

An empirical study on information content of accounting earnings and cash flow

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Abstract: Based on deep analyzing the colluding and checking relation of income statement and cash flow statement, this paper chooses and designs the corresponding profit index, carries on the comparative study of information content between accounting earnings and cash flows. The paper utilizes the financial data of Chinese listed company in manufacturing industry from 2003 to 2005, adopts the price model and analyzes empirical study about two kinds of profit indexes and value relevance. Studies have suggested: accounting earnings and cash flows all have relevant relations to stock prices; however, the relevance between cash flow and stock price is stronger, and cash flows have higher information quality.

Key words: accounting earnings; cash flow; earnings index; listed company; value relevance

1. Introduction

The information content question¹ of accounting information has been the focus that people pay close attention to all the time. In an effective capital market, it is available that accounting information impacts on stock price. The higher the quality of accounting information is, the more helpful it is for investors to assess the company's value accurately.

Ball and Brown (1968) conducted some research to the relation between accounting surplus information and stock price earlier. They found the information of accounting surplus is useful. Accounting surplus has certain connections with stock price. Kormendi and Lipe (1987) stated that there are positive correlation relations between accounting surplus and stock return. Ohlson (1995) indicated that there are relevant relations between accounting information such as net assets and stock price. Thereafter, some scholars added the factor of cash flow to study gradually, found that there are all certain relevance between surplus information and cash flow and stock price. Beaver, et al (1982) showed that there are prominent relevant relations between cash flow and stock return. CHENG, et al (1996) discover that accounting surpluses and cash flow all possess the explanation strength to stock return. Moreover, some Chinese scholars such as WANG Hua-cheng (2004), CHENG Xiao-ke and TONG Yan (2004), ZHAO Chun-guang etc (2004) state that accounting surplus, cash flow and stock price have relevance relations.

Since accounting information including accounting surplus and cash flow can transmit relevant information to capital market and the information have certain explanation strength to stock price, the question is which kinds of accounting information include higher information quality and can transmit important information to investors

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¹ Lev (1989) denotes that if the change of stock price or trade volume can attribute to special information, then such information is considered useful and has certain information content. It usually expresses value relevance. The stronger value relevance is, the higher information quality is.

for their decision-making. At present, domestic and international scholar haven't unified final conclusion about information content of accounting profit and cash flow. (Bernard and Stober, 1989; Penman and Souglannis, 1998; Francis, etc., 2000; LIU Yun-zhong, 2003). So this paper further compares two kinds of information content level by an empirical study on accounting surplus and cash flow index.

2. Index designing

Relevant scholars (Rayburn, 1986; Easton and Harris, 1991; SUN Ai-jun and CHEN Xiao-yue, 2002) often utilize accounting surplus or cash flow information to compare directly while studying information content of accounting surplus, such as net profit or net cash flow index etc. Because accounting profit is inconsistent with cash flow in calculating, it's unable to compare the information content level directly. We need analyze the colluding and checking relation of profit table and cash flow statement in depth, design the corresponding accounting surplus and cash flow index. It benefits make the calculation keep unanimity and comparative analysis.

In various accounting information, company's profit ability is usually thought by the market as the key information richest in the information content. Among them, earnings per share (EPS) and return of assets (ROA) are the two most important ratios on accrual basis, which reflects the profitability of company's common stock and total assets respectively. Based on the cash flow financial ratios, we design two corresponding ratios-cash earnings per share (CEPS) and cash return on total assets (CROA), see Table 1.

Table 1 The comparison of two types of earnings ratios

Earnings ratios of accrual basis		Earnings ratios of cash basis	
Variable	Formula	Variable	Formula
Earnings per share (EPS)	Net profit/total stakes	Cash earnings per share (CEPS)	(Net operating cash flow-current depreciation of fixed assets-amortization of intangible assets-amortization deferred charges-interest expense and cost of raising funds in cash + investment income in cash)/total equity
Return of assets(ROA)	(total profits + net interest expense)/the average of total assets	Cash return of assets (CROA)	(Net operating cash flow-current depreciation of fixed assets-amortization of intangible assets-amortization deferred charges + investment income in cash +income tax in cash)/the average of total assets

3. Empirical study on information content

3.1 Model design

Because the level of profit ability will exert a significant influence on company's current profits and future dividend, the market will strongly react in profit information of higher quality. Thus company's stock price will go up with the improvement of information of profit quality. The higher the information quality of accounting surplus is, the stronger the value relevance of accounting information is. In studying models about accounting information and value relevance, there are mainly two kinds: price models and income models. Price models regard stock price as dependent variable, and study the relation of stock price and accounting information content. Income models regard stock bonus as dependent variable, and study the relation of stock bonus and accounting information change.

In fact, both price models and income model are derived from valuation model of future cash flow

discounted. That formula is $p = \sum_{i=1}^{\infty} [d_i / (1+r)^i]$, which is based on the assuming that current accounting surplus contains the expected cash flows in the future (Lev, 1989). However, from the market view the current accounting information can be divided into unexpected and expected information respectively. Income model embodies the factors that determine company value change and reflect the timeliness of accounting information. In income model, expecting information is clearly irrelevant to stock return, which easily causes the error in choosing dependent variables and the deviation in the result, which makes the income model have weak explanatory potential. But price model embodies the factors that determine company value. In price model, the current stock price reflects the cumulative accounting information and does not have the dependent variable error. So the results from the price model are more reasonable.

Based on Ohlson (1995) model, we hereby choose price model to study value relevance of accounting information. We also set up the multiple regression models respectively according to the financial ratios of accrual basis and cash basis as follows:

Model (1): $P = \beta_0 + \beta_1 \text{EPS} + \beta_2 \text{ROA} + \varepsilon$;

Model (2): $P = \beta_0 + \beta_1 \text{CEPS} + \beta_2 \text{CROA} + \varepsilon$;

Where P is stock price, ε represents the random error.

3.2 Sample selection

The important prerequisite for accounting information that affects stock price is that the capital market is effective. That is, all historical information has been reflected in stock price, investors can make accurately and timely adjustments for the future surplus and expected return, and stock price is equal to the intrinsic value of the company. The development of China's stock market is not perfect and mature, as well as is highly speculative in the 1990s; so there is a greater departure from stock price to company value. The market made great adjustments in 2001, and then the average rate of price per book value in capital market fell for 2-3 times from 2003 to 2005. Stock price (considered the price adjustment after dividends) is close to the intrinsic of company value, but stock price that has risen sharply in 2006-2007 is much higher than the intrinsic value. Therefore, our study period is from 2003 to 2005 and study samples are the listed companies of China's manufacturing sector.

Considering the necessity of the design, we deal with the sample data as follows: (1) to exclude the B-share companies; (2) to remove the company with incomplete information; (3) to remove the companies with an abnormal numeral. The stock price is the closing price of Dec. 31 of the year and calculated by considering the adjustment after dividend. Finally, we get 642, 697 and 745 samples in 2003, 2004 and 2005 respectively. The data used in our analysis is provided by Wind database and we use the SPSS13.0 for statistical analysis.

3.3 Basic statistical analysis

Table 2 reports the descriptive statistics for the variables. In addition, correlation coefficient about EPS, ROA, CEPS and CROA of the company and stock price are 0.294, 0.27, 0.312 and 0.325 respectively in 2003 (The results have the same pattern in 2004 and 2005, so omitted), which indicates that there are certain relevant relations between two kinds of profit indexes and stock prices.

3.4 Empirical analysis

In this paper, we use independent variable with step-by-step method to conduct multiple linear regressions for stock price based on sample data from 2003 to 2005 respectively. See the statistics results in Table 3, omitting the results of 2004 and 2005 because they are from the same pattern. The results show that all independent variables are tested through the model except for EPS in model (1) in 2003 and ROA in model (1) in 2005. In

addition, the tolerance of every independent variable in models is more than 0.3, which indicates there is no argument on the apparent co-linearity; the statistics like Durbin-Watson and residual volume meet the requirements of the multiple linear regression equation, and the model is well fitted.

Table 2 Descriptive statistics for the variables (2003)

Statistics	Stock price	Earnings ratios of accrual basis		Earnings ratios of cash basis	
		EPS	ROA (%)	CEPS	CROA (%)
Sample	642	642	642	642	642
Mean	4.165	0.175	5.148	0.050	4.182
Median	3.852	0.150	5.240	0.038	3.166
Standard deviation	1.757	0.292	5.83	0.272	8.388
Minimum	1.25	-1.27	-22.02	-1.09	-21.91
Maximum	14.62	1.94	25.72	1.36	36.37

Table 3 Regressions of two types of earnings ratios and stock price in 2003

Variables	Regressions of model (1)			Regressions of model (2)		
	Intercept	EPS	ROA	Intercept	CEPS	CROA
Coefficient	3.893	0.021	0.053	3.982	0.735	0.035
t statistic	42.684***	0.255	4.518***	49.981***	1.663*	2.437**
P-value	0.000	0.799	0.000	0.000	0.097	0.015
Coefficient of adjusted determination R ²		0.029			0.07	
Durbin-Watson		1.966			1.928	
Tolerance					0.308	
Fstatistic		20.41***			25.056***	
P-value		0.000			0.000	
Residual histogram	Approximate normal distribution			Approximate normal distribution		

Notes: *** indicates significant at 1% under two-tails test; ** indicates significant at 5%; * indicates significant at 10%.

The studies for 2003-2005 have suggested: Of all, the two types of ratios are related to stock price, which is similar to previous findings. However, comparing the coefficient of adjusted determination in model (1) and (2), we find that the coefficients in model (1) is lower than model (2) (It is 0.029 and 0.07 respectively in 2003, 0.09 and 0.11 in 2004, 0.102 and 0.129 in 2005), which shows that financial ratios on cash basis is more relevant to firm value and has a higher quality information than the financial ratios on accrual basis.

4. Conclusion

This paper carries on the comparative study on information content of accounting surplus and cash flow. Through analyzing in depth the colluding and checking relation of income statement and cash flow statement, the paper chooses and designs profit index of accounting surplus and cash flow. The paper regards the listed companies of manufacturing industry in our country from 2003 to 2005 as samples, adopts price model to examine value relevance of two kinds of profit indexes and stock price respectively. Studies have suggested: Though relevant relations exist with stock price in both accounting surplus and cash flow, the relevance of cash flow and stock price is stronger. Cash flow has higher information quality.

Certainly, there is certain limitation in the research, we will further study in the future: (1) This paper only adopts the samples of the listed companies of manufacturing industry in our country, not considering whether the trade factor will influence the information content of accounting surplus and cash flow. So we can conduct studies sector by sector, and compare the difference about message content of accounting surplus and cash flow of different sectors; (2) This paper has only chosen the EPS and ROA as the indexes of accounting surplus. We can also combine other indexes to compare information content of accounting surplus and cash flow.

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