The Evaluation System of Accounting Information Quality Based on Balanced Scorecard

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Abstract—With the rapid progress of China's capital market reform, the quality of corporate accounting information has gradually become a focus of attention from all walks of life, especially the financial community. How to accurately and objectively evaluate the quality of accounting information has become a problem that needs to be solved in the capital market. Based on the balanced scorecard analysis framework, this paper constructs an evaluation index system for accounting information quality from four dimensions: financial affairs, customers, internal process, and learning and growth. Factor analysis method is used to comprehensively evaluate the accounting information quality of listed companies in A stock market of Shenzhen Stock Exchange from 2015 to 2019, and then the results of disclosure assessment of Shenzhen Stock Exchange are used to test the evaluation conclusions, the results show that the method has strong rationality and applicability.

1 INTRODUCTION

Since the 19th National Congress of the Communist Party of China, high quality economic development has become the new trend and the main theme of China's economic reform and development, and the quality of accounting information, which is an important basis for evaluating the quality of economic development, has also become a hot spot for social scholars' attention and research. The Fourth Plenary Session of the 19th CPC Central Committee clearly put forward the requirement of "optimizing the basic database of economic governance", which has put the research of accounting information quality in a more prominent position. As an important basis for the effective operation of the social economy, the quality of accounting information affects the efficiency of resource allocation, which in turn has a significant impact on the quality of national economic development and governance capacity.

For a long time, the quality of accounting information has been a hot topic of research for scholars at home and abroad, and digging out the indicators that can objectively reflect the

quality of accounting information has always been the focus of research. Based on the balanced scorecard analysis framework, this paper evaluates the quality of accounting information in four dimensions: financial affairs, customers, internal business process, and learning and growth, and accordingly selects relevant financial and non-financial indicators to construct an accounting information quality evaluation index system and verify its applicability.

2 LITERATURE REVIEW

Early studies on the quality of accounting information have been qualitatively evaluated by domestic and foreign scholars in the context of accounting standards or the conceptual framework of financial accounting. For example, the Financial Accounting Standards Board (1980)[1]has proposed "decision usefulness" as a criterion for evaluating the quality of accounting information from the perspective of users' needs in SFAC 2.And former SEC Chairman Levitt (1998)[2], oriented to protect the interests of investors, proposed in "The Importance of High Quality Accounting Standards" that the main characteristics of measuring the quality of accounting information include fairness, integrity, comparability, transparency, and adequate disclosure. These qualitative descriptions provide a certain basis for scholars to study the quantitative evaluation of accounting information quality, such as the quantitative evaluation method of accounting information quality represented by the perspective of accounting information quality characteristics. Wang (2015) [3]constructed an evaluation index system of accounting information quality under the background of big data, based on the four characteristics of accounting information quality. In addition, in empirical research, accounting information quality is most commonly measured from the perspective of earnings quality. Scholars such as Li (2016)[4] and Li (2020) [5]used earnings quality as a proxy variable to test the role of accounting information in the capital market, its impact on stakeholders, and the play of resource allocation efficiency. Meanwhile, many scholars at home and abroad evaluate the quality of accounting information from the perspective of accounting information disclosure quality, such as the representative Standard & Poor's transparency and disclosure ratings, the American Investment Management and Research Association disclosure ratings, the International Center for Financial Analysis and Research disclosure ratings as proxy variables for the quality of accounting information. In addition, there are other perspectives, such as number of fraud (Liu et al.,2003) [6], the audit opinion (Gong et al., 2009) [7] and abnormal audit fees (Chen, 2018) [8], etc as the proxy variables of accounting information quality.

On the whole, most scholars use earnings quality and accounting information disclosure quality ratings to replace the quality of accounting information to solve the problem of the difficulty of directly measuring accounting information quality, and most of the studies focus on the characteristics of accounting information quality in a certain aspect, which cannot meet the measurement requirements of multiple aspects, affecting the systematicness of the research. In view of the shortcomings of these studies, this paper constructs a balanced scorecard-based accounting information quality evaluation index system, which enriches the measurement methods of accounting information quality.

3 EMPIRICAL RESEARCH DESIGN

3.1 Variable Setting

1)   Financial dimension

From the perspective of accounting information quality, it mainly controls the cost of accounting work and enhances the benefits that accounting information can bring, thus increasing the value of accounting information. The firms with higher audit fees engage in more accrual activities, making accounting information less valuable. At the same time, high accounting information quality will not only bring economic benefits to the company, but also improve the corporate image to inject strong capital vitality into the company.

2)   Customers dimension

'The quality of accounting information refers to the sum of the characteristics that accounting information meets the needs of information users'(Xu et al., 2012)[9]. 'High quality of accounting information enhances the satisfaction and loyalty of information users, thus improving the credibility of the company'(Liang, 2014)[10]. While the credibility of a company can be reflected in its capital accumulation and growth capability.

3)   Internal process dimension

The enterprise asset utilization rate is a concrete expression of the enterprise's operating capacity, which can well reflect the effectiveness of the implementation of the enterprise internal control system. In addition,'cash flow is more indicative of operating conditions and development strength than the commonly used profit indicators, and best reflects the essence of the company'(Shen, 2015)[11].

4)   Learning and growth dimension

Financial personnel as the main body of accounting work, the company should have an appropriate proportion of financial personnel, which can ensure the normal operation of accounting and supervision. In addition, if the financial personnel lack the professional ability of screening and processing data, it will affect the authenticity and relevance of accounting information, so enterprises should focus on the training of professional knowledge and practical skills of employees to enhance the comprehensive quality to improve the quality of accounting work.

Table 1 Balanced score card index system

dimension	Indicators
Financial	the proportion of audit expenses, asset-liability ratio, operating profit margin and growth rate of shareholders' equity
Customers	the growth rate of total assets, the growth rate of operating income
Internal process	current assets turnover, asset cash recovery rate and sales cash ratio
Learning and	the proportion of labor union and employee

growth	education expenditure, the proportion of financial personnel and the profit per capita

3.2 Factor analysis

According to the evaluation index system of accounting information quality constructed above, financial data and non-financial data related to the evaluation of accounting information quality are obtained. In this paper, SPSS21.0 is used to make a comprehensive analysis of the relevant data, in order to obtain the score of accounting information quality factor and its comprehensive ranking of A-share sample companies in Shenzhen Stock Exchange. From 2015 to 2019, this paper carried out factor analysis on 12 indicators selected from A stock market of Shenzhen Stock Exchange every year, and all of them passed Bartlett's spherical test. Due to space limitations, only the final comprehensive score of accounting information quality of the top 10 and bottom 10 sample enterprises of Shenzhen A-share in 2019 is listed:

Table 2 Accounting quality score of sample companies

The top ten		The bottom ten	
Stock Code	Z Score	Stock Code	Z Score
002761.SZ	7.6035	300139.SZ	-1.5352
002015.SZ	4.8798	300208.SZ	-1.5721
002459.SZ	4.2751	300300.SZ	-1.7054
000785.SZ	2.7629	300467.SZ	-1.9540
000708.SZ	1.9818	002370.SZ	-2.1088
002234.SZ	1.7002	300336.SZ	-2.1691
300059.SZ	1.6770	300309.SZ	-2.2337
000858.SZ	1.4166	300189.SZ	-3.3590
000035.SZ	1.1688	002619.SZ	-4.0634
000672.SZ	1.1034	300362.SZ	-4.1003

From Table 2, we can see that score of accounting information quality up to 7.6035, indicating that the financial quality of these listed companies is good. The scores of accounting information quality of the last ten enterprises are all less than -1, indicating relatively poor accounting information quality. Among them, the lowest score is -4.1003, indicating a relatively large gap in accounting information quality scores.

4 EMPIRICAL TEST AND RESULT ANALYSIS

In order to investigate the rationality and practicability of the evaluation index system of accounting information quality established in this paper, a regression analysis was conducted between the comprehensive accounting information quality score and the information disclosure evaluation results of Shenzhen Stock Exchange. The definitions of all variables are shown in Table 3.

Table 3 Definition of variableses

Variable Types	Variable Symbols	Variable Name	Variable Definitions
Dependent variable	Disc	Information disclosure evaluation results	The assessment results A, B, C and D are assigned 4, 3, 2 and 1 respectively
Independent variable	AIQ	Accounting information quality	Based on the index evaluation system constructed in the previous section
	Size	Company Size	Natural logarithm of total assets at the end of the year
	Big10	Shareholding Concentration	Total shareholding ratio of top ten shareholders
	State	Nature of ownership	State-owned enterprises take 1, non-state-owned enterprises take 0
	Roa	Return on assets	(profit+Interest expense)/Average assets
	Doa	Debt-to-assets	Total liabilities/Total Assets

4.1 Sample descriptive statistics

The results were shown in Table 4. The average value of Disc is 3.049 and the median is 3, indicating that the quality of information disclosure of most sample companies is good and above the average. The mean value of AIQ is -0.001, indicating that the sample enterprises have great room for improvement in accounting information quality. The minimum value is -7.984, and the maximum value is 8.873, indicating that the accounting information quality of different enterprises varies greatly. In terms of control variables, the total assets of listed enterprises in the sample are relatively similar, and the difference in the size of enterprises is small, and the top 10 shareholders of the sample listed companies have similar shareholding ratios and high concentration, and non-state-owned enterprises are the majority of the sample enterprises, and there is a large gap in the profitability of different enterprises, and the average value of Doa is 40.788, indicating that the risk structure of the sample enterprises is reasonable.

Table 4 Results of descriptive statistics of the sample

	Sample size	Minimum value	Maximum value	Average value	Standard deviation	Median
Disc	6555	1.000	4.000	3.049	0.639	3.000
AIQ	6555	-7.984	8.873	-0.001	0.476	-0.010
Size	6555	18.287	27.562	22.199	1.120	22.087
Big10	6555	16.300	95.070	56.505	13.826	57.130
State	6555	0.000	1.000	0.255	0.436	0.000
Roa	6555	-183.981	58.702	5.129	8.236	5.088
Doa	6555	1.740	326.190	40.788	20.282	39.534

4.2 Pearson correlation analysis

As shown in Table 5, from the perspective of the size of the correlation coefficient, there is no positive or negative multicollinearity problem between the variables, and the choice of

variables is reasonable. Secondly, in the preliminary test of the relationship between the variables, AIQ and Disc are positively correlated at the 1% level, indicating a significant positive correlation between the quality of accounting information and the results of information disclosure assessment. Both Big10 and Roa did not pass the significance test with State, indicating that neither the percentage of shares held by the top ten shareholders nor the total return on assets is related to the nature of the firm.

Table 5 Pearson correlation coefficients

	Disc	AIQ	Size	Big10	State	Roa	Doa
Disc	1						
AIQ	.254**	1					
Size	.182**	.274**	1				
Big10	.129**	.172**	.115**	1			
State	.095**	.117**	.295**	-.015	1		
Roa	.347**	.542**	.098**	.159**	-.020	1	
Doa	-.142**	-.067**	.482**	-.041**	.225**	-.240**	1

4.3 Regression analysis

This paper used Ordered Logit model to test the effect of accounting information quality on the results of information disclosure appraisal and analyzed its significance.

Table 6 Ordered logit regression results

	Regression coefficient
AIQ	0.138
	(1.980*)
Size	0.464
	(15.534**)
Big10	0.009
	(4.547**)
State	0.392
	(6.208**)
Roa	0.073
	(17.777**)
Doa	-0.023
	(-14.069**)
Likelihood ratio test	$\chi^2(6)=1260.918, p=0.000$
McFadden R2	0.102

Table 6 lists the regression analysis results. The Chi-square value of the model established in this paper is 1260.918, and the probability value is 0.000, which is significantly less than 0.05, indicating that the independent variables put in are valid and this model construction is meaningful. The regression coefficient between the Disc and the AIQ is 0.138, and it passes

the significance test at 5% level, indicating that there is a significant positive relationship between disclosure assessment results and accounting information quality. The scale of the enterprise, the shareholding ratio of the top ten shareholders, corporate nature and the rate of return on total assets are significantly and positively correlated with the information disclosure evaluation results at the level of 1%, while the asset-liability ratio is significantly and negatively correlated with the information disclosure evaluation results. The McFadden R-Square is 0.102, which indicates that the fitting degree of the model is acceptable. Therefore, the regression results verify the rationality of the evaluation index system of accounting information quality based on the balanced scorecard.

5 CONCLUSIONS AND SUGGESTIONS

In this paper, the evaluation index system of accounting information quality is constructed from the perspective of balanced scorecard, the relevant financial and non-financial indicators are selected, and the factor analysis method is used to evaluate the accounting information quality of listed companies. Then, the rationality of accounting information quality evaluation is tested by using the information disclosure evaluation results of Shenzhen Stock Exchange. The results show that this method has strong feasibility and applicability. This provides some reference value for stakeholders to evaluate the quality of corporate accounting information. This paper puts forward three suggestions on the use of accounting information quality evaluation index system by enterprise managers, accounting information users and supervision departments.

5.1 Enterprise managers' perspective

According to the actual business operation, enterprises can find out the deficiencies in customers, internal processes, learning and growth, and finance in the process of evaluating the quality of their accounting information, so as to take corresponding measures to improve the quality of enterprise accounting information.

5.2 Accounting information users' perspective

Users of accounting information can use the evaluation index system to get specific scores of accounting information quality and rank the quality of accounting information of listed companies, which enhances the objectivity of accounting information users to evaluate the quality of accounting information of companies and provides intuitive and comparable basis for investment or management decisions.

5.3 Market Supervisors' Perspective

Market regulators can review and evaluate the quality of a company's accounting information disclosure from four dimensions: customers, internal processes, learning and growth, and financial aspects to analyze the company's accounting management loopholes and urge the company to rectify the deficiencies in accounting information, so as to provide users of accounting information with truly useful and reliable accounting information.

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