

The Effect of Manager's Earnings Forecast Error on Actual Earnings and Share Price :A Case Study of Listed Companies

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Abstract—The corporate net income is made based on accrual basis. However, the flexibility within accounting recognition gives managers certain control upon accruals, and thereby proceed earnings management to affect corporate net income. Such manipulation caused many financial frauds of companies recently.

According to research samples of 2000-2009, this research finds discretionary accruals were predictable for managers to influence future earnings. In addition, given further classification into discretionary current and non-current accruals, namely discretionary current accruals showed abundant information content on earnings management. Therefore, the research believes discretionary accounts receivable, accounts receivable, inventory and depreciation were the most relevant components frequently used for earnings management and information transmission. Among the four components, the inventory possessed notable influence to future corporate net income because most investors have differences in the degree of expertise of the financial statement and the inventory is likely to make most investors understand the abundant information. Meanwhile, the inventory-provided good prediction for future stock returns.

Keywords— Accrual Basis, Accrual Quality, Net Income, Returns, DCA, DA

I. INTRODUCTION

THERE are many financial frauds among companies recently, such as PROCOMP, INFODIS and SUMMIT. By reviewing the company with financial fraud and crisis historically, they all beautify earnings on financial statements and operating performance through earnings management. However, the net income namely the profit index not only receives the major investor's attention, but also fully expresses enterprise performance. The enterprise net income is made based on accrual basis. However, the flexibility per generally accepted accounting principles (GAAP) gives managers certain

control upon accruals, and thereby proceed earnings management to affect corporate net income. [1] indicated accrual is characterized by two traits. First, accrual reflects the influence of many accounting policy on earnings; therefore the change of single account method can even affect business performance. Second, accrual is the combination of many accounting methods; it accordingly covers many unrecognizable choices among account methods. Taking the choice of depreciation method and the financial investment category for example, they all explain why accrual is the preferred tool for managers' earnings management. Moreover, accruals are also found to proceed earning management and affect corporate net income through diverse research topics such as company with financial crisis [2], company with initial public offering (IPO) [3] and company before seasoned equity offerings (SEO) [4].

From the standpoint of cash flow statement, accrual and operating cash flow are the two main components to form statement net income. Financial statement is made by accrual basis, the net income and operating cash flow under accrual basis are comparatively available in actual use without time influence. Furthermore, cash flow is restricted in its manipulation difficulty, therefore net income is the most frequent index used for investors to evaluate business profit.

Among the decision on financial statements, the accrual of net income is managers' preferred tool for earnings management. Therefore, this research is motivated by the above-mentioned reasons to study the two main issues: "Whether managers affect stock price by manipulating earnings management?" and "Can managers affect stock price by manipulating earnings management?"

Because the acknowledged accounting principles allows the same economic item to be equipped with different accounting methods, manage can thus has his options per different situation. According to scholars' literatures, the purposes of revised financial statement might be generalized: (1)Income smoothing [5]. (2)Modify manager's salary by the change of accounting principles. (3)Decrease political cost [6]. (4)Avoid the limit of debt contract [7]. These theories are admittedly reasonable, however, still incapable to predict concrete accrual adjustment, namely "Which adjustment lead which results." Accordingly, people still cannot fully understand the influence of accounting adjustment and its implication so far. Regarding the empirical accounting

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research, Ball and [8] as well as [9] tried to explain the accounting policy of enterprise via better accounting theory. To explore manager's reasons of opportunistic accounting principle, [10] adopted the inventory and depreciation method as accounting choices. Before a operating- failure company taken over, they found it is more likely to choose the accounting principle which increase earnings than normal companies, this indicates the existent accounting opportunism. In other words, accounting choice shows significant influence on net income. Compared to normal companies, [11] also found companies with operating crisis exist more accounting principle changes, and thereby increase earning number.

This research explores whether managers affect net income and even stock price through earnings manipulation. The research goal can be divided into three parts below:

A. DCA

With the biggest control, discretionary current accrual (DCA) is the business-related component for manager's frequent use. Based on the flexibility under accounting method, manager can apply certain influences on earnings through discretionary accrual (DA), discretionary current accrual (DCA) or the business-related DCA. Among these components, DCA shows the biggest influence.

B. DA

The correlation between DA and earnings management is discussed. When DA changes, company earnings is consequently affected for certain degree, it can be predicted that positive correlation exists between the change of account receivable and earnings, while negative correlation exists between the change of inventory and earnings.

C. The predictability of discretionary accrual on stock returns.

After earnings manipulation, manager changes company profitability and further affects investor's evaluation on stock price.

II. LITERATURE REVIEW

This research manipulates accrual to study future earnings and abnormal returns. Total accrual (TA) possesses two advantages: 1. In comparison with single accounting method, it reflects all influence of accounting policy on earnings. 2. With the combination of multiple accounting methods, it covers several unrecognizable accounting methods.

TA is divided into DA and non-discretionary accrual (NDA). The former refers to the part with manager's strong control (e.g earlier recognition of sales and delayed recognition of expenses). The later is the part with manager's less control (e.g

the change of depreciation method). In other words, NDA means the accounting method is decided and manager owns less control on the following changes.

This research believes enterprise should proceed earnings management on the DA within accruals, thereby establish the hypothesis one: manager mainly adopts DA to affect net income by earnings management, hence DA shows more abundant information.

Teoh [12] found DCA within DA can be used to detect the behavior of earnings management in IPO or SEO. Their research results show the cost effectiveness produced from current accrual and non-current accrual are different. Manager prefers DCA with bigger liquidity. In the research results of [13], DCA is also often used by manager because of its bigger liquidity. Per time period and manager's decision, the research consequently further categorizes DA into DCA and discretionary long-term accrual (DLA). The former shows stronger relation with current asset and main operation in enterprise. Besides, it provides manager more control than the later. As a result, the research believes DCA is one of the main considerations when manager proceeds DA in their procedure. Manager will proceed earnings management to affect net income through the control of DCA. Therefore, the hypothesis two is formed: manager mainly adopts DCA within DA to proceed earnings management and affect net income, which makes DCA more abundant information content.

Because both DA and DCA are total concept, this research thinks enterprise should adopt the frequently-used and business-related item for manipulation. When enterprise proceeds earnings management, [2] thought business-related accruals include inventory, account receivable and account payable. In the opinion of [14], the items are account receivable, account payable, advance receipts, prepayment and inventory. After the literature review, the research believes manager will adopt business-related accruals such as discretionary account receivable, account payable, prepayment, advance receipts, inventory and depreciation for earnings management. The hypothesis three is formed: manager principally adopts the business-related DA to proceed earnings management and affect net income, which makes DA more abundant information content.

Zhao [15] explored the correlation between accrual/accrual component (receivables, inventory and account payable variable) and stock returns. He found positive relationship exists among current accrual/accounts receivable, inventory /account payable variable and stock returns of previous three years. Meanwhile, negative relationship exists among the three items and stock returns of following three years. After utilizing the revised model from [16] and [17], the research estimates DA and its components(accounts receivable, inventory and account payable variable). The results indicate the negative relationship exists among DA/ discretionary account receivable, inventory/account payable variable and future stock return. Such condition is similar to the empirical results of [15] but not further notable. This means

under the economic control, the negative relationship between the decided accruals and future stock return are not even more notable. Thus the hypothesis four is formed: manager mainly adopts DA to affect stock returns.

III. METHODOLOGY

Because accrual reflects all the influence of accounting policy on earnings, the research adopts accrual for enterprise earnings management. In addition to the combination of several accounting methods, accrual can be divided into DA, DCA and business-related DA per manager's control degree. In the research, the data of DA and business-related DA was estimated per the Modified Jones Model of [18]. Meanwhile, DCA was estimated per the formula of [12].

A. The discretionary accrual (DA) and non-discretionary accrual (NDA)

The research utilized the transverse Modified Jones Model found by [18] to estimate the NDA of research samples. This regression formula regards all accounts receivable and the change of bank note as DA. [18] acclaimed that manager can manipulate income based on the recognition timing of account receivable.

The accrual formula of the i company(sample), refer equation (1):

$$\left(\frac{TA_{i,t}}{A_{i,t}}\right) = \alpha_1 \left(\frac{1}{A_{i,t}}\right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t}}\right) + \varepsilon_{i,t} \quad (1)$$

$\Delta REV_{i,t}$ = The net operating revenue difference of the i company in the t year, namely the net operating revenue variable between the t and t-1 year.

$\Delta REC_{i,t}$ = The account receivable and bank note variable of the i company in the t year, namely the their difference between the t and t-1 year.

$PPE_{i,t}$ = The fixed asset total of the i company in the t year.

Parameter α_1 , α_2 and α_3 are found and applied into parameter β_1 , β_2 and β_3 in the following formula, in order to estimate the NDA of the i company in the t year. Please refer equation (2):

$$NDA_{i,t} = \beta_1 \left(\frac{1}{A_{i,t}}\right) + \beta_2 \left(\frac{\Delta REV_{i,t}}{A_{i,t}}\right) + \beta_3 \left(\frac{PPE_{i,t}}{A_{i,t}}\right) \quad (2)$$

After calculating NDA, the difference of TA and NDA is DA.

$$DA_{i,t} = TA_{i,t} - NDA_{i,t}$$

Model building:

$$NI_{i,t+1} = a_1 + b_1 DA_{i,t} + c_1 NDA_{i,t}$$

B. The discretionary current accrual (DCA) and discretionary long-term accrual (DLA)

[12] further extended the Jones Model to calculate DCA. The calculation method is shown as below:

The calculation method of CA is shown as below:

CA = Δ (current assets - cash) - Δ (current liabilities - long-term liabilities within one-year due)

Short-term accrual of the i company is estimated as equation (3) as below:

$$\frac{CA_{i,t}}{A_{i,t}} = \alpha_1 \left(\frac{1}{A_{i,t}}\right) + \alpha_2 \left(\frac{\Delta REV_{i,t}}{A_{i,t}}\right) + \varepsilon_{i,t} \quad (3)$$

Parameter α_1 and α_2 are found, then applied into the parameter β_1 and β_2 in the following formula, in order to estimate the DLA. Please refer equation (4)

$$\left(\frac{NDAC_{i,t}}{A_{i,t}}\right) = \beta_1 \left(\frac{1}{A_{i,t}}\right) + \beta_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t}}\right) \quad (4)$$

DCA equals the difference of current accrual(CA) and non-discretionary current accrual(NDCA).

$$DCA_{i,t} = CA_{i,t} - NDCA_{i,t}$$

The difference of DA and DCA is DLA.

$$DLA_{i,t} = DA_{i,t} - DCA_{i,t}$$

$DCA_{i,t}$ = the DCA of the i company in the t year.

$DLA_{i,t}$ = the DLA of the i company in the t year.

$NDCA_{i,t}$ = the NDCA of the i company in the t year.

Model building:

$$NI_{i,t+1,t} = a_1 + b_1 DCA_{i,t} + c_1 DLA_{i,t}$$

C. The Business-related DA

The calculation is quite similar to the model above, but the difference is only to replace individual DA (Because depreciation as income statement items means the expense of annual business, all subjects are variable except depreciation. As for the other items are cumulative results on balance sheet, the research take its variable); TA as dependent variable, in order to estimate individual DA. Taking account payable formula in the revised Jones model as example, the formula of business -related DA is shown in below as equation (5):

$$\left(\frac{\Delta AP_{i,t}}{A_{i,t}}\right) = \alpha_1 \left(\frac{1}{A_{i,t}}\right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t}}\right) + \varepsilon_{i,t} \quad (5)$$

$\Delta AP_{i,t}$ = the account payable variable of the i company in the t year, namely the account payable difference between the t and t-1 year. After parameter α_1 , α_2 and α_3 are found, then applied into the parameter β_1 , β_2 and β_3 in the following formula, in order to estimate the discretionary account payable of the i company in the t year. Please refer equation (6).

$$\left(\frac{DAAP_{i,t}}{A_{i,t}}\right) = \frac{\Delta AP_{i,t}}{A_{i,t}} - \left[\beta_1 \left(\frac{1}{A_{i,t}}\right) + \beta_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t}}\right) + \beta_3 \left(\frac{PPE_{i,t}}{A_{i,t}}\right) + \varepsilon_{i,t} \right] \quad (6)$$

$DAAP_{i,t}$ = the discretionary account payable of the i company in the t year.

$DAAR_{i,t}$ = the discretionary account receivable of the i company in the t year.

$DAPP_{i,t}$ = the discretionary prepayment of the i company in the t year.

$DAPRE_{i,t}$ = the discretionary advance receipt of the i company in the t year.

$DAINV_{i,t}$ = the discretionary inventory of the i company in the t year.

$DADEP_{i,t}$ = the discretionary depreciation of the i company in the t year.

Meanwhile, the calculation method of individual DA like discretionary account receivable, inventory, advance receipts, prepayment and depreciation...etc is similar to above.

Model building as equation (7):

$$NI_{i,t+1} = a_1 + b_1 DAAP_{i,t} + c_1 DAAR_{i,t} + d_1 DAPP_{i,t} + e_1 DAPRE_{i,t} + f_1 DAINV_{i,t} + g_1 DADEP_{i,t} \quad (7)$$

The research will adopt operating cash flow within cash flow statement which became effective since 1990 per SFAS No.17, As a result, the research will select listed companies of 2000-2009 as samples; In addition to the coverage of business cycle in sample span; meanwhile, exclude financial industry, insurance industry and full-delivery stocks.

IV. EMPIRICAL RESULTS

A. Utilize DA to proceed earnings management and affect net income

From regression model in Table 4-2, R^2 is adjusted to 28.5%, namely its explanation upon earnings is 28.5%. Although NDA (coefficient 2.01) is bigger than DA (coefficient 0.245), the P value of NDA doesn't reach significance. While the P value of DA reaches 1% significance, it means DA shows significant influence on the next earnings. Such founding is as the same as [19], namely manager can utilize DA to proceed earnings management and affect net income. [20] also thought manager's DA recognition decision can be regarded as tool for message release. This research found NDA is not predictable for manager to affect future earnings. Consequently, the statements above match the hypothesis one: Both DA and NDA possess information content. However, manager mainly adopts DA to proceed earnings management and affect net income. This leads DA shows abundant information content.

Regression model is as equation (8):

$$NI_{i,t+1} = a_1 + b_1 DA_{i,t} + c_1 NDA_{i,t} \quad (8)$$

$NI_{i,t+1}$ is the net income in the phase t+1, DA is discretionary accrual and NDA is non-discretionary accrual.

Remark: * significant level 10% , ** significant level 5% , *** significant level 1%

B. Utilize DCA to proceed earnings management and affect net income

To judge whether DCA acts the tool for manager's earnings management and information transmission, [12] classified DCA and DLA. From regression model in Table 4-3, R^2 is adjusted to 7.4%. Its explanation sharply declines, but it is still in the acceptable range since many factors affect earnings in financial model. Although DLA (coefficient 0.201) is bigger than DCA (coefficient 0.168); the P value of the same DLA doesn't reach significance. While the P value of DCA reaches 1% significance, which means DCA shows notable influence on the future earnings. Meanwhile, it also confirms DCA is the main tool for manager's information transmission, namely it's probably not one of the main consideration tools. These findings not only match the research of [13], but also the hypothesis two:

Table 1 DA Analysis Result

Independent variable	coefficient	T value	P value
intercept	0.058	13.12	0.000***
DA	0.245	19.51	0.000***
NDA	2.01	0.676	0.27
Adj R^2		0.285	

Manager principally adopts DCA to proceed earnings management would affect net income; therefore DCA shows more abundant information content.

Regression model is as equation (9):

$$NI_{i,t+1,t} = a_1 + b_1 DCA_{i,t} + c_1 DLA_{i,t} \quad (9)$$

$NI_{i,t+1}$ is the t+1 net income,

DCA is discretionary current accrual,

DLA is discretionary long-term accrual

Table 2 DCA Analysis

Independen t variable	coefficient t	T value	P value
intercept	0.053	21.57	0.000***
DCA	0.168	16.37	0.000***
DLA	0.201	1.264	0.14
Adj R^2		0.074	

Remark: * significant level 10% , ** significant level 5% , *** significant level 1%

C. Proceed earnings management to affect net income by business-related DA

The research believes the DA is the most business-related component frequently used for earnings management and information transmission. With the notable influence on future earnings, the research thinks manager mainly adopts discretionary account receivable, account payable, inventory and depreciation to proceed earnings management.

From regression model in Table 4-4, R^2 is adjusted to 5.1%. The P value of discretionary prepayment and accounts receivable doesn't reach significance while the P value of discretionary account payable, account receivable, inventory and depreciation all reach 1% significance. The data mean the future earnings declines 0.125 unit when discretionary account payable rises 1 unit; The future earnings notably rises 0.241 unit when the discretionary account receivable rises 1 unit; The future earnings notably rises 0.057 unit when the discretionary inventory rises 1 unit; The future earnings notably decline 0.425 unit when the discretionary depreciation rises 1 unit. These results correspond to the hypothesis three: managers principally proceed earnings management to affect net income by adopting the business-related DA. Consequently, the business-related DA shows more abundant information content.

Regression model is as equation (10 and 11)

$$NI_{i,t+1} = a_1 + b_1 DAAP_{i,t} + c_1 DAAR_{i,t} + d_1 DAPP_{i,t} + e_1 DAPRE_{i,t} + f_1 DAINV_{i,t} + g_1 DADEP_{i,t}$$

(10&11)	DAINV	-0.025	-3.58	0.000***
	DADEP	-0.425	-0.87	0.0.26
	Adj R^2		0.021	

$NI_{i,t+1}$ is the t+1 net income, $DAAP$ is discretionary account payable, $DAAR$ is discretionary account receivable, $DAPP$ is discretionary prepayment, $DAPRE$ is discretionary advance receipt, $DAINV$ is discretionary inventory, $DADEP$ is discretionary depreciation.
 Remark: * significant level 10% , ** significant level 5% , *** significant level 1%

D. The correlation of DA and stock returns

Table 3 The Analysis of Business-Related DA

From regression model in Table 3, R^2 is adjusted to 2.1%. Such explanatory variable shows 2.1% explanation on abnormal stock returns. In the analyses above, the business-related accruals like discretionary account receivable, account payable, inventory and depreciation show notable negative influence on future earning. This indicates abnormal returns declines 0.025% when discretionary inventory rises 1 unit. Meanwhile, only discretionary inventory shows notable influence on the explanation of abnormal stock returns. The main reason comes from managers and most investors have different expertise level of the financial statement, and only the inventory is likely to make most investors understand. Therefore, the change of inventory shows notable influence on abnormal stock returns in the future.

When the research explores the abnormal returns of future stock among discretionary account payable, account receivable, inventory and depreciation, it found these four variables all show negative relationship with future stock return, meanwhile, the inventory shows notable influence.

Regression model is

$$AR_{i,t+1} = a_1 + b_1 DAAP_{i,t} + c_1 DAAR_{i,t} + d_1 DAPP_{i,t} + e_1 DAPRE_{i,t} + f_1 DAINV_{i,t} + g_1 DADEP_{i,t}$$

$AR_{i,t+1}$ is the t+1 abnormal stock return, $DAAP$ is discretionary account payable, $DAAR$ is discretionary account receivable, $DAINV$ is discretionary inventory, $DADEP$ is discretionary depreciation.

Table 5 The Result of Analysis

Independent variable	coefficient	T value	P value
intercept	0.026	10.51	0.000***
DAAP	-0.125	-0.68	0.481
DAAR	-0.241	-1.28	0.124

Remark: * significant level 10% , ** significant level 5% , *** significant level 1%

V. CONCLUSIONS AND SUGGESTIONS

A. Conclusion

Earnings management is also called income manipulation. In theory, financial statement should reflect real operation performance, high reliability and comparability. However, the

Independent variable	coefficient	T value	P value
intercept	0.026	10.51	0.000***
DAAP	-0.125	-8.78	0.000***
DAAR	0.241	12.34	0.000***
DAPP	-0.145	-1.26	0.125
DAPRE	-0.043	-0.48	0.592
DAINV	0.057	3.58	0.000***
DADEP	-0.425	-7.87	0.000***
Adj R^2		0.051	

issue "How to present realness of financial statements" is a test for managers' wisdom. The primary cause of earnings management is managers do not authentically present earnings performance but consider social expectations or operation concerns. The motives of earnings manipulation generally include: 1. Hold the first-hand earnings information to manipulate stock price and obtain excess capital gains. Because business performance is highly related with stock price, the earnings management is often used to manipulate stock price and raise funds. 2. Meet the external finance demands: match the listing rules, perform SEO, raise funds overseas and compete for better leverage condition. Earnings level, fundamental plane and stock price are crucial for enterprise to successfully raise funds in capital market. Earnings information acts two important requirements during the initial public offer (IPO): (1) To be qualified and make IPO, securities issuer must exceed the profit threshold of listing application. (2) During the stock listing, accounting earnings shares quite large proportion in the

formula of IPO price. Based on company benefit and original shareholder's wealth, securities issuer always manipulate earnings management to increase the of IPO price. 3. To obtain higher bonus or protect job, manager will create short-term operating performance. For instance, they tend to increase accounting policy of short-term earnings, even sacrifice long-term value to achieve short-term performance. 4. In addition to the purpose of tax saving and tax avoidance, profit distortion is also used to avoid excessive tax payment and taxation. Because many vague parts exist in billing field, enterprise can thus performs the flexibility and exclusive information for earnings management without revelation.

The empirical results found DA are predictable for the future earnings of Taiwan's listed companies. Manager utilizes his control upon DA to affect enterprise future earnings, which matches not only the hypothesis one but also the opinion from [21]. The empirical results found DA are predictable for the future earnings of Taiwan's listed companies. Manager utilizes his control upon DA to affect enterprise future earnings, which matches not only the hypothesis one but also the opinion from [21]. If DA is further divided into DCA and DLA, the findings correspond to [12], [13] and the hypothesis two. Because the research utilizes DCA to proceed earning management and affect net income, DCA shows more abundant information content.

The research believes discretionary accounts receivable, accounts receivable, inventory and depreciation are the most relevant components frequently used for earnings management and information transmission. Among the four components, the inventory possesses abundant information content and notable influence to future net income, which matches the hypothesis three. Meanwhile, the inventory provides good prediction for future stock returns, which matches the hypothesis four.

B. Suggestions

Intercept still shows significance in each regression model, which indicates its explanatory variable of significance. For this reason, the following researches can add dummy variable into model for further exploration, such as the different influence between value stock and growth stock or different business cycle.

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