to avoid the risk of losing job. For this reason, driven by the scarcity of professional posts and the maximization of own interests, the accounts under the survival pressure and interest temptation tend to collude with management rather than to uphold professional ethics. Under the condition where the agency mechanism is imperfect, the opportunistic type of accounting policy selection fosters the enterprise managers' moral hazard and adverse selection behavior (Christie, Andrew A & Jerold L, 1994). Consequently, when their professional integrity is under the huge objective pressure, the accountants would certainly choose to collude with the enterprise management to gain the spillover benefits generated by such collusion. At the same time, lenient punishment (or legal indulgence) further increases the success rate of collusion.

Results and Analysis

Logical Empirical Analysis

Based on the above understanding of the accounting goal and the realistic constraints on the effectiveness of accounting information, this paper proposes the following four hypotheses and validates the correctness of these hypotheses through the empirical data.

Logical Empirical Hypotheses

Hypothesis of Knowledge Shock

The analysis of the knowledge constraint condition reveals that the incompleteness of knowledge comes from the providers and recipients of accounting information. Facing the ever-changing accounting practice, the accounting policy makes have to provide the applicable accounting standards in a short time. Therefore, they must be affected by the knowledge constraint and the accounting standards they provide are not entirely ideal. On the part of the recipients of accounting information with limited knowledge, they can only understand the accounting knowledge and conduct accounting treatment according to their expertise levels and experience. Therefore the results of the accounting treatment inevitably vary among these practitioners. These double knowledge constraints lead to the gap between the desired value and the actual value. On the basis of this, this paper proposes the first hypothesis:

H1: The existence of knowledge constraint results in the fact that the actual quality of accounting information is below the ideal standard.

Hypothesis of Interest Shock

The conflict of interest between the providers and implementers of accounting system is primarily reflected in the economic consequence of the accounting. Specifically speaking, the interest shock is the tax shock. Because the tax burden of Chinese enterprises is significantly heavy, which constitutes a risk to the survival and sustainable operations of enterprises, the divergence of the interests of tax authorities and taxpayers exists and further evolves into the interest game. And because the firms are highly sensitive to the loss (in the specific situation, to a firm the tax is an expenditure that brings no return and can be considered as a loss) (Kahneman, 1979), the negative consequence of the games within the rules (e.g. policy implementation games, looking for and using policy loopholes) would inevitably occur. From common sense we know the firm's gaming wisdom outperforms the government's gaming wisdom. Therefore, through the analysis from the perspectives of conflict, game theory and behavioral economics, the author of this paper argues that, when facing the interest shock, firms will take some risk seeking actions to reach the equilibrium point of the benefits and risks, that is, the shock to the quality of accounting information by the benefits from the tax avoidance. On the basis of this, this paper proposes the second hypothesis:

H2: Under the circumstances where excessive tax exists, enterprises will try to offset interest shock by manipulating data of corporate earnings.

Hypothesis of Cost Shock

The behavioral options of the rational behavioral agents in their economic activities are always based on the measurement of costs and benefits. Only with the expectation that benefits are greater than costs, the behavioral agents will continue to carry out their economic activities. The consideration of costs and benefits relating to the provision of accounting information by enterprises is relevant to the economic cost and psychological cost previously mentioned. The enterprises have the economic incentive to improve the quality of accounting information only when these costs are lower than the benefits that can be generated by the accounting information. On the basis of this, this paper proposes the third hypothesis:

H3: Under the cost constraint condition, enterprises will conduct the measurement of accounting transactions or events by choosing the accounting method of the least cost.

Hypothesis of Collusion Shock

In the real work environment, the temptation of interest has become the variable that affects the behavioral options of the accounting practitioners. When the temptation of interest is large enough, the orientation of professional behavior of the accounting practitioners is clearly visible. In the environment where the gains generated by collusion are much greater than the sanction costs, the collusion becomes the basic behavioral option of the accounting practitioners as the rational men who are both affected by the scarcity of professional posts and their own interests. On the basis of this, this paper proposes the fourth hypothesis:

H4: Under the survival pressure and temptation of interest, accountants will collude with their enterprises to increase the insiders' benefits.

Variables of Empirical Logic

Explained Variables

The purpose of the empirical logic is to prove the actual gap between the enterprises' actual quality of accounting information and the ideal standard thereof, the causes of the gap, and the magnitude of the various affecting factors. The ideal quality of accounting information is a standard concept, which possesses two major characteristics: rationality and perform ability. Thus we have the following definition: The ideal quality of accounting information: represented as 1.

The actual quality of accounting information: AQ. AQ closer to 1 indicates the higher quality of accounting information, while AQ closer to 0 indicates the lower quality of accounting information.

Explanatory Variables

- (1) Knowledge constraint: The providers and recipients of accounting information are restricted by the limited knowledge, and this situation is difficult to change, as it is a natural attribute subject to empirical test. From the time when the accounting information is generated, the account information has been imperfect, and this situation cannot be changed through repeated measurement. Compared with the interest shock, the knowledge constraint is difficult to be controlled, and is in the secondary position. Therefore the impact of the knowledge constraint on the quality of accounting information is less than the impact of interest shock.
- (2) Interest shock: In China, the accounting policy-makers have their specific interest inclination and political inclination of ensuring the growth of tax revenues, and the tax revenues are the major part of the fiscal revenues. According to statistics, at least 85% of the annual fiscal revenues are from tax revenues or the nontax revenues of tax nature. Therefore the State must formulate a series of mandatory measures to guarantee the collection of tax revenues. As enterprises have to pay more than twenty kinds of taxes, the real average tax burden of Chinese enterprises is over 40%, which causes the intense conflict of interest between the enterprises and tax authorities, and “a tension relationship that is caused by the incompatible interest objectives, judgment of gain and loss or disagreement on gain and loss of the different interest subjects” (Liu, 1996) as defined by the social conflict theory, conflict refers is formed. The realistic picture of this tension relationship is reflected in the widespread game strategies, that is, enterprises employ all available means to avoid taxes. Therefore, this shock has the largest impact on the quality of corporate accounting information.
- (3) Cost shock: Enterprises are willing to maintain the quality of accounting information only when the benefits brought by accounting are greater than the costs incurred in accounting. Once the difficulty of accounting increases, and the economic cost and psychological cost are close to or over the benefits brought to enterprises and individuals by the quality of accounting, the enterprises will certainly reduce their input and effort to accounting and actively lower the consideration of accounting.
- (4) Collusion shock: The corporate accounting information is generated by the enterprises’ accountants using accounting procedures. Driven by the scarcity of professional posts and the maximization of own interests, the accounts under the survival pressure and interest temptation tend to collude with management rather than to uphold professional ethics. In addition, because the economic interest of the accountants is given by the enterprises where they work and not by the government, with the subjective will and objective pressure some accountant tend to collude with the enterprise management to gain the spillover benefits generated by such collusion. To obtain the benefits brought by the collusion, the collusion involves the concealing, distortion or even fabrication of the economic activity data to the superior principal (as in the principal-agent relationship). Consequently, the collusion results in the deterioration of the quality of accounting information (Luo, 2010).

Impacts of Four Shocks

The four shocks mentioned above all have negative impacts on the quality of accounting information to different extents. Therefore the different weights need to be assigned to these shocks.

Impact of knowledge shock:

The providers and recipients are restricted by the limited knowledge. Because the knowledge is carried by human being and reflected in people’s mental labor, the knowledge constraint is hard to be directly measured and can only be measured indirectly. Besides, the knowledge constraint also leads to the arbitrariness of accounting treatment. For example, a report published by the Institute of Economic

Observer shows that the best fair bad debt provision ratios should be 5% for the account aging within one year, 25% for the account aging of one to two years, 50% for the account aging of two to three years, and 100% for the account aging of over three years (Institute of Economic Observer [IOEO], 2006).³ But as shown in the following table, the actual situation presents a different landscape:

Aging Structure	Bad Debt Provision Ratio	Number of Companies	Bad Debt Provision Ratio	Number of Companies	Bad Debt Provision Ratio	Number of Companies
Within one year	5% and above	779	3% and below	438	0%	102
One to two years	25% and above	36	10% and below	1121	1% and below	39
Two to three years	50% and above	81	50% and below	1165	30% and below	1143
Over three years	100%	85	50% and below	718	10% and below	168

Table 2 The Statistics of the A-share Companies' Bad Debt Provision Ratios in 2004 by the Institute of Economic Observer

In addition, the author of this paper holds that the accountants should possess more complex knowledge in conducting the treatment of asset impairment. But in real work, many accountants do not perform any treatment of asset impairment due to lack of the relevant knowledge. This leads to the impact of the corporate accounting information and reduces the quality of accounting information. In 2003, the Shanghai Stock Exchange conducted a statistical study on the provisions for asset impairment of 771 companies listed on Shanghai and Shenzhen Stock Exchanges. The statistical results show that the total provisions for asset impairment account for 12.4% of these companies' net profits, indicating a high impact on profits (Yu&Yu, 2004). Based on the above analysis, the author of this paper conducted a statistical analysis of the provisions for asset impairment by the listed companies, in order to reveal the impact of the knowledge constraint on the quality of accounting information. We take 484 companies listed on the main board of Shenzhen Stock Exchange as a large population. At 5% acceptable risk of overreliance, 10% tolerable deviation rate and 3% expected population deviation rate, we use sample size table to draw 61 listed companies⁴ at random as the sample, and conduct a statistical study of the provisions for asset impairment by these companies (All data are collected from the official website of Shenzhen Stock Exchange).

³ The Institute of Economic Observer conducted a random sampling survey with 50 samples on the situation of bad claims of 1284 Chinese A-share listed companies at the beginning of period and the end of period in 2004. The results show that: In the balances at the beginning of the period of the account receivables with the aging within one year, 5.41% becomes the account receivables with the aging of one to two years at the end of period; in the balances at the beginning of the period of the account receivables with the aging of one to two years, 37.31% becomes the account receivables with the aging of two to three years at the end of period; in the balances at the beginning of the period of the account receivables with the aging of two to three years, 52.36% becomes the account receivables with the aging of over three years at the end of period; in the balances at the beginning of the period of the account receivables with the aging of over three years, 88.88% has not been recovered at the end of period. The above data fully reflect the increasing risk of bad debt with the increase in the account aging. Based on the above statistical results and the past experience of analysis, the Institute of Economic Observer reaches the conclusion on the fair bad debt provision ratios, namely, 5% for the account aging within one year, 25% for the account aging of one to two years, 50% for the account aging of two to three years, and 100% for the account aging of over three years.

⁴ In statistics, when $N > 30$, a population can be considered as the large population. In conducting sampling, the acceptable risk of overreliance should be fixed at a relatively low level, namely, 5%-10%.

Type of Impairment Provisions	Provision for Bad Debt	Provision for Diminution in Value of Inventories	Provision for Fixed Asset Impairment	Other Impairment Provisions
Degree of Importance	40	30	20	10
Number of Companies Drawing Impairment Provisions	58	33	5	10
Percentage	95.08%	54.10%	8.20%	16.39%

Table 3 Statistics of Impairment Provisions by Companies Listed on Main Board of Shenzhen Stock Exchange in 2011

After the weighted calculation, the average constraint is:

$40 \times 95.08\% + 30 \times 54.10\% + 20 \times 8.20\% + 10 \times 16.39\% = 57.54$. This means the constraint rate of the knowledge constraint to the sample is 57.54%. According to the law of large numbers, we can infer that the constraint rate of the knowledge constraint to the population is 57.54%.

Impact of interest shock:

According to statistics, the shares of tax revenues in China's fiscal revenues during 1995 to 2011 are shown in the following table:

Year	Share of Tax Revenues in Fiscal Revenues	Year	Share of Tax Revenues in Fiscal Revenues
1994	Above 98%	2003	92.18%
1995	96.73%	2004	91.55%
1996	93.28%	2005	90.93%
1997	95.18%	2006	89.79%
1998	93.79%	2007	88.89%
1999	93.35%	2008	88.43%
2000	93.93%	2009	86.91%
2001	93.38%	2010	88.11%
2002	93.3%	2011	86.49%

Table 4 Shares of Tax Revenues in China's Fiscal Revenue during 1995 to 2011

Chinese enterprises have to pay over twenty kinds of taxes, including VAT, tax for municipal maintenance and construction, educational surcharges, stamp duty, property tax, operation tax of vehicle and ship, city and town land use tax, corporate income tax, and so on, in which VAT accounts for 10% of enterprises' revenues. Enterprises also need to pay additional tax, water construction funds, employee water construction funds, employee education funds, five social insurances and one housing fund, and disabled person employment security fund. In total, these taxes account for 30%-40% of enterprises' revenues (China Value [CV], 2011). The Forbes Tax Misery Index for 2005 ranked China with the macro tax burden index of 160 second in the list of countries with heaviest tax systems. Because of such heavy tax burden, Chinese enterprises could obtain huge potential benefits through tax avoidance, which has great impact on the quality of accounting information. For this reason, this paper uses the size of the tax burden to measure the weight of interest shock.

Scholars and institutions have different opinions on the real level of China's macro tax burden. The fundamental reason is that they use different calculation methods. In October 2010, Xiao Jie, Director of State Administration of Taxation(Xiao,2010), based on the data for 2009 and using the statistical criteria of the International Monetary Fund (IMF) plus government funds and special charges of a tax nature, calculated the China's macro tax burden as about 30%. This figure is generally recognized. In 2010, China's total fiscal revenues grew by 21.3%, reaching RMB 8.3 trillion, plus the land grand fee of 2.7 trillion. With the GDP growth rate of 10.4%, China's macro tax burden in 2010 was at least grew by 2% from 2009. According to conservative estimate, the real level of China's macro tax burden in 2010 was 32% or more, and in 2011 was 35.96%, as shown in the following table:

Data in 2011	Tax Revenues	Nontax Revenues	Revenues from Government Funds	Revenue from State-owned Land Use Right	Revenues from Social Security Contributions	Revenues from Central State-owned Capital Operation Budget	GDP
Data	89720.31	14019.7	8193.39	33166.24	23700	765.02	471564

Table 5 Revenues of Chinese Government in 2011

Unit: 100 million RMB yuan

Total revenues of government=89720.31+14019.7 +8193.39+ 33166.24+23700+765.02= 169564.66

Macro tax burden=169564.66/471564=35.96%

The total revenues of government (including six kinds of revenues) are 16.956466 trillion yuan, accounting for 35.96% of the annual GDP. This means that on the basis of the overall revenues of government, the current macro tax burden level in China is 35.96%. This paper thus determines the impact of the tax shock as 35.96%.

Impact of cost shock:

For enterprises the cost control is very important, and almost all enterprises pay much attention to cost management. In the accounting practice of enterprises, the quality of accounting information disclosure is greatly affected by the cost of accounting. More adequate information disclosure means higher cost and higher information rating. Therefore, we can evaluate the shock of cost to the quality of accounting information through the assessment of the adequacy of the enterprises' accounting information disclosure. The Shenzhen Stock Exchange annually evaluates and rates the accounting information disclosure by listed companies in their annual reports. In 2011, the ratings of accounting information disclosure by 484 companies listed on the main board of Shenzhen Stock Exchange are shown in the following table:

Ratings	Excellent	Good	Pass	Fail
Marks	80	70	60	50
Number of Companies	56	324	88	16
Percentage	11.57%	66.94%	18.18%	3.31%

Table 6 Ratings of Quality of Accounting Information Disclosure by Companies Listed on Main Board of Shenzhen Stock Exchange in 2011

By calculation, the average ratings are:

80*11.57%+70*66.94%+60*18.18%+50*3.31%=68.68. The scoring rate is 68.68%. Therefore, the impact of cost shock is 68.68%.

Impact of collusion shock:

In order to influence investors' investment behavior and avoid the delisting because of failure to meet the statutory requirements on corporate earnings, the actual controllers, directors and financial officers of listed companies would deliberately delay disclosing companies' relevant information or disclose false information, such as pending actions, related transactions and corporate losses. To curb the occurrence of this phenomenon and protect the interests of investors, the stock exchange would establish credit files for every listed company and record the companies being punished or sanctioned. Therefore, we can determine the weight of the collusion shock by finding out the companies committing collusion through looking up these credit files. After reading the 2011 credit files of Shenzhen Stock Exchange, the author of this paper finds out that in 484 companies listed on the main board, 19 companies had been punished or sanctioned, of which 9 companies involved the collusion by directors, secretaries of board and financial officers. Therefore, the impact of collusion shock to the quality of accounting information is: $(484-9)/484=98.14\%$.

Model Construction of Empirical Logic

Explanation of Shock Models

Model of Knowledge Shock

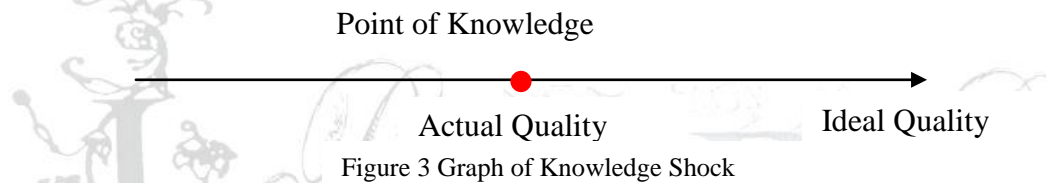


Figure 3 Graph of Knowledge Shock

As noted above, the knowledge constraint comes from providers and recipients of accounting information. For them this constraint cannot be changed through the repeated consideration of such factors as risk, benefit, and punishment. In other words, this constraint constitutes a “mechanic damage” to the quality of accounting information and causes the deviation of the actual quality of accounting information from the ideal quality.

Model of Interest Shock

When the conflict between the interest of enterprises and the fiscal interest of government occurs and given the lack of the effective constraint mechanism for government's fiscal and tax interest, enterprise would certainly cook the books to obtain the benefits from tax avoidance. The administrative regulations are the countermeasures to this behavior, including such measures as imposing fines and requiring enterprises to pay overdue taxes. The primary factor that affects the selection of accounting policy by enterprises is the consideration of enterprise's development, while regulatory policy is the secondary factor that affects the selection of accounting policy by enterprises (Lu, 2006). The punishment warning line as shown in Figure 4 represents the maximum administrative risk that an enterprise can bear.

In an extreme case, some small enterprises do not keep the basic accounting books, let alone maintain the quality of accounting information. In the model this is reflected by the interest equilibrium line that is continuously close to the interest axis. In such a case, the quality of accounting information is almost zero, and the enterprise can gain the largest benefits from tax avoidance. On the other hand, an enterprise preparing accounting statements fully in compliance with the statutory regulations may lose some benefits that are otherwise obtainable. In the model this is reflected by the interest equilibrium line that is continuously close to the horizontal axis. In such a case, the quality of accounting information is in the ideal state, while the benefit obtained by the enterprise is almost zero. In addition, the benefits from tax avoidance are obtained by the enterprises at the expense of the quality of accounting information. Therefore, the interest equilibrium line is a curve with negative slope.

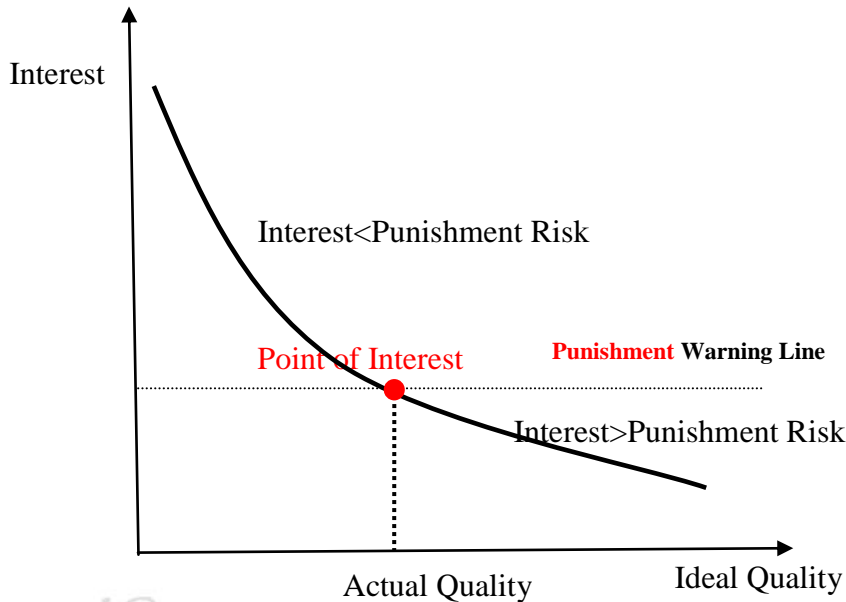


Figure 4 Graph of Interest Shock

When the benefit obtained by an enterprise through low-quality accounting information is lower than the risk it bears, the risk constraint will propel the enterprise to refrain from unethical behavior and to improve the quality of accounting information. This is reflected in the interest equilibrium line locating above the administrative warning line. When the enterprise's quality of accounting information is improved to a point that causes the lost benefit larger than risk, the enterprise will take the risk of avoiding tax in its business operations. This is reflected in the interest equilibrium line locating below the administrative warning line. Finally, the actual quality of accounting information will be inferior to the ideal quality as a result of the constant weighing of risk and benefit by the enterprise. In such a case, the point of interest shock is the point where benefit equals risk, namely, the shock of interest to the quality of accounting information.

Model of Cost Shock

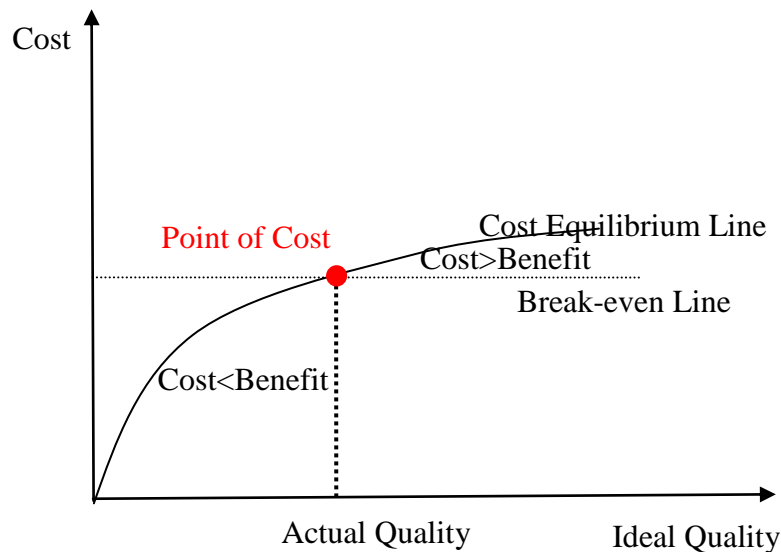


Figure 5 Graph of Cost Shock

In providing accounting information, enterprises must pay cost. However, once cost exceeds benefit, enterprises will stop paying cost. In Figure 5, the break-even line represents the maximum cost that an enterprise can pay in improving the quality of accounting information.

When the enterprise pays no cost, no accounting information can be obtained. Therefore, the cost equilibrium line affecting accounting information is a curve starting from the origin. With the increased cost inputs, the quality of accounting information will also continue to improve to a certain extent. Therefore, the cost equilibrium line is a curve with positive slope.

The improvement in the quality of accounting information will bring some benefits to the enterprise, such as more financing and stronger social recognition. When the cost incurred by the enterprise in providing accounting information is less than the benefits that can be obtained, it is worthy for the enterprise to input more cost. This is reflected in the cost equilibrium line locating below the break-even line. When the cost increasingly grows but the growth of benefit becomes less and less, the benefit obtained by the enterprise cannot cover the cost. In such a case, it is not worthy for the enterprise to input more cost. This is reflected in the cost equilibrium line locating above the break-even line.

Finally, the actual quality of accounting information will be at the point where cost equals benefit as a result of the constant weighing of cost and benefit by the enterprise. In such a case, the corresponding shock point represents the shock of cost to the quality of accounting information.

Model of Collusion Shock

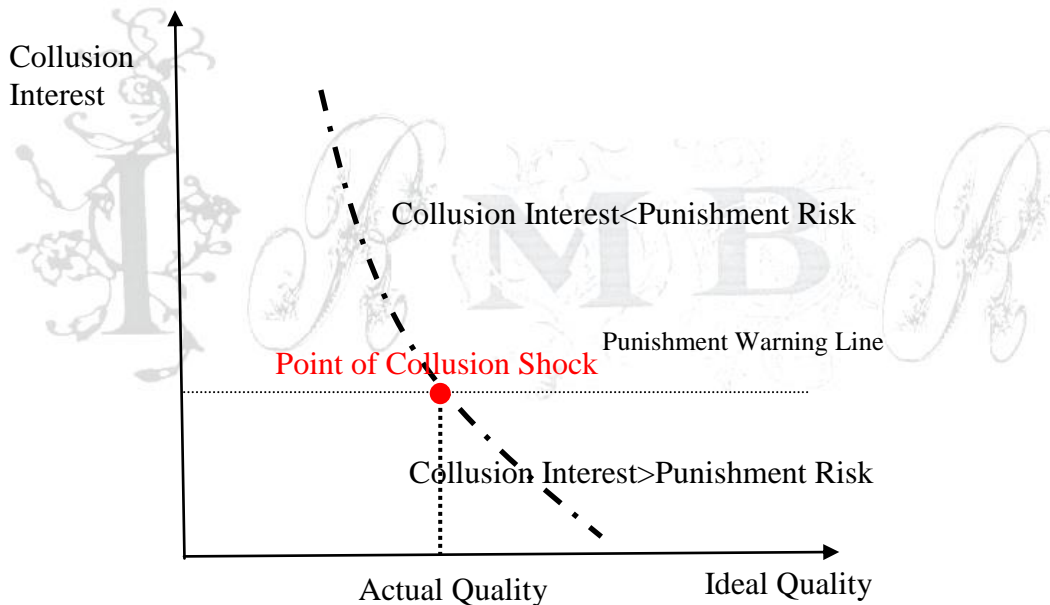


Figure 6 Graph of Collusion Shock

The model of collusion shock is very similar to the model of interest shock. However, because the benefits that could be obtained from collusion are limited, compared with the shock of tax interest, the impact of the collusion on the behavior of securities investors has a much smaller impact on the final net profits of enterprises. For this reason, the slope of the collusion equilibrium line is less than the slope of interest equilibrium line, and the impact of collusion on the quality of accounting information is smaller. This can explain why only less than 10 companies in 484 companies listed on the main board of Shenzhen Stock Exchange have committed the act of collusion to gain improper interests.

In addition, the collusion shock also involves the weighing of the benefits that could be obtained through collusion and the risk of punishment after the collusion has been found. This is also very similar to the model of interest shock. But one thing should be noted that the benefits that could be obtained from collusion are from the act of delaying information disclosure or making false information disclosure. This is different from the interest shock.

Construction of Comprehensive Model

The comprehensive impact of these four kinds of shocks on the quality of accounting information is shown in the following figure:

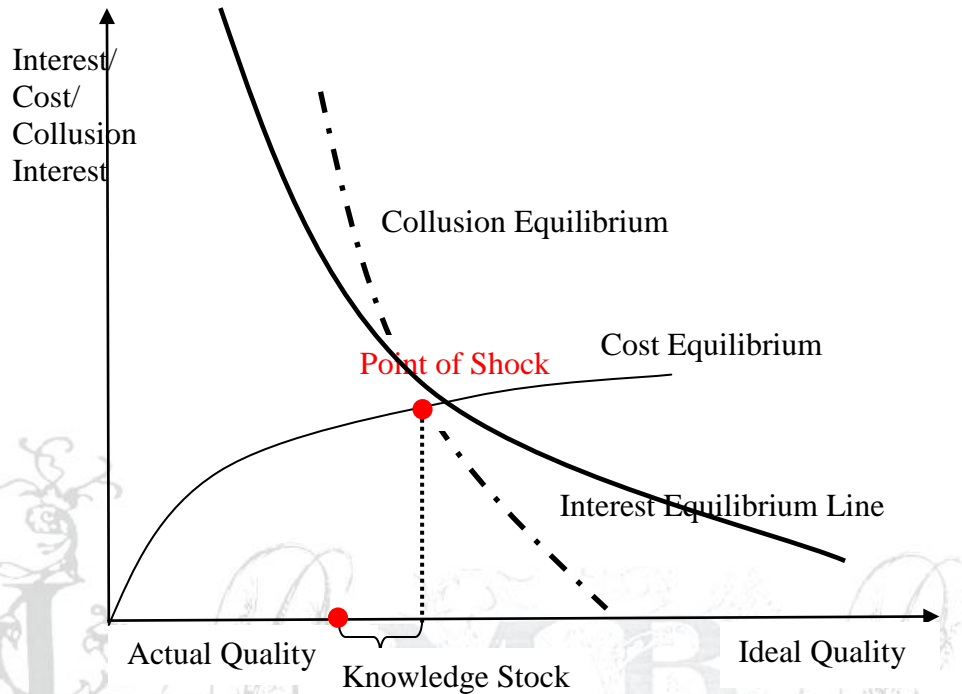


Figure 7 Graph of Impact of Four Shocks

The above Figure 7 shows the comprehensive impact of knowledge shock, interest shock, cost shock and collusion shock on the quality of accounting information. From this Figure we can observe that the combined effects of interest shock, cost shock and collusion shock result in the gap between the actual quality of accounting information and the ideal quality. But the final actual accounting information is also affected by the knowledge shock, which further widens the gap between the actual quality of accounting information and the ideal quality.

Estimation of Actual Quality of Accounting Information

The logical analysis of the impacts of four kinds of shocks on the quality of accounting information and the model construction reveal that each shock has different impact on the quality of information, and the weights of these shocks are different. Therefore, we adopt the weighted average methods to measure the actual quality of accounting information.

Firstly, we define the vector of weight as $W=(W_1, W_2, W_3, W_4)$, with $\sum W_i=1(i=1,2,3,4)$. The vector of the impact of these four shocks is defined as $A=(A_1, A_2, A_3, A_4)$. Thus the actual quality of accounting information is:

$$AQ=A*W=(A_1, A_2, A_3, A_4)* \begin{pmatrix} W_1 \\ W_2 \\ W_3 \\ W_4 \end{pmatrix}$$

Through the normalization treatment of the data regarding the impacts of these four shocks, we obtain the weights of four shocks: 260.32

$$(1) \text{ Weight of knowledge shock} = \frac{57.54\%}{57.54\% + 35.96\% + 68.68\% + 98.14\%} = 22.10\%$$

$$(2) \text{ Weight of interest shock} = \frac{35.96\%}{57.54\% + 35.96\% + 68.68\% + 98.14\%} = 13.81\%$$

$$(3) \text{ Weight of cost shock} = \frac{68.68\%}{57.54\% + 35.96\% + 68.68\% + 98.14\%} = 26.38\%$$

$$(4) \text{ Weight of collusion shock} = \frac{98.14\%}{57.54\% + 35.96\% + 68.68\% + 98.14\%} = 37.71\%$$

$$\text{i.e. } W = (W_1, W_2, W_3, W_4) = (22.10\%, 13.81\%, 26.38\%, 37.71\%)$$

$$A = (A_1, A_2, A_3, A_4) = (57.54\%, 35.96\%, 68.68\%, 98.14\%)$$

Based on the formula $AQ = A * W$, we estimate the actual quality of accounting information as 72.81%. Through the above logical reasoning and model construction, we can observe that because of the impact of these shocks, the actual quality of accounting information is only equivalent to 71.78% of the ideal quality of accounting information.

After conducting the fairness assessment of the semi-annual reports published by 114 ST listed companies in 2005, the Institute of Economic Observer found that the total non-recorded accrued losses of these companies were RMB 10.5394707 billion, and the adjustment rate of the fair pre-tax profit to the book profit before tax reached 393.95%. The non-recorded accrued losses were almost four times the book profit before tax. This indicates that there is great space for improving the fairness of the accounting information disclosed by companies (Institute of Economic Observer [IOEO], 2005). Thus it can be seen that the estimated figure in this paper, namely, the actual quality of accounting information equivalent to 72.81% of the ideal quality, is a rather conservative figure.

Conclusion and Limitations

Relevant Conclusions and Judgments

Through the reasoning of the empirical logic developed in this paper, we can draw the following conclusions:

(1) In the four negative variables that restrict and damage the effectiveness and quality of accounting information, each variable has different degree of impact. The interest shock has the largest negative impact on the effectiveness and quality of accounting information, followed by knowledge constraint, cost shock, and collusion shock.

(2) The knowledge constraint has the historic limitations. Its damage to the effectiveness and quality of accounting information should be considered in the course of history and cannot be changed through the weighing of the relevant factors.

(3) The impact of each of three variables (i.e. interest, cost and collusion) the effectiveness and quality of accounting information has an equilibrium point, which means the degree of the damage of these three factors to the effectiveness and quality of accounting information.

(4) Because of the interaction and co-existence of a number of affecting variables, there exists no ideal quality of accounting information. In the real world, the actual state of the quality of accounting information is always below the ideal standard of the quality of accounting information. The estimated figure in this paper, namely, the actual quality of accounting information equivalent to 71.78% of the ideal quality, is a rather conservative figure.

Limitations of the Study

In this study, there are several limitations listed below:

(1) Due to the lack of the systemic and public sources of direct data, we can only look for the data scattered on various media. Because the direct evidence is difficult to obtain, we have to use the indirect evidence.

(2) With respect to the sources of weight data, more affecting factors should be taken into consideration and the more representative sample size is needed. For instance, in the ratings of the quality of accounting information given by the Shenzhen Stock Exchange, cost is not the only factor that affects the quality of accounting information, but in this paper we do not take other factors into consideration; knowledge constraint does not only affect the provisions for asset impairment, and more aspects should be considered.

(3) No empirical study is done. This paper only selects four kinds of logical evidence (interest, knowledge, cost and collusion), and uses the logical reasoning method to validate the existence the logical empirical hypotheses. No study of the relevant empirical data has been performed.

References

- Andrew A., Jerold L. (1994): Efficient and Opportunistic Choices of Accounting Procedures: Corporate Control Contests, *The Accounting Review*, 69, 55-60.
- Changli, B. (2005): Marx's Social Conflict Theory and its Influence. *Journal of Changchun University of Science and Technology*, 18, 16-19.
- Changchun, Y. & Wenjing, Y. (2004): An Analysis of the Current Status of Provisions for Asset Impairment by Listed Companies, *Chinese Chief Accountants*, 11,32-35.
- China Value.(2011): Tax Misery Suffered by Chinese Enterprises, *Board of Directors*.
- Ding ding, W. (2011): *Lectures on Behavioral Economics*, Shanghai People's Publishing House, 1, 78-85.
- Feng, L. (1996): *Research on Accounting Standards*, Press of Dongbei University of Finance and Economics.
- Fengxiang, D. (2002): An Economic Analysis of Firm's Selection of Accounting Policy, *Accounting Forum of Accounting School of Zhongnan University of Economics and Law*.
- Hebert, S. (2004): Review of Hebert Simon's Theory of Bounded Rationality. *Journal of China University of Geosciences*, 25(6), 10-15.
- Institute of Economic Observer, (2006): air Bad Debt Provisions: Dispel Misgivings about Accounting Changes, *Economic Observer*.
- Institute of Economic Observer, (2005): Tip of the Iceberg: Book Loss of ST Listed Companies, *Economic Observer*.
- Jiajia, Z. & Hua, B. (2007): The Cost-benefit Analysis of Cost Accounting Information, *Finance and Accounting Communication*,8,11-15.
- Jieming, L. (2008): The Cost-benefit Analysis of Firm's Cost Accounting Information, *Economic Perspectives*, 8, 79-80.

- Jiandong, B. (2012): Native Perspective of Accounting Policy: Background, Conflict and Non-Cooperative Game, *Research on Frontier Issues of Accounting*, 59-69.
- Jianhua, X. (1988): *Compilation of the Latest International Standards for Quality Management and Quality Assurance*, China Standard Press, 42,115-116.
- Jie, X. (2010): Avoiding Misunderstanding of Macro Tax Burden, *China Reform*, 10.
- Kahneman, D. (1979): Prospect Theory: An Analysis of Decision under Risk, *Econometrical*, 47(2), 263-292.
- Liren, A. & Youmin, X. (2004): An Analysis of Individual Judgment Ability and Voting Rules in Collective Decision-making, *Journal of Humanities*, 5,18-25.
- Ling, M. (2013): On the Huge Loss of Tax Revenues in Underground Economy and Relevant Countermeasures, *Guangzhou Office of the National Audit Office of China*.
- Mei, L. (2006): An Empirical Analysis of the Factors Affecting Selection of Accounting Policy by Firms, *Journal of Shanxi University of Finance and Economics*, 28(21): 78-180.
- Qinglin, K. (2002): On the System of Characteristics of Accounting Information Quality, *Fiscal Theory and Practice*, 54, 66-146.
- Ross L. W. & Jerold L. Z. (2006): *Positive Accounting Theory*, Press of Dongbei University of Finance and Economics.
- Renbo, C. (2012): Application of Prospect Theory in Empirical Study of Financial Accounting, *Friends of Accounting*, 9, 55-61.
- State Statistics Bureau, (2011): *China Statistical Yearbook*, China Statistics Press, 56-78.
- Shouning, T. (1995): Administrative Consensus: An Explanation on the Reform of Public Institutions in China, *Chinese Social Sciences Quarterly*, 13(5).
- Shenzhen Junhexin Investment Management Consulting Co., Ltd., (2012): Mental Stress of Accounting Practitioners, *the Company's website*.
- Xiaosheng, W. & Guoyin, W. (2004): On the Relationship between Two Major Characteristics of Accounting Information Quality, *Journal of Zhejiang Industry & Trade Vocational College*, 23(3), 37-44.
- Xiao bin, Z. & Manikin. (2000): The Empirical Study of China's Underground Economy, *Statistical Research*.
- Yeqing, C. (2006): Ethical Reflection on Prisoner's Dilemma of Accountants, *Friends of Accounting*, 5, 12-17.
- Yunfang, L. (2010): The Hierarchical Nature of Group Collusion and Its Impact on the Quality of Accounting Information, *Explorations of Economic Issues*, 10, 70-74.