

**DO FIRMS MANIPULATE EARNINGS TO CORRECT MARKET MISPRICING? REAL OPERATION VERSUS  
ACCRUAL MANAGEMENT**

**Chau Duong<sup>1</sup>**

**ABSTRACT**

Jensen's (2005) agency theory predicts that overpriced firms would manage earnings upward opportunistically in attempts to maintain the overvaluation. On the other hand, the signaling hypothesis is also one of the most cited incentives why managers manage earnings, which predicts that managers would use earnings management as a signaling tool to correct the market. This research argues that Jensen's hypothesis only holds in short-term while in long-term managers may wish to escape from the game of maintaining market overvaluation. Therefore, I predict that in long-term, overpriced firms may manage earnings downward. I provide some preliminary empirical evidence in supports of the long-term signaling hypothesis in the context of UK overpriced firms during the 1995-2004 period. This research also seeks to design trading strategies that could exploit the observed manager's earnings management behaviours.

**MAY 2010**

---

<sup>1</sup> Faculty of Business and Management, Canterbury Christ Church University.  
Email: c.m.duong41@canterbury.ac.uk

# I. INTRODUCTION

This paper investigates how over-valued firms manage earnings using accruals management and real operation management. Jensen's (2005) theory predicts that over-valued firms would exercise income-increasing earnings management in attempts to maintain the overvaluation. Although there are some strong evidence that is in support of this theory (e.g. Houmes and Skantz, 2010), the evidence needs to be supplemented in at least the following main aspects. First, most of the extant evidence only concentrates on accruals management while the question how real operation management is employed by over-priced firms are still not yet extensively investigated. Supplementing this piece of evidence will significantly enhance our knowledge on the matter because it seems obvious that accruals management is not the only option for managers to manipulate earnings. Second, while Jensen's (2005) argument is reasonable in that managers seem to be trapped in the game of maintaining the overvaluation, it is not completely irrational to expect that managers do wish to escape from the game in long-term. Being overvalued induces some costs to the firms as well as some troubles to the managers personally. Therefore, in long-term, it would be expected that managers may wish the mispricing to be eliminated. This paper aims at investigating whether managers of overvalued firms manipulate earnings to correct the market mispricing and whether investors can make profits by exploiting the (possibly predictable) manager's earnings management behaviours. In particular, the research will seek to answer the following questions:

- Whether, in short and long-term, UK overpriced firms manage earnings to maintain market overvaluation or to correct market mispricing;
- If they do manage earnings, how do managers choose between accruals and real operation management;
- Whether a trading strategy that takes into account such earnings management behaviour can be profitable.

Given the growing interest in capital market incentives to manage earnings and the recent increased regulatory controls of accruals management, the answers to the above research questions should be of great interest to the investment community. In particular, the insights gained from this research will be especially useful to investors whose trading activity targets mispriced stocks. Furthermore, evidence about profitable trading opportunities that can be created through a more informed use of earning figures is expected to draw considerable attention from the investment community.

This research will enhance our knowledge on how firms manage earnings interactively with market mispricing and interchangeably between real operation and accrual management. Moreover, I also expect that the research will lead to profitable trading strategies that could be implemented in practice. Such knowledge is original and very interesting for at least three reasons. First, in lights of the cumulative evidence in support of Jensen's (2005) prediction that overpriced stocks would manage earnings upwards (i.e. in line with the opportunistic hypothesis), my test of the signalling hypothesis could be of great interest to academics thanks to its potential to advance our knowledge on the issue. Second, given the growing interest in capital market incentives to manage earnings and the recent increased regulatory controls of accruals management, evidence on manager's choice between accruals and real operation management are very interesting to the investment community. In particular, the insights gained from this research will be especially useful to investors whose trading activity targets mispriced stocks. Third, evidence about profitable trading opportunities that can be created through a more informed use of earning figures is expected to draw considerable attention from the investment community.

The rest of this proposal proceeds as follows. Section II briefly reviews some literature that are most related to this research. Section III develops some testable hypotheses which are related to the first and second research questions as presented earlier. Section IV describes the main methodologies and data employed. Section V provides some preliminary evidence regarding the tests of the hypotheses as

developed in section III<sup>2</sup>. Finally, section VI will provide a possible direction to address the third research question.

## **II. LITERATURE REVIEW**

The earnings management literature is one of the largest and most interesting areas of research in accounting. While there is consensus in the literature that managers do manage earnings, this strand of research still attracts considerable attention in relation to the strategies and motives for managing earnings. Two main earnings management strategies are recognised in the literature. First, managers can exercise their discretion over the choice of accounting policy. For example, Neill et al. (1995) find evidence of managers exercising the discretion over choices of LIFO or FIFO method in inventory accounting and choice of depreciation methods to maximize proceedings in IPOs; or Bowen et al. (2002) find that internet firms may manage earnings through revenue recognition. Early studies often attempt to estimate abnormal accruals, which is the level of accruals within the discretion of managers, to proxy for earnings management. Jones (1991) presents one of the most popular models to estimate abnormal accruals. Dechow et al. (1995) show that a modified version of Jones' model could reduce estimating errors. However, due to problems associated with survivorship bias, which is implicit in the time-series estimation of abnormal accrual models, DeFond and Jiambavo (1994) advocate a cross-sectional approach to estimating abnormal accruals. The cross-sectional version of the modified Jones model is found to be among the best specified discretionary accruals models (Peasnell et al., 2000b) and has therefore been widely used in academic research.

Second, managers can exercise their power over operation decisions to affect earnings. Graham et al. (2005) report that managers prefer real operation management to accruals management. This evidence suggests that to be relevant studies on earnings management should consider both accruals and real operation management. Although there is no agreement in the literature as to a standard

---

<sup>2</sup> At the time of revising this proposal, I have not done any empirical investigation on the third research question (i.e. whether it can be profitable to design a trading strategy that exploits the observed earnings management behaviours of managers). Therefore, section III, IV and V are presented in relation to the first and second research questions only.

model of real operation management, many types of real operation management have been recognised. Roychowdhury (2006) is the most notable study in this field, and finds that managers offer discounts to boost sales, over-produce to lower the cost of goods sold, or reduce discretionary expenses (such as research and development expenses) in an attempts to avoid reporting losses.

Motives to manage earnings can be grouped into two main categories. First, earnings can be opportunistically managed, such as to meet earnings benchmarks, maximise manager's benefits from stock compensation, or depress price prior to, for example, a management buyout (Perry and William, 1994; Teoh et al., 1998a&b; Peasnell et al., 2000a; Gore et al., 2007). Second, earnings management could be used to signal manager's private information to the market and enhance the usefulness of earning figures (Subramanyam, 1996). Research on earnings management incentives often concentrates on a group of firms sharing a common characteristic, which could represent the incentive for managing earnings, such as distressed firms, or firms that subsequently issue new equity. The direction of earnings management tends to be predictable conditional on manager's motives to manage earnings. For example, managers may hoard earnings for future use by employing earning-decreasing manipulation, such as when increasing current earnings could not lead to an increase in bonus due to compensation contracts (Healy, 1985); or earnings can be managed upwards in periods when debt covenants are likely to be violated.

Dye (1988) argues that the demand for earning management may come internally in attempts to minimize the costs of asymmetric information, or externally due to the firm's desire to affect prospective investor's perception about the firm's valuation. The above discussion of the literature reveals that market mispricing could be a motive for managers to use earnings as a signalling tool, in an attempt to correct the market. This question is still under-researched. Sawicki and Shrestha (2008) compare abnormal accruals across different quintiles of firms ranked by book-to-market ratio, and document no clear pattern to suggest that the level of accruals management is related to mispricing. Madhagarhia et al. (2009) find that glamour firms manage earnings, both upward and downward, more aggressively than value firms, due to the more severe asymmetric information experienced by glamour firms. Jensen (2005) predicts that over-priced firms employ earnings-increasing strategies to

sustain the overvaluation, and Chi and Gupta (2009) and Houmes and Skantz (2010) provide empirical evidence in supports of this prediction. However, the most serious concern about the extant evidence is whether the ‘suspect’ firms have a homogeneous motivation to manage earnings. Since different mispriced firms are likely to have diverse motives for managing earnings, expecting all firms to manage earnings in the same way is not entirely credible. For example, not all over-priced firms desire to sustain the overvaluation because, although there are benefits from a stock being overvalued, there are costs as well (Baker and Wurgler, 2002; Ducharme et al., 2004). Moreover, the extant literature is silent with regard to how firms manage real operations besides the traditional accruals management, which “arguably represents a more interesting and relevant research question” (Young, 2007). The proposed research is motivated by the above limitations of the current literature.

### **III. HYPOTHESIS DEVELOPMENT**

Jensen’s (2005) agency theory predicts that managers of overpriced firms would manipulate earnings upwards to maintain the overvaluation. Houmes and Skantz (2010) argue that firm managers may not necessarily always be aware whether their firms are overpriced or not. They therefore place their investigation on the groups of “highly valued” stocks and document that highly valued firms tend to use discretionary accruals to manage earnings upwards. Accruals management is obviously the only option to manipulate earnings. Roychowdhury (2006) documents that firms may deviate real operations from the optimal decisions to manipulate earnings, such as offering more discounts to boost sales up or cutting down discretionary expenses etc. If Jensen’s theory holds, I expect that overvalued firms would employ *both* accruals management and real operation management to inflate earnings. The first hypothesis is therefore:

***H1a: Overvalued firms employ income-increasing accruals management.***

***H1b: Overvalued firms employ income-increasing real operation management.***

Beside many benefits, there are also costs associated with overvaluation. Therefore, it is not completely irrational to expect managers of overvalued firms would try to correct the market

mispricing once they believe their firms are being overvalued. In short-term, managers of overpriced firms may try to avoid a sudden drop of stock price by manipulating earnings to justify the (too high) market valuation. But what do they have to do in long-term? It is obvious that the overvaluation could not be maintained forever. There comes a point where managers may not continue to use accruals management and real operation management anymore and have to switch to more pernicious earnings management, such as fraud etc. if they still want to maintain the overvaluation. I reckon that it is not a desirable option. Therefore, I conjecture that in long-term, managers would seek for a way to escape from the game of manipulating earnings to justify the (too high) market valuation. If this hypothesis holds, managers would signal their information to correct market mispricing rather than opportunistically manage earnings to maintain the overvaluation. Because accruals management will eventually reverse in long-term, real operation management would be the option for managers to signal to correct market mispricing. The second hypothesis is formulated as follows.

*H2a: In long-term, overpriced firms do not engage in accruals management*

*H2b: In long-term, overpriced firms engages in income-decreasing real operation management*

## **IV. DATA AND METHODOLOGY**

### ***IV.1. Calculations of variables***

#### **IV.1.1. Abnormal accruals**

The cross-sectional version of the modified-Jones model (Dechow et al., 1995) is estimated for each industry each year that have more than 10 observations. The two-digit SIC codes are used to define industries. For the purpose of estimating abnormal accruals, all observation with sufficient data for the below regression are used:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha + \beta_1 \left( \frac{1}{A_{i,t-1}} \right) + \beta_2 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left( \frac{PPE_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \quad (1)$$

where  $TA_{i,t}$  is total accruals of firm  $i$  at the end of year  $t$ , which is calculated as net income before extraordinary income and after preferred dividend minus cash flows from operations (taken from the Cash Flows Statements);  $A_{i,t-1}$  is total assets of firm  $i$  at the end of year  $t-1$ ;  $\Delta REV_{i,t}$ ,  $\Delta REC_{i,t}$  are changes in revenues and changes in receivables from year  $t-1$  to year  $t$  of firm  $i$ , respectively; and  $PPE_{i,t}$  is gross plant, property and equipment of firm  $i$  at the end of year  $t$ .

For each observation, the “normal” level of accruals is calculated as the predicted value of (1) using the estimated coefficients from the corresponding industry-year regression. The abnormal accruals (Ab\_ACC) are then computed as the deviation of the actual accruals from the “normal” level of accruals.

#### IV.1.2. Real operation management proxies

In this paper, three measures of real operation management introduced by Roychowdhury’s (2006) are estimated. Specifically, the below regressions are estimated for each industry-year that has more than 10 observations:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha + \beta_1 \left( \frac{1}{A_{i,t-1}} \right) + \beta_2 \left( \frac{REV_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left( \frac{\Delta REV_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \quad (2)$$

$$\frac{DEX_{i,t}}{A_{i,t-1}} = \alpha + \beta_1 \left( \frac{1}{A_{i,t-1}} \right) + \beta_2 \left( \frac{REV_{i,t-1}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \quad (3)$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha + \beta_1 \left( \frac{1}{A_{i,t-1}} \right) + \beta_2 \left( \frac{REV_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left( \frac{\Delta REV_{i,t}}{A_{i,t-1}} \right) + \beta_4 \left( \frac{\Delta REV_{i,t-1}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \quad (4)$$

For each model, all observations with sufficient data are used. Abnormal cash flows (Ab\_CFO), abnormal discretionary expenses (Ab\_DEX) and abnormal production costs (Ab\_PROB) are estimated in the same fashion as the estimation of abnormal accruals. Before proceeding, I multiply Ab\_CFO and Ab\_DEX by -1 so that a positive value will indicate upward earnings management.

Finally, I sum Ab\_CFO, Ab\_DEX and Ab\_PROD together to have a measure of total real operation management (RM\_TOTAL).

### **IV.1.3. Proxies for total earnings management**

To investigate the “total” effect of accruals management and real operation management, two different proxies are developed. First, I algebraically sum the four measures of earnings management (Ab\_AC, Ab\_CF, Ab\_DEX and Ab\_PROD) together to have the first proxy (EM\_4). The second proxy, EM\_2, is calculated as the sum between Ab\_AC and the average of Ab\_CF, Ab\_DEX and Ab\_PROD. Therefore, the construction of EM\_4 gives more weights to real operation management proxies while EM\_2 gives more weights to accruals management.

### **IV.1.4. Identification of overpriced firms**

For each year, stocks are grouped according to level 2 SIC. Those industry-year groups with less than 10 observations are excluded. In the fashion of a relative valuation model, overpriced stocks are identified as follows. For each industry-year (which arguably comprise of comparable firms), all stocks are ranked by book-to-market ratio. The 30<sup>th</sup> percentile is used as the benchmark of overvaluation, i.e. any stocks whose book-to-market ratio is below the benchmark is identified as overpriced firms.

## ***IV.2. Sample selection and descriptive statistics***

### **IV.2.1. Sample selection procedures**

For the purpose of this research, the UK market provides a very interesting setting. There is some evidence that UK firms are less likely to use accruals management in order to meet market expectations as compared with other earnings management approaches, such as earnings forecast guidance or classificatory decisions (Athanasakou et al., 2009). However, there is very limited evidence on the link between earnings management through real operation management and market

mispricing. Consequently, the proposed study will use a sample of UK listed stocks during the period 1995-2004. The sample excludes the pre-FRS1 period to ensure data availability, especially in relation to cash-flow-related variables<sup>3</sup>, and ends at 2004 to allow the follow-up in five years after the last period considered.

All data are downloaded from Datastream and Worldscope databases. To avoid survivorship bias, both live and dead stocks are selected. Similar to the common practice in this area, financial firms are also excluded. Stocks that have more than one type of ordinary shares are also excluded to avoid problems with apportioning firm-level earnings to each type of shares. Moreover, stocks whose book-to-market ratios are negative are also excluded to avoid problems associated with explaining negative book value in terms of market valuation. In addition, due to the use of relative valuation model in identifying mispriced stocks (described in section IV.1.3), any stocks that belong to a (level two SIC) industry-year with less than 10 observations are also dropped. Finally, for a stock to be included in the sample, all data needed to calculate the variables used in this paper must be available. This procedure results in a sample of 5,730 firm-year observations.

## **IV.2.2. Descriptive statistics**

Table 1 provides some basic descriptive statistics of the main sample.<sup>4</sup>

# **V. RESULTS**

## ***V.I. Validation test for the earnings management proxies used***

This research constructs some aggregated proxies for total earnings management (RM\_TOTAL, EM\_2, EM\_4), which, unlike proxies for accruals management, are not standard measures in the literature. Therefore, before proceeding, I perform a validation test to check if the proxies are not severely deteriorated. The validation test concentrates on the group of firms that just meet the zero

---

<sup>3</sup> Worldscope's cash flow data is very limited prior to the effective date of FRS 1 (Revised 1996).

<sup>4</sup> Discussion on the descriptive statistics is pending for now. At a glance, there seems to be no severe problems that can influence the main analysis.

benchmark. There are substantial evidence suggesting those firms engage in income-increasing earnings management (e.g. Roychowdhury, 2006). Therefore, the following regression is estimated:

$$Y_{i,t} = \alpha + \beta_1(SIZE_{i,t-1}) + \beta_2(BM_{i,t-1}) + \beta_3(ROA_{i,t}) + \beta_4(JB_{i,t}) + \varepsilon_{i,t} \quad (5)$$

Where Y is replaced by Ab\_ACC, Ab\_CFO, Ab\_DISEX, Ab\_PROD, RM\_TOTAL, EM\_2 and EM\_4 one after the other;  $BM_{i,t-1}$  is book-to-market ratio of the firm at the beginning of year  $t$  (book value of common equity divided by market value), measured as the deviation from the median of the corresponding industry-year;  $Size_{i,t-1}$  is natural log of the firm's market value at the beginning of year  $t$ , measured as the deviation from the median of the corresponding industry-year;  $ROA_{i,t-1}$  is returns on assets in year  $t$  (net income before extraordinary income and after preferred dividend divided by lagged assets), measured as the deviation from the median of the corresponding industry-year;  $JB_{i,t}$  is a dummy variable that takes the value of 1 if the firm's ROA ranges from 0 to 0.005 in year  $t$ .

In the fashion of Fama-MacBeth methodology, the regressions are run in each year in the sample and the reported coefficients are the average across the yearly estimated coefficients. The t-statistics are calculated using the distribution of the yearly coefficients with the standard errors corrected for autocorrelation using Newey-West procedure<sup>5</sup>. The results are in Table 2.

The results as reported in Table 2 generally suggest that firms that just beat the zero benchmark are associated with income-increasing earnings management. The results are consistent across different proxies for earnings management, suggesting that the proxies constructed are not severely problematic.

## ***V.2. Earnings management by overpriced firms in the first year of being overvalued***

To test hypotheses H1a and H1b, the following regressions are estimated:

$$Y_{i,t} = \alpha + \beta_1(SIZE_{i,t-1}) + \beta_2(BM_{i,t-1}) + \beta_3(ROA_{i,t}) + \beta_4(OV_{i,t-1}) + \varepsilon_{i,t} \quad (6)$$

---

<sup>5</sup> Using the two-way clustered standard errors as suggested by Petersen (2009) and Gow et al. (2009) would yield the results which is qualitatively the same as those reported here.

Where Y is replaced by Ab\_ACC, Ab\_CFO, Ab\_DISEX, Ab\_PROD, RM\_TOTAL, EM\_2 and EM\_4 one after the other;  $OV_{i,t-1}$  is a dummy variable that takes the value of 1 if the firm is identified as an overvalued firm at the beginning of the period using the procedure described in section IV.1.4. The other variables are similar to those defined in equation (5). All the regressions are Fama-MacBeth styled and the standard errors are corrected for autocorrelation using Newey-West procedure. The results are reported in Table 3.

The first two columns of Table 3 show that overpriced firms have significantly higher abnormal accruals in year t (the coefficient is 0.0145 with t-statistic of 2.7). This suggests that upon observing the beginning market valuation, managers of overpriced firms tends to manage earnings upward using accruals management. This evidence is consistent with the growing empirical evidence that supports Jensen's (2005) hypothesis (e.g. Chi and Gupta, 2009; Houmes and Skantz, 2010 etc.). With regard to cash flows, there is evidence that overpriced firms tend to deviate from optimal business decisions to temporarily boost sales up (by offering more discount or lenient credit terms). Assuming positive margin, more sales generally means more profits. Thus, the evidence regarding earnings management through sales manipulation seems to be in line again with Jensen's hypothesis.

However, it seems that, at the same time, managers of overpriced firms tend to deviate from normal business decisions to depress earnings down when it comes to deciding the levels of discretionary expenses and production volumes. The coefficients of OV in the regression when Ab\_DEX (Ab\_PROD) is the dependent variable is -0.0781 (-0.0362) with a very high t-statistic of -5.172 (-4.733). The evidence of downward earnings management using reduction of discretionary expenses and overproduction is so strong that when combined with sales manipulation, the overall evidence of real operation management is clearly an income-decreasing attempt (coefficient of OV is -0.0853 with t-statistic of -4.694 when RM\_TOTAL is the dependent variable).

Because the evidence of accruals and real operation management are in contrast, it is interesting to try looking at the "net" effect on earnings. When EM\_2 is used as the dependent variable, there seems to

be no evidence of earnings management at all (since the coefficient of OV is statistically insignificant). However, when more weights are given to real operation management proxies, the regression with EM\_4 as the dependent variable provides an interesting evidence of downward earnings management, which seems to be in contrast to Jensen's (2005) hypothesis (coefficient is -0.0708 with t-statistic of -3.806).

In conclusion, in year t there seems to be a conflict when ones look at accruals management and real operation management separately. Why at a same time, given the same observed market valuation, do managers of overpriced firms inflate earnings by accruals management but try to depress it using real operation management? It is important to understand that the timing of different earnings management strategies are not the same. Offering more price discount and more lenient credit terms or exercising accounting manipulation do not require ahead-planning, but most of important expenses and production volumes do. The above discussed evidence is consistent with the scenario where managers decide the levels of reduction of discretionary expenses and overproduction in the previous period, and upon observing market overvaluation they exercise accruals and sales manipulation opportunistically during the period to temporarily justify the (too high) market price. I would interpret this evidence as still in line with Jensen's (2005) hypothesis which predicts opportunistic earnings management by overpriced firms.

### ***V.3. Earnings management by overpriced firms in five years after being overvalued***

To test hypotheses H2a and H2b, the following regressions are first estimated:

$$Y_{i,t+j} = \alpha + \beta_1(SIZE_{i,t+j-1}) + \beta_2(BM_{i,t+j-1}) + \beta_3(ROA_{i,t+j}) + \beta_4(OV_{i,t-1}) + \varepsilon_{i,t} \quad (7)$$

$$Y_{i,t \text{ to } t+j} = \alpha + \beta_1(SIZE_{i,t-1}) + \beta_2(BM_{i,t-1}) + \beta_3(ROA_{i,t \text{ to } t+j}) + \beta_4(OV_{i,t-1}) + \varepsilon_{i,t} \quad (8)$$

In equation (7), Y is replaced by Ab\_ACC, Ab\_CFO, Ab\_DISEX, Ab\_PROD, RM\_TOTAL, EM\_2 and EM\_4 in year t+j (j=1, 2, 3, 4) one after the other. In equation (8), Y is replaced by Ab\_ACC,

Ab\_CFO, Ab\_DISEX, Ab\_PROD, RM\_TOTAL, EM\_2 and EM\_4 accumulated from year  $t$  to year  $t+j$  ( $j=1, 2, 3, 4$ ) one after the other. The other variables are similar to those defined in equation (5) and (6). All the regressions are Fama-MacBeth styled and the standard errors are corrected for autocorrelation using Newey-West procedure. The results are reported in Table 3.

When the dependent variable is replaced by Ab\_AC in year  $t+1$ ,  $t+2$ ,  $t+3$  and  $t+4$ , the coefficients of OV are all negative (only statistically significant in year  $t+2$  and  $t+3$ ). When Ab\_AC is accumulated from year  $t$  up to 4 years after that, the coefficient of OV is only significant in up to 1 year (coefficient is 0.0197 with t-statistic of 2.213). In other words, if one takes a longer view, there seems to be no evidence of accruals management in up to five years after the firm is overvalued. The evidence is therefore in line with hypothesis *H2a*. This evidence is not surprising given the nature of accruals management. To continue to maintain market overvaluation, more upward earnings management must be engaged. But it is quite well understood that accruals management will eventually, sooner or later, reverse. Therefore, in long-term accruals management is not a “sustainable” strategy to maintain market overvaluation.

Therefore, if managers want to maintain the overvaluation in long-term, it is more likely that real operation management is the option. After manipulating sales upward in year  $t$ , overpriced firms tend to stricter sales policies in the subsequent years. Abnormal cash flows in 1, 2, 3 and 4 years ahead are shown to be negatively related to OV. Again, it is very similar to accruals management, when Ab\_CF is accumulated in up to 5 years after the firms being overvalued, there is very little evidence of earnings management. Thus, it is concluded that sales manipulation is not the choice for managers to maintain overvaluation in long-term.

Now let us look at the most interesting piece of evidence. Real operation management via adjusting the levels of discretionary expenses and production volumes in long-term provides very strong evidence in support of the signalling hypothesis. Overpriced firms seem to consistently have abnormally high discretionary expenses and under-produce in up to five years after being overpriced. All the coefficients of OV in year  $t+1$ ,  $t+2$ ,  $t+3$  and  $t+4$  are negatively and highly statistically

significant when either Ab\_DEX or Ab\_PROD is used as the dependent variable. On a cumulative basis, there are also very strong evidence that overpriced firms manage earnings downward in up to five years after being overpriced.

The downward earnings management by reduction of discretionary and under-production is so pervasive that when aggregated with sales manipulation, the evidence strongly suggests that overpriced firms engage in income-decreasing real operation management. When combined with accruals management, both measures of total earnings management (EM\_2 and EM\_4) provide strong evidence that overpriced firms are associated with income-decreasing earnings management in up to five years after being overvalued.

Overall, the evidence implies that in long-term managers of overpriced firms do not attempt to maintain the overvaluation. Instead, they try to signal the information to correct the market mispricing. Is this behaviour rational, given it seems to be in contrast to Jensen's story? First, it is not new that among other things, earnings management could be a signalling tool for managers (e.g. Subramanyam, 1996). Second, of course some managers will be trapped inside the game of overvaluation as Jensen discussed, but it is reasonable to believe that the majority of them would prefer to escape the game in longer terms. All they need is to avoid an immediate market disappointment which could potentially result in a sudden price drop (which is often very painful to managers in terms of their job security and reputation and dangerous to the firm as a whole in terms of losing investor's trusts). But because such disappointment could not be delayed forever (because being overpriced, by definition, means the firms could not deliver what the market expects), in equilibrium the most "sustainable" strategy must be that managers will "guide" the market towards the intrinsic value of the firm in a "safe" way. My evidence suggests that in long-term (up to 5 years), managers of overpriced firms engage in reduction of discretionary and under-production to correct market overvaluation. This is not a reject of Jensen's hypothesis, but rather it is an important extension to the hypothesis.

## **VI. POSSIBLE DIRECTION TO INVESTIGATE THE PROFITABILITY OF EXPLOITING MANAGER'S EARNINGS MANAGEMENT BEHAVIOURS**

To develop trading strategies that can exploit the earnings management behaviour documented in the earlier part of the study, firstly the managed components of earnings (both through accruals and real operation management) will be 'peeled off' to estimate the 'pre-managed' earnings. The 'pre-managed' earnings will then be employed to identify the 'truly' under-priced and 'truly' over-priced stocks. The profitability of trading strategies that take long positions in the 'truly' under-priced stocks and short positions in the 'truly' over-priced stocks will be examined.

## BIBLIOGRAPHY

- Athanasakou, V., Strong, N. & Walker, M. (2009) 'Earnings management or forecast guidance to meet analyst expectations?', *Accounting and Business Research*, 39(1), pp. 3-35.
- Baker, M. and Wurgler, J. (2002), 'Market Timing and Capital Structure', *Journal of Finance*, 57, pp. 1–32.
- Chi, J. & Gupta M. (2009) 'Overvaluation and earnings management', Working Paper, Arizona State University.
- Dechow, P., Sloan, R. & Sweeney, A. (1995) 'Detecting earnings management', *The Accounting Review*, 70, pp. 3–42.
- DeFond, M., Jiambalvo, J. (1994) 'Debt covenant violation and manipulation of accruals: accounting choice in troubled companies', *Journal of Accounting and Economics*, 17, pp. 145–176.
- DuCharme, L., Malatesta, P. & Sefcik, S. (2004), 'Earnings Management, Stock Issues, and Shareholder Lawsuits', *Journal of Financial Economics*, 71, pp. 27–49.
- Gore J., Pope P. & Singh A. (2007) 'Earnings management and the distribution of earnings relative to targets: UK evidence', *Accounting and Business Research*, 37(2), pp. 123-150.
- Gow, I., Ormazabal, G. & Taylor, D. (2009), 'Correcting for Cross-Sectional and Time-Series Dependence in Accounting Research', *Accounting Review*, Forthcoming.
- Graham, J., Harvey C. & Rajgopal S. (2005), 'The Economic Implications of Corporate Financial Reporting', *Journal of Accounting and Economics*, 40(1–3), pp. 3–73.
- Houmes, R. & Skantz, T. (2010) 'Highly Valued Equity and Discretionary Accruals', *Journal of Business Finance & Accounting*, 37(1-2), pp. 60–92.
- Jensen, M. (2005) 'Agency costs of overvalued equity', *Financial Management*, 34, pp. 5-19.
- Jones, J. (1991) 'Earnings management during import relief investigations', *Journal of Accounting Research*, 29, pp. 193–228.
- Madhogarhia, P., Sutton, N., & Kohers, T. (2009) 'Earnings management practices among growth and value firms', *Applied Financial Economics*, 19(22), pp. 1767-1778.

- Peasnell K. V. , Pope P. F. & Young S. E. (2000a) 'Accrual management to meet earnings targets: UK evidence pre- and post-Cadbury', *British Accounting Review*, 32(4), pp. 415-445.
- Peasnell K. V. , Pope P. F. & Young S. E. (2000b) 'Detecting earnings management using cross-sectional abnormal accruals models', *Accounting and Business Research*, 30(4), pp. 313-326.
- Perry, S. & Williams T. (1994) 'Earnings Management Preceding Management Buyout Offers', *Journal of Accounting & Economics*, 18, pp. 157–79.
- Petersen, M. A. (2009) 'Estimating standard errors in finance panel data sets: Comparing approaches', *Review of Financial Studies*, 22 (1), pp. 435-480.
- Roychowdhury, S. (2006). 'Management of earnings through the manipulation of real activities that affect cash flow from operations'. *Journal of Accounting and Economics*, 42(3), pp. 335–370.
- Sawicki, J. & Shrestha, K. (2008) 'Insider Trading and Earnings Management', *Journal of Business Finance & Accounting*, 35, pp. 331-346
- Subramanyam, K. (1996), 'The Pricing of Discretionary Accruals', *Journal of Accounting and Economics*, 22, pp. 249–81.
- Teoh, S. H., Welch, I. & Wong, T.J. (1998a) 'Earnings Management and the Underperformance of Seasoned Equity Offerings', *Journal of Financial Economics*, 50, pp. 63–99.
- Teoh, S. H., Welch, I. & Wong, T.J. (1998b) 'Earnings Management and the Long-Run Underperformance of Initial Public Offerings', *Journal of Finance*, 53, pp. 1935–74.
- Young S. E. (2008) 'Discussion of Do acquirers manage earnings prior to a share for share bid?', *Journal of Business Finance and Accounting*, 35(5/6), pp. 671-678.

**Table 1: Descriptive Statistics (n = 5,730)**

	WMVYE	WC_BM	WC_ROA	WC_AC_A	WC_CF_A	WC_DEX_A	WC_PROD_A	WC_AB_AC	WC_AB_CF	WC_AB_DEX	WC_AB_PROD	WC_RM_TOTAL	WC_EM_2	WC_EM_4
Mean	318,360	0.7047	-0.0284	-0.0586	0.0311	0.4397	0.9508	0.0064	-0.0084	0.0186	-0.0109	0.0062	0.0085	0.0126
Median	46,203	0.5267	0.0451	-0.0443	0.0731	0.3180	0.7609	0.0102	-0.0156	0.0373	-0.0004	0.0286	0.0171	0.0343
Maximum	7,862,045	3.4295	0.5222	0.7233	0.6344	4.8287	5.0469	0.6873	1.7701	0.9054	1.0650	2.0700	1.3773	2.7572
Minimum	678	0.0003	-3.3166	-1.4424	-2.6598	0.0100	-0.0023	-0.8930	-0.8596	-2.9468	-0.9725	-2.2958	-1.6582	-3.1887
Std. Dev.	977,125	0.6092	0.3278	0.1739	0.2707	0.4779	0.8725	0.1477	0.1989	0.3350	0.2450	0.5534	0.2780	0.6263

**Table 2: Regression of earnings management proxies on the indicator of firms that just beat the zero benchmark**

Dependent variable	Independent variable	Coef.	t-stat
Ab_AC	C	0.018682	3.064**
	Size	-0.007461	-2.478**
	BM	-0.012107	-1.253
	ROA	0.296467	9.416***
	JB	0.016676	2.161*
Ab_CF	C	-0.027469	-3.448***
	Size	-0.000642	-1.001
	BM	-0.007085	-2.214*
	ROA	-0.316068	-9.46***
	JB	0.044196	4.764***
Ab_DEX	C	0.028758	3.443***
	Size	0.004816	1.241
	BM	0.097057	9.43***
	ROA	0.257941	3.261***
	JB	0.009696	0.754
Ab_PROD	C	-0.026255	-9.673***
	Size	0.005804	1.883*
	BM	0.073675	19.432***
	ROA	-0.116805	-2.769**
	JB	0.035224	2.325**
RM_TOTAL	C	-0.002753	-0.283
	Size	0.001209	0.241
	BM	0.150252	10.774***
	ROA	0.192093	1.877*
	JB	0.104697	2.65**
EM_2	C	0.017765	2.072*
	Size	-0.007058	-2.441**
	BM	0.037977	2.896**
	ROA	0.360498	7.563***
	JB	0.051574	2.547**
EM_4	C	0.015929	1.101
	Size	-0.006252	-1.282
	BM	0.138145	6.449***
	ROA	0.48856	4.495***
	JB	0.121372	2.617**

**Table 3: Regressions of earnings management proxies on indicator of overpriced firms**

Dependent variable	Independent variable	t		t+1		t+2		t+3		t+4	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Ab_AC	C	0.013705	3.027**	0.015657	3.118**	0.021166	6.731***	0.023139	9.749***	0.020233	5.111***
	Size	-0.007824	-2.48**	-0.007407	-3.062**	-0.007691	-3.768***	-0.010113	-5.606***	-0.009442	-5.424***
	BM	-0.006103	-0.763	-0.014634	-1.555	-0.023421	-2.158*	-0.019189	-1.727	-0.017257	-2.792**
	ROA	0.298528	9.65***	0.289428	8.553***	0.245232	6.274***	0.347264	6.758***	0.350772	7.585***
	OV	0.014474	2.7**	-0.001461	-0.334	-0.014194	-3.831***	-0.008801	-2.846**	-0.005368	-0.984
Ab_CF	C	-0.031071	-3.286***	-0.028804	-3.57***	-0.026972	-3.064**	-0.028552	-3.493***	-0.030184	-3.439***
	Size	-0.000873	-1.279	-0.000816	-0.709	-0.000762	-0.526	-0.000536	-0.35	-0.000446	-0.281
	BM	-0.001349	-0.572	-0.010977	-5.144***	-0.015683	-3.17**	-0.002593	-0.474	-0.004229	-2.462**
	ROA	-0.314665	-9.722***	-0.3618	-8.329***	-0.39323	-6.305***	-0.353761	-5.479***	-0.352661	-4.974***
	OV	0.01158	2.23*	-0.006811	-1.671	-0.014271	-3.757***	-0.016982	-4.014***	-0.012506	-4.958***
Ad_DEX	C	0.05705	5.105***	0.046649	6.265***	0.047851	5.395***	0.050095	7.129***	0.044073	6.579***
	Size	0.006597	1.614	0.010094	3.847***	0.012833	3.832***	0.015468	3.781***	0.015416	4.215***
	BM	0.059865	7.749***	0.094622	15.87***	0.100377	14.81***	0.098771	14.635***	0.10685	16.048***
	ROA	0.255973	3.357***	0.307541	3.669***	0.385867	3.709***	0.37336	3.427***	0.387553	3.52***
	OV	-0.078066	-5.172***	-0.041334	-12.277***	-0.035548	-5.791***	-0.042769	-5.32***	-0.036415	-3.014**
Ab_PROD	C	-0.012643	-2.743**	-0.01645	-3.979***	-0.010161	-1.729	-0.007408	-1.319	-0.006403	-1.211
	Size	0.006646	2.165*	0.00846	2.869**	0.010977	5.159***	0.012579	4.122***	0.012157	3.266***
	BM	0.057287	16.621***	0.069188	20.97***	0.063919	7.916***	0.070696	10.01***	0.070019	10.174***
	ROA	-0.117474	-2.833**	-0.121285	-4.266***	-0.149143	-2.717**	-0.139293	-3.157**	-0.129599	-2.542**
	OV	-0.036225	-4.733***	-0.027288	-4.485***	-0.04582	-7.182***	-0.056311	-8.774***	-0.048216	-11.152***
RM_TOTAL	C	0.029479	2.016*	0.019728	1.448	0.034768	2.856**	0.040669	3.141**	0.032195	2.415**
	Size	0.003182	0.666	0.009547	2.262*	0.014457	3.335***	0.015916	2.79**	0.015351	2.648**
	BM	0.109982	15.113***	0.134991	9.9***	0.120903	5.221***	0.143316	6.862***	0.14915	10.487***
	ROA	0.19251	1.922*	0.139858	1.431	0.102314	0.685	0.23597	2.22*	0.264267	2.552**
	OV	-0.085295	-4.694***	-0.077991	-6.075***	-0.114901	-10.506***	-0.127588	-9.372***	-0.103951	-12.308***
EM_2	C	0.023531	2.794**	0.022233	2.612**	0.032755	6.803***	0.036695	6.318***	0.030965	4.359***
	Size	-0.006763	-2.326**	-0.004224	-2.163*	-0.002872	-1.471	-0.004807	-2.018*	-0.004325	-1.68
	BM	0.030558	3.18**	0.030363	2.274**	0.01688	0.959	0.028583	1.641	0.032459	3.362***
	ROA	0.362698	7.74***	0.336047	6.377***	0.279337	3.682***	0.42592	5.724***	0.438861	5.55***
	OV	-0.013958	-1.784	-0.027458	-3.527***	-0.052494	-9.407***	-0.05133	-7.616***	-0.040018	-8.348***
EM_4	C	0.043184	2.436**	0.035385	2.075*	0.055933	4.588***	0.063807	4.493***	0.052428	3.394***
	Size	-0.004642	-1.021	0.002141	0.628	0.006766	1.711	0.005804	1.023	0.005909	0.982
	BM	0.103879	7.648***	0.120357	5.483***	0.097482	3.006**	0.124127	4.019***	0.131892	7.173***
	ROA	0.491038	4.607***	0.429286	3.855***	0.347547	2.038*	0.583234	4.247***	0.615039	4.182***
	OV	-0.070821	-3.806***	-0.079453	-4.991***	-0.129094	-10.695***	-0.136389	-8.791***	-0.109319	-14.489***

Table 3 (continued)

Dependent variable	Independent variable	t to t+4		t to t+3		t to t+2		t to t+1	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Ab_AC	C	0.0620	7.15***	0.049413	6.246***	0.03425	3.877***	0.021359	2.881**
	Size	-0.0215	-3.578***	-0.01926	-3.053**	-0.016305	-2.888**	-0.012269	-2.574**
	BM	0.0013	0.182	-0.004069	-0.32	-0.007913	-0.854	-0.00522	-0.441
	ROA	0.1568	5.474***	0.175064	5.485***	0.197416	6.499***	0.236116	7.834***
	OV	0.0032	0.146	0.00475	0.309	0.012209	0.805	0.019708	2.123*
Ab_CF	C	-0.1995	-4.082***	-0.145677	-4.297***	-0.10535	-3.862***	-0.066236	-3.738***
	Size	0.0130	3.076**	0.006604	2.26*	0.003939	1.483	0.000746	0.466
	BM	0.0121	1.501	0.003801	0.512	0.001186	0.174	-0.001092	-0.228
	ROA	-0.4068	-9.439***	-0.403886	-10.056***	-0.392407	-9.117***	-0.374134	-10.322***
	OV	-0.0288	-1.616	-0.017685	-1.383	0.000402	0.043	0.009813	1.256
Ad_DEX	C	0.3197	8.654***	0.242695	8.415***	0.169517	7.085***	0.110293	6.367***
	Size	0.0341	2*	0.032799	2.266**	0.024106	2.233*	0.016126	2.07*
	BM	0.3296	4.755***	0.256889	6.687***	0.188003	8.793***	0.128832	14.035***
	ROA	0.3178	2.495**	0.298401	2.401**	0.28199	2.608**	0.273964	2.888**
	OV	-0.2526	-6.385***	-0.222374	-8.092***	-0.174896	-8.893***	-0.130117	-6.601***
Ab_PROD	C	-0.0378	-1.749	-0.040672	-2.152*	-0.041359	-2.918**	-0.029377	-3.53***
	Size	0.0408	3.892***	0.033873	3.51***	0.024016	2.925**	0.015062	2.165*
	BM	0.2711	8.781***	0.224336	10.288***	0.167807	14.06***	0.116291	14.915***
	ROA	-0.2372	-4.373***	-0.210193	-4.311***	-0.19016	-4.287***	-0.161536	-5.76***
	OV	-0.2492	-13.748***	-0.185243	-11.31***	-0.114098	-5.808***	-0.064942	-4.311***
RM_TOTAL	C	0.1503	2.819**	0.110657	2.536**	0.062256	1.713	0.040635	1.464
	Size	0.0646	3.27***	0.052329	3.185**	0.033436	2.531**	0.017248	1.533
	BM	0.6101	7.12***	0.476176	8.885***	0.344384	11.869***	0.235794	14.994***
	ROA	-0.1461	-1.103	-0.123616	-0.885	-0.087413	-0.661	0.009818	0.098
	OV	-0.5344	-8.548***	-0.426002	-10.463***	-0.280432	-6.828***	-0.166023	-4.833***
EM_2	C	0.1121	4.655***	0.086299	4.637***	0.055003	2.974**	0.034904	2.261*
	Size	0.0001	0.014	-0.001817	-0.695	-0.00516	-2.254*	-0.00652	-1.886*
	BM	0.2047	6.046***	0.154656	5.388***	0.106882	6.209***	0.073378	4.647***
	ROA	0.1081	2.533**	0.133859	2.673**	0.168278	3.131**	0.239388	5.016***
	OV	-0.1749	-4.708***	-0.13725	-6.569***	-0.081269	-3.524***	-0.035633	-2.323**
EM_4	C	0.2123	3.597***	0.160071	3.426***	0.096507	2.306**	0.061994	1.854*
	Size	0.0431	2.747**	0.033069	3.008**	0.017131	2.073*	0.004979	0.576
	BM	0.6114	6.742***	0.472106	7.407***	0.336472	9.41***	0.230574	9.167***
	ROA	0.0106	0.085	0.051448	0.378	0.110003	0.809	0.245934	2.272**
	OV	-0.5312	-6.975***	-0.421252	-9.558***	-0.268224	-5.642***	-0.146315	-4.026***

