# Re-examining the Operating Performance of China's Listed Companies with Unexpected Earnings Disclosure

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## 1. INTRODUCTION

Studies analysing the relationship between five forces of financial indices and companies' operating performance have been carried on for a long period. Financial ratios are used by managers, creditors, current and potential stockholders. However, a complete analysis of financial indices about the relationships with financial statement information disclosure in the stock market has not yet been worked empirically by practitioners and academics. They usually neglected the financial statement information and the quality of accounting's timeliness. Consequently, financial distress companies will spread the good news and slow the bad news in earnings disclosure. The longer the delay in announcing earnings, the greater the magnitude of information that will leak to large shareholders.

Evidence provided that delayed announcements of annual earnings more often convey bad news (i.e., lower than expected earnings) than do early announcements. Companies would delay the announcement when the actual earnings are less than the earnings forecasts (bad news) (Kross, 1981). Conversely, they would announce the earnings earlier when the actual earnings are better than the earnings forecasts (good news). This finding of the conclusion is the same as Beaver (1968) did before. Givoly & Palmon (1982) examine the relationship between the information content of accounting reports and timeliness. They find that bad news tends to delay the announcement of earning reports. Chambers & Penman (1984) provide descriptive evidence on the relationship between timeliness of earnings reports and stock price at the time of announcement. When reports are published earlier than expected, they tend to have larger price effects than when they are published on time or later than expected. Further, unexpectedly early reports are characterized by good news, whereas unexpectedly late reports tend to endure bad news. Moreover, consistent with Chambers & Penman (1984), Chinese listed companies unexpectedly speed the announcement of good news and delay the disclosure of bad news relative to their previous reporting pattern. Besides, there is a significant price reaction to the annual earnings announcements for both early (good news) and late (bad news) reporting companies (Haw et al., 2000; Chen et al., 2005; Wang & Lin 2006).

The above indicates that stocks with positive earnings surprises outperform stocks with negative earnings surprises over the next 12 months (Foster et al., 1984; Bernard & Thomas, 1990; Chan et al., 1996). This finding is popularly referred to as the post-earnings announcement drift (Easton & Harris, 1991; Huson et al., 2001).

Since 1998, the stock exchange centers in Shanghai and Shenzhen have classified listed companies as special treatment companies if operating abnormality happened. Investors could avoid embarrassment in judging the companies' prospects, and decrease their investment loss. Typically, one company will become "special treatment" if following condition is satisfied: a listed company gets negative net profits for recent consecutive fiscal years. As China's special definition of financial distress, this article qualifies net income ratio as operating performance. Particularly, we compare earnings disclosure with five forces (Profitability; Productivity; Activity; Growth; Stability) of financial indices, which is better model to explain about companies' operating performance. Using the panel data regression with fixed effect that replaced related literatures to the financial statement disclosure use the ordinary least square method to construct the most proper model. According to the results, the earnings disclosure makes a notable impact (more than financial indices) on companies' profitability.

The paper is organized as follows. Section 2 sets out methodology. Empirical findings are given and interpreted in section 3 and concluding remarks are made in Section 4.

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## 2. METHODOLOGY

### 2.1 Sample and Variable Description

The sample selection type of this paper is panel data set including 47 companies (manufacturing industry) in Shanghai and Shenzhen Stock Exchange over the period 2000-2004. The database sources are taken from the Taiwan Economic Journal Database (TEJ). The statistics testing applies Lagrange Multiplier test (LM-test), F-test and Hausman test to determine the best statistic statistical model. We select variables which are more significant to follow previous studies (Baker, 1973; Shimerda, 1978; Chen & Shimerda, 1981) are presented in Table 1.

**Table 1 : Variables Description**

| Financial Dimensions | Independent Variable | Calculation | Application |
|---|---|---|---|
| Earning News | Standardized Unexpected Earnings (SUE) | $\frac{e_{iq} - e_{iq-4}}{\sigma_{it}}$ | When SUE > 0 indicates that the company has good news. Conversely, SUE < 0 indicates that the company has bad news. |
| Stability | Liabilities Ratio ($X_1$) | Total Liabilities / Total Assets | High debt/asset ratio may indicate a company that can't pay its bills. |
| | Acid-test Ratio ($X_2$) | (Current Assets-Inventories) / Current Liabilities | This ratio measures ability to pay current liabilities from the most liquid current assets. The higher the quick ratio, the better the position of the company. |
| | Operating Expense Ratio ($X_3$) | Operating Expenses/ Revenue | The ratio is an indicator of how efficiently a property is being managed. The lower the operating expense ratio, the greater the profit for the investor. |
| Profitability | Per Share Pre-tax Income ($X_4$) | (Net Income Pre-tax-Dividends on Preferred Stock)/ Weighted Average Number of Shares | The higher per share pre-tax income, the greater the profit for the shareholder. |
| | Total Asset Turnover Ratio ($X_5$) | Net Sales / Average Total Asset | Asset turnover measures a company's efficiency at using its assets in generating sales or revenue. |
| Operating Performance | Equity Turnover Ratio ($X_6$) | Net Sales / Average Shareholders' Equity | The higher equity turnover, the more efficiently a company is using its capital. |
| | Accounts Receivable Turnover Ratio ($X_7$) | Net Sales / Average Accounts Receivable | The higher the turnover, the faster the business is collecting its receivables and the more cash the client generally has on hand. |
| Growth Force | Sales Growth Ratio ($X_8$) | (Net Sales for Current Period - Net Sales for Prior Period)/ Net Sales for Prior Period | Generally, the higher the sales growth, the better. It should be combining with other financial ratio whether the sales are over expanded or not. |
| Productivity | Sales Per Employee ($X_9$) | Sales / Employee Numbers | A higher sales-per-employee ratio indicates that the company can operate on low overhead costs, and therefore do more with fewer employees. |

Source: compiled by this study

### 2.2 Standardized Unexpected Earnings (SUE)

Ball & Brown (1968) indicated that stock returns continue to drift in the direction of earnings surprises for several months after the earnings are announced. Since then, empirical characteristics of dynamic trading strategies showed that such stocks on their standardized unexpected earnings (SUE)[1] yield significantly positive payoffs in the year following the earnings announcement (Foster *et al*., 1984; Bernard & Thomas, 1990; Hew *et al*., 1996; Booth et al., 1996). SUE is a measure of unexpected earnings, and reaction to the earnings announcement. Accordingly, we consider that company's quarterly earnings surprise is measured by SUE in this paper. More specifically, SUE for stock *i* in month *t* defined as:

$$SUE_{it} = \frac{e_{iq} - e_{iq-4}}{\sigma_{it}} \quad (1)$$

Where $e_{iq}$ is the most recent quarterly earnings announced as of month *t* for stock *i* (not including announcements in month *t*), $e_{iq-4}$ is earnings four quarters ago and $\sigma_{it}$ is the standard deviation of ($e_{iq} - e_{iq-4}$) over the preceding eight quarters. This measure has been used by Chan *et al*. (1996), except that they do not include a drift term. The absolute value of SUE measures the degree of unexpected earnings and the sign of SUE indicates whether the unexpected earnings are above or below the consensus estimate. That is, the greater the positive SUE, the greater the earnings

[1] The SUE is defined as the difference between companies' actual earnings and the analysts' consenses earnings estimate divided by the standard deviation of the analysts' earnings estimates (Hsu, 2001).

surprise above the earnings estimate, while the smaller the negative SUE, the greater the earnings surprise below the earnings estimate. There's no earnings surprise when SUE equals zero; the actual earnings per share is in line with the consensus earnings estimate (Hsu, 2001).

### 2.3 Random and Fixed Effects Models

2.3.1 Random effect model estimation

$$Y_{it} = \alpha_i + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} = \bar{\alpha} + \mu_i + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \quad i=1,...,n;\ t=1,...,T \qquad (2)$$

Where $\alpha_i$ represents unobserved heterogeneity that is stable (or fixed) over time. In the random effect model, we now additionally assume that the unobserved effect $\alpha_i$ is uncorrelated with each explanatory variable.

2.3.2 Fixed effect model estimation

Fixed effect estimation is a method of estimating parameters from a panel data set. Fixed effect models consider only within-study variability.

$$Y_{it} = \alpha_1 \times D_1 + \alpha_2 D_2 + ... + \alpha_n \times D_n + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} = \sum_{j=1}^{N} \alpha_j D_j + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \qquad (3)$$

$$i=1,...,n,\ t=1,...,Ti$$

Where *Dj* is a dummy variable which takes the value one for individual *j* and zero otherwise. See Greene (1995; 2003) for a more detailed discussion.

### 2.4 Choosing Random and Fixed Effects Models

To run a Hausman test comparing fixed and random effects in data, we need to first estimate the fixed effect model, save the coefficients so that we can compare them with the results of the next model, estimate the random effect model, and then do the comparison.

$$\begin{cases} H_0 : \alpha_1 = \alpha_2 = ..... = \alpha_i \\ H_1 : \alpha_i,\ i = 1,.....,S \end{cases}$$

The Hausman test analyses the $H_0$ that the coefficients estimated by the efficient random effect estimator are the same as the ones estimated by the consistent fixed effect estimator. If they are insignificant *P*-value, then it is safe to use random effect. If we get a significant *P*-value, however, we should use fixed effect. So the way to test this is by running both models and then comparing their sum of squares in a joint F-test.

$$F_{(n-1,\ nT-n-k)} = \frac{(R^2_{fix} - R^2_{ols})/(n-1)}{(1 - R^2_{fix})/(nT - n - k)} \qquad (4)$$

Where $R^2_{fix}$ is the fixed effect model of *R* square; $R^2_{ols}$ is a ordinary least square model of *R* square; The *n* indicates the piece of cross section data; The *T* indicates the number of time series; The *k* indicates the piece of regression variables; The $(n - 1, nT - n - k)$ indicates the freedom degree of F-test.

## 3. EMPIRICAL RESULTS

The LM-test is particularly useful because it is not only suitable for testing for autocorrelation of any order, but also suitable for models with or without lagged dependent variables. After applying the LM-test to the residual series to check the autocorrelation ($H_0$: No serial correlation which means applying ordinary least squares(OLS) model), we find the *p*-value less than 0.0001 is lower enough than 5% significance levels, which means we can reject the null hypothesis that the residual series hasn't autocorrelation. It means that the random effect model provides a better fit OLS model.

In order to robust the Choosing fixed effects model of F-test. In Table 2, the results show the *p*-value near 0, and the F-test value is 5.941 greater than critical value 1.642 at the 1% level .The results couldn't accept the null hypothesis, also the F-test value is statistically significant. It means that the fixed effect model provides a better fit than OLS model. According to Baltagi (1995) & Greene (1995) Hausman's $X^2$ statistic for testing random versus fixed effects is applied. In Table 2, the results show the *p*-value near 0 and the Hausman test value 52.63 is greater than chi-square critical value 26.23 at the 1% level. The Hausman test value is statistically significant and it means that the result can be explained by fixed effect model.

In order to realize the SUE and its interaction variable (whether exists under fixed effect model by the Chow test) (Chow, 1960).

1. The regression model includes SUE and its interaction variable:

$$Y_{it} = \alpha_i + \delta SUE_{it} + \eta SUE_{it} * X_{it} \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{itt} \qquad (5)$$

2. The regression model does not include SUE and its interaction variable:

$$Y_{it} = \alpha_i + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{in} \quad (6)$$

Where $i$ is the number of companies($i = 1,2,....,n$); $t$ is the time($t = 1,2,....,T$); $k$ is the number of explain variables ($k = 1,2,....,K$); $\beta_k$ is correlation coefficient. Hypothesis test is as follows:

$$\begin{cases} H_0 : \delta=0, \eta=0 \\ H_1 : \delta\neq0, \eta\neq0, \text{ or } \delta,\eta\neq0 \end{cases}$$

The Chow test is an econometric test of whether the coefficients in two regressions on different data are equal.

$$F_{(J,T-K)} = \frac{(SSE_R - SSE_U)/J}{SSE_U/(T-K)} \quad (7)$$

In order to understand whether the per share pre-tax income and SUE are the most important factors of the firm performance or not, this paper explores a new interaction variable which is the product of per share pre-tax income and SUE, as it captures the interaction effect of profit and information disclosure on net income of the firms.

Where $SSE_R$ is within the variation does not include $SUE_{it}$ and $SUE_{it} * X_{4t}$ ; $SSE_U$ is the within of variation include $SUE_{it}$ and $SUE_{it} * X_{4t}$ above. The test statistic follows the F distribution with $J$ and $T - K$ degrees of freedom. The result of the Chow test value 68.89 is greater than critical value 4.79 at the 1% level, which is to refuse null hypothesis. It indicates that we have to include SUE and its interaction variables in fixed effect regression.

The coefficient in Table 2 shows that the five forces of financial indices, SUE and its interaction variable are significantly correlated to the net income ratio. The positive significance sign of SUE indicates that the higher SUE is the greater net income ratio in companies. If companies' SUE is positive, it means to have good news, and then the net income ratio will also increase. However, the interaction variable is negatively related and significant.

As result of the manufacturing's, leverage are large, needs capital stocks to afford to pay and maintain appropriate leverage. While capital stock expand, it will cause the reduction of per share pre-tax income. SUE is a measure of unexpected earnings, and reaction to the earnings announcement. We combine per share pre-tax income and SUE as the new integrated indicator. While the value of indicator gets higher, it will cause higher deviation of EPS. (Erol, 2005).

The Manufacturing Institute of America points out that the manufacturing industry faces its shortage between high technical workers' supply and demand. In order to improve this problem, firms replace their facilities frequently to reduce the salary payment, and lack of high technical labor supply seems more serious. Therefore, high ratio of short-run sales per employee does not favor operating achievements in the long run if China's capital-density industrial system couldn't employ enough high technical workers.

The acid-test ratio measures the ability to pay current liabilities from the most liquid current assets. The manufacturing industry should involve more investment in the plants to increases the effectiveness of equipments and staff, and to promote entire operating performance. In the other words, high acid-test ratio means lack of capital efficiency.

The ratio of net sales to average total asset reflects a company's efficiency at using its assets in generating sales or revenue. A high value of this ratio would mean that the firm owns a few fixed assets.

Generally, the higher the sales, the better is the growth. It should be combining with other financial ratios (whether the sales are over expanded or not). If the value has expanded in the short time, it reveals the enterprises' lack of long-run purchase order.

The findings show evidence of SUE and its interaction variable are statistically significant (more than the stability and growth force of financial indices). Obviously, the EN discloses the companys' final net income situation.

**Table 2 Each Variable and Test**

| Structure | Variables | Fixed Effect | Radom Effect |
|---|---|---|---|
| Earning News | SUE | 4.2573 (<0.0001)***a | 3.9302 (<0.0001)*** |
| Interaction variable | SUE * Per Share Pre-tax Income | -12.5751 (<0.0001)*** | -12.3046 (<0.0001)*** |
| Stability | Liabilities Ratio ($X_1$) | -0.3730 (0.0017)*** | -0.3565 (0.0003)*** |
| | Acid-test Ratio ($X_2$) | -0.0305 (0.0002)*** | -0.1108 (0.1283) |
| Profitability | Operating Expense Ratio ($X_3$) | -0.0682 (0.0873)* | -0.5470 (0.1475) |
| | Per Share Pre-tax Income ($X_4$) | 34.7069 (<0.0001)*** | 35.5711 (<0.0001)*** |
| Operating Performance | Total Asset Turnover Ratio ($X_5$) | -27.7619 (0.0054)*** | -23.6592 (0.0008)*** |
| | Equity Turnover Ratio ($X_6$) | 14.2687 (0.0048)*** | 7.1489 (0.0450)** |

| | | | |
|---|---|---|---|
| | Accounts Receivable Turnover Ratio ($X_7$) | 0.0547 (0.0270)*** | 0.4128 (0.0197)** |
| Growth Force | Sales Growth Ratio ($X_8$) | -0.0544 (0.0447)** | -0.1490 (0.5474) |
| Productivity | Sales Per Employee ($X_9$) | -0.0014 (0.0008)*** | -0.6634 (0.0616)* |
| | Intercept ($\alpha_i$ ) | N/A[c] | 25.4473 (<0.0001)*** |
| | Lagrange Multiplier Test | 35.32 (<0.0001)*** | |
| | F-test | 5.941 (<0.0001)*** | |
| | Hausman Test | 52.63 (<0.0001)***b | |
| | Chow Test | 68.89 (<0.0001)*** | |
| | $R^2$ | 0.8326 | |
| | $R^2_{adj}$ | 0.7787 | |

Notes: (a) The numbers in parenthesis represent p-value.

(b) ***, ** and * represent significance at the 1%, 5 % and 10% levels, respectively.

(c) In fixed effect model assumption, intercept is stable over time.

## 4. CONCLUSION

We applied panel data regression with fixed effect to analyze operating performance of China's listed companies by standardized unexpected earnings. Then we found that unexpected earnings news would play an important role on the accurate prediction of companies' value in the future. Earnings disclosure could be significant factors while detecting earning ability of China's companies. The implication and recommendations of this article are as follows:

It is found that unexpected earnings contain significant information; which is the most important factor in explaining announcement effect of the annual earnings disclosure. For the reason, we can observe that either listed companies take financial distress or delay the disclosure of bad news on earnings. The earnings news could be important indicators for investors while making their decision, and investors will closely get to understand the target companies' operating performance.

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