

The Use of Extended Credit (Channel Stuffing) to Avoid Reporting Losses

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Abstract

This study investigates whether managers grant extended credit at the end of the fiscal year to accelerate customer purchases and thus avoid reporting losses. This study also considers whether this kind of earnings management affects the information content of reported earnings, and whether the unexpected accounts receivable (UAR)—a relatively reliable measure of management’s exercise of channel stuffing over earnings—can provide incremental information about this phenomenon. Consistent with our hypotheses, we find that managers are likely to grant extended credit at the end of the fiscal year to meet their annual financial reporting targets.

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1. Introduction

Accounting standards are designed to ensure that a firm’s financial statements accurately and reliably reflect the firm’s performance. Unfortunately, this is not always the case because managers often manipulate reported earnings in order to avoid reporting losses. At the present time, adequate standards do not exist which limit the

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degree to which managers can exercise judgment in financial reporting.¹ For such standards to be established, it is important to know the magnitude and frequency of earnings management and its resource allocation effects (Healy and Wahlen, 1999). This study addresses these issues.

Channel stuffing, or trade loading, is a common practice seen at all levels of business. This practice takes various forms. For example, in the United States it frequently takes the form of reduced pricing (Jackson and Wilcox, 2000), whereas in Taiwan it often takes the form of extended credit (Infotimes Co. News Team, 2002; Ma, 2002a; Ma, 2002b; Que, 2002; Yeh, 2004). In other cases, manufacturers may allow the return of unsold merchandise well beyond the period that is typical in a normal return policy.

Although channel stuffing takes various forms, its purpose is always the same: it allows companies to escape an immediate revenue shortfall by, in effect, smoothing income.² This, in turn, alters the financial statements of the companies and thus affects the information provided to investors.

Channel stuffing is not always synonymous with earnings management. Earnings management may be part of the normal operations of a business. For example, earnings management can result from valid promotional activities associated with launching a new product. Firms that deal with perishable inventories may offer extended credit or price reductions to reduce losses due to spoilage. This is part of the normal operations of the business. However, when extended credit or price deductions are offered for the sole purpose of increasing earnings to avoid reporting losses, then earnings management becomes channel stuffing or trade loading. In other words, it is the motivation behind the earnings management that determines whether it is a normal part of doing business or whether it is channel stuffing. This paper is concerned with channel stuffing activities.

Although channel stuffing is not technically in violation of generally accepted accounting principles (GAAP), it is a questionable activity. Because of its dubious nature, the contact lens division of Bausch and Lomb, Coca Cola and many other companies endured the scrutiny of the U.S. Securities and Exchange Commission (SEC) when they engaged in channel stuffing and other activities designed to increase reported earnings.³ Further, channel stuffing is also considered at least partially responsible for two of the most notorious financial frauds committed in Taiwan: Coretronic Corp in 1997 and Procomp Informatics Ltd in 2003.

Because channel stuffing is fairly common and because of its questionable ethics and the significant effect it has on the information provided to investors, we believe that it deserves further investigation. This study is designed to accomplish this.

This research examines the use of extended credit as one form of channel stuffing to avoid reporting losses. We also investigate how the practice of channel stuffing

¹ Although the SEC has a set of rules known as the Stewart Parness Criteria, they do not cover all instances of channel stuffing.

² The earnings-smoothing hypothesis predicts that managers have incentives to smooth reported earnings around some levels which are considered normal for the firm (see, for example, Ronen and Sadan, 1981; Bartov, 1993).

³ For elaboration on this matter, see Plunkett and Rouse (1998) and the Securities and Exchange Commission (1997).

distorts the earnings information provided to investors. Finally, we examine whether the unexpected accounts receivable (UAR) measurement, which is considered to be a relatively reliable measure of the use of channel stuffing, can provide incremental information about this practice.

Consistent with our hypotheses, we find that managers are likely to grant extended credit at the end of the fiscal period in order to meet their financial reporting targets, and that this kind of earnings manipulation distorts the relationship between stock returns and reported earnings. Finally, our findings do not confirm that when extended credit is granted, the UAR measure can provide incremental information.

The following section provides background information regarding channel stuffing in Taiwan and develops the research hypotheses tested in this study. Section 3 discusses the research design, including sample selection, variable measurement, and model estimation. Section 4 presents the empirical results, and the last section presents our conclusions.

2. Background and Hypothesis Development

Channel stuffing can take various forms. For example, in the United States, managers increase sales by reducing prices or by granting very generous return policies (Sauer, 2002). In Taiwan, managers induce overbuying mainly by granting extended credit. These differing approaches to channel stuffing have different consequences. Granting extended credit has a greater income-increasing effect than granting price discounts, but from the perspective of increasing total sales, the effect of granting discounts may be greater. Further, the effect on cash flow of receiving immediate payment when granting price reductions, as opposed to delayed payments when granting extended credit, cannot be overlooked.

Channel stuffing may take different forms and may not be restricted to the forms as practiced in the U.S. or Taiwan.⁴ Nonetheless, there are commonalities found in all the forms of channel stuffing and in order to study complex events, parameters must be specified. Thus, this research will focus on the use of extended credit as one form of channel stuffing.

2.1 Reported Earnings and Extended Credit

An increase in sales is the result of all forms of channel stuffing. However, sales or cash flow may not be the most important factor. A wealth of evidence on the stock market effect of earnings numbers indicates that investors view earnings data as far more relevant than sales or cash flow information for making investment decisions (Dechow, 1994). Since the use of extended credit is expected to increase reported earnings to a greater extent than, for example, the use of price reductions, the current study investigates channel stuffing in the form of extended credit.

⁴ We tried to identify firms that exhort their subsidiaries to overbuy products by comparing the financial data of their parent firms and related consolidated statements (see footnote 7). Unfortunately, the identified sample was too small for reliable statistical tests.

2.2 *The Need to Avoid Reporting Losses*

Managers go to great lengths to avoid reporting losses. Fox (1997) claims that managers manipulate reported earnings so that an increasing earnings trend can be reported. Smith et al. (1994) show that firms try to smooth earnings by timing the recognition of gains and losses. Jackson and Wilcox (2000) and Barth et al. (1999) note that a perception exists among corporate executives that if they fail to produce consistently higher earnings, the value of their firms' stock will suffer. Hayn (1995) and Burgstahler and Dichev (1997) conclude that managers manipulate reported earnings and operating decisions to avoid losses.

Several recent studies have identified three earnings thresholds or benchmarks: (1) the need to avoid reporting losses; (2) the need to report an increase in earnings; and (3) the need to meet analysts' expectations for earnings (Hayn, 1995; Burgstahler and Dichev, 1997; Degeorge et al., 1999). These studies show that managers rarely report small losses, but routinely report small profits. These investigators interpret their findings as evidence that managers manipulate earnings and alter operating decisions in order to avoid reporting losses.

Degeorge et al. (1999) provide evidence of a hierarchy among these three earnings thresholds, and find that relative to the other two thresholds, the need to avoid reporting losses is primary. Once a profit has been achieved, however, then the need to report increases in earnings and the desire to meet analysts' expectations become relevant. In other words, if a firm has negative earnings, then managing earnings to show increases or to meet analysts' expectations is meaningless. We find that in Taiwan this hierarchy is also applicable: managers consider the need to report sustained earnings growth or to meet analysts' expectations only after the firms are profitable. Thus, similar to Jackson and Wilcox's (2000) research, we focus on one simple benchmark and examine whether managers grant extended credit (channel stuffing) in order to avoid reporting losses. This leads to our first hypothesis⁵:

Hypothesis 1 (H1): Managers grant extended credit (channel stuffing) to avoid reporting losses.

2.3 *The Information Content of Reported Earnings*

Considerable evidence on the stock market effect of earnings numbers clearly indicates that investors view earnings data as far more informative than cash flow data, implying that accruals still play an important role in portraying firm performance. This finding has been replicated many times and in many different countries (Kothari, 2001).

According to Leuz et al. (2003), however, undetected earnings management has the potential to decrease the perceived quality of reported earnings, and channel stuffing achieved by "recurring items" is likely to have a significant effect on the quality of reported earnings. Therefore, when managers use channel stuffing in order to avoid reporting losses, we would expect the quality of reported earnings or the information content of reported earnings to decrease. This leads to our second hypothesis:

⁵ All hypotheses are stated in the alternate form.

Hypothesis 2 (H2): Granting extended credit (channel stuffing) negatively affects the information content of reported earnings.

2.4 Incremental Information of Unexpected Accounts Receivable (UAR) About Channel Stuffing

A number of studies have examined stock price responses to abnormal accruals to determine whether investors fixate on reported earnings or are more sophisticated in processing accounting information (Kothari, 2001). Studies of loan loss accruals in the banking industry show that stock returns are negatively related to normal changes in loan loss provisions, and are positively related to abnormal loan loss provisions (Beaver and Engel, 1996). One interpretation of these findings is that investors view normal loan loss provisions as reflecting an underlying problem in the portfolio performance, but suspect abnormally low loan loss provisions as being the result of earnings management. This implies that abnormal accruals can convey information about earnings management. Similar results have emerged from stock returns associated with unexpected claim loss reserve revisions for property casualty-insurers (Petroni, 1992).

Because channel stuffing in Taiwan takes the form of extended credit, we can use a relatively reliable measure of management's use of channel stuffing. In accordance with Dechow et al. (2003) and Marquardt and Wiedman (2004) we use the measure of unexpected accounts receivable (UAR), and expect this discretionary accrual to help explain contemporaneous firm performance and provide incremental information about earnings, especially for those firms with low positive earnings levels which are suspected of engaging in channel stuffing. This leads to our third hypothesis as follows:

Hypothesis 3 (H3): When managers grant extended credit to avoid reporting losses, the unexpected accounts receivable (UAR) can provide incremental information about channel stuffing.

3. Data and Research Design

3.1 Data

Our sample includes all publicly-held industrial firms in Taiwan for the period 1990–2003 (right after the promulgation of Taiwan's accounting standard for the statement of cash flow in 1989).⁶ We obtained the data from the *Taiwan Economic Journal* (TEJ) database.

Due to the impact of reducing income in the future, the potential cost of using channel stuffing to manage earnings can be high. This "reversal effect" is likely to be

⁶ Later tests will decompose earnings into cash flow from operations and total accruals, and Taiwan's 1989 Accounting Standard allows us to take the CFO data directly from the statement of cash flow to estimate accruals, rather than using changes in the balance sheet accounts to calculate total accruals. Collins and Hribar (2002) report that using a balance sheet approach to test for earnings management is potentially contaminated by measurement error in the accruals estimates.

seen in the working capital accounts, such as accounts receivable (Dechow and Dichev, 2002). Firms that have large gross accounts receivable are more likely to find it less costly to manage earnings because the change in the gross accounts receivable that would be expected in the future would be less noticeable. Therefore, to increase the possibility of detecting firms more likely to engage in channel stuffing,⁷ we use gross accounts receivable to total assets as our first selection criterion, and eliminate three industry groups with relatively low median and mean ratios: cement (7.99%; 7.77%), transportation (4.95%; 10.19%) and tourism (0.83%; 1.83%).⁸ Using this criterion, only about 4.39% of the total firm-year observations are excluded. In addition, our final sample had to meet the following criteria:

1. Firms had to have a December fiscal year-end. This is necessary to ensure that all firms have the same returns accumulation period to prevent possible error due to fiscal-year differences.
2. All banking or financial firms were excluded from the sample to avoid the distinct characteristics of financial institutions.
3. Firms had to have financial statements available to ensure the accessibility of financial data.
4. Firms had to have their data of annual stock returns available on the TEJ database to allow us to examine the relation between returns and reported earnings.

These selection criteria yielded a final sample consisting of 5,739 firm-year observations.

3.2 Selection of Channel-Stuffing (CS) Portfolio Suspects

Building on the work of Jackson and Wilcox (2000), we separate our sample firms into two portfolios. Those firms whose managers are likely to grant extended credit to increase reported earnings are placed in the channel stuffing (CS) portfolio or test portfolio. Those firms whose managers are not likely to engage in channel stuffing are placed in the non-channel stuffing (non-CS) portfolio, or the control portfolio. The control portfolio serves as a benchmark against which to compare the test portfolio.

In order to identify firms whose managers are likely to engage in channel stuffing, two steps are conducted.

The first step refers to a simple observation about the effects of channel stuffing (through extended credit) on the accounts receivable turnover rate and the inventory turnover rate.

⁷ Since earnings management is hard to detect, it is difficult to study how capital markets participants respond to revelations of earnings management in general. Consequently, studies in this area normally focus on extreme cases of earnings management that culminate in SEC enforcement action (see, e.g. DeFond and Jiambalvo, 1994). Previous studies generally assume that although earnings management is pervasive, most of the accrual models will not reject the null hypothesis of no earnings management unless the magnitude of the manipulation is sufficiently large.

⁸ The average median and mean values of the total observations are 24.60% and 17.34%, respectively.

$$\text{Accounts Receivable Turnover Rate (AR}_{tr}) = \frac{\text{Net sales}}{\text{Average gross accounts receivable}}$$

$$\text{Inventory Turnover Rate (Inv}_{tr}) = \frac{\text{Cost of goods sold}}{\text{Average inventories}}$$

As we are interested in whether managers grant extended credit at the year-end (the fourth quarter) to avoid reporting losses, AR_{tr} (Inv_{tr}) in the third quarter of the year serves as a benchmark for what accounts receivable turnover rate (or inventory turnover rate) would have been in the absence of unusual extended credit in the fourth quarter. AR_{tr} (Inv_{tr}) in the fourth quarter should decline (increase), relative to the turnover rate in the third quarter, if managers grant generous credit terms at the end of the fiscal year to induce customers to overbuy.

$$AR_A = AR_{tr} (\text{Quarter 3 of current year}) - AR_{tr} (\text{Quarter 4 of current year}). \quad (1)$$

$$Inv_A = Inv_{tr} (\text{Quarter 3 of current year}) - Inv_{tr} (\text{Quarter 4 of current year}). \quad (2)$$

Specifically, equations (1) and (2) refer to the change in gross accounts receivable turnover rate (AR_A) and the change in inventory turnover rate (Inv_A) between the third and fourth quarters of the year.⁹ If firms grant extended credit in the fourth quarter to induce customers to overbuy, then AR_A and Inv_A would be expected to be positive and negative, respectively.

In addition, since credit sale increases at the end of the fiscal year can be caused by the customary operating pattern of an industry, our second step in partitioning the sample into a CS portfolio and a non-CS portfolio requires a comparison of the firm-year AR_A (Inv_A) and the medians of AR_A (Inv_A) for each industry-year. We compute the medians of AR_A and Inv_A for each industry-year as additional standards against which to compare any unusual earnings manipulation. When managers induce customers to overbuy by granting extended credit at year-end, AR_A (Inv_A) is expected to be larger (smaller) than its median standard. Thus, AR_A (Inv_A) in the CS portfolio is not only required to be positive (negative), but also greater (smaller) than each industry-year's median.

3.3 Threshold Partition

The manipulation of earnings to meet thresholds in one period will affect earnings in the following period (Degeorge et al., 1999). In other words, current earnings are raised by “borrowing” from future earnings. Because of this “reversal effect”, we expect that if executives grant extended credit in one period, the effect will be more obvious in the following period.

Building on the work of Degeorge et al. (1999), we divide the CS and non-CS portfolios into four groups, according to their return on assets (ROA). ROA is calculated

⁹ To adjust for the effects of seasonality, we also adjust the measure of accounts receivable with the previous quarter's measure. The conclusions from both adjustments are the same.

as income before extraordinary items, divided by total assets at the beginning of the year. Group A consists of firms that have failed to meet the threshold, Group B consists of firms that have just met or just exceeded the threshold, Group C consists of firms that have easily surpassed the threshold and Group D includes firms that have greatly exceeded the threshold. To avoid the contamination of threshold effects, each group is assigned a 0.05 ROA range. Group B of the CS portfolio is likely to include a number of firms that engaged in earnings management to meet the threshold. Because the recorded earnings are suspected of upward manipulation, their ROA in the following period is expected to be lower than what it would have been in the absence of earnings management. In other words, the firms in Group B of the CS portfolio—which presumably borrowed earnings from the following period—should underperform firms in the group immediately above (Group C) and those immediately below (Group A) in the following period.

3.4 Probit Regression for Hypothesis One

We conduct a probit regression in order to determine whether managers grant extended credit to avoid reporting losses (Hypothesis 1). We also control for factors that might influence the occurrence of earnings management independent of channel stuffing.

$$CS_{it} = \beta_0 + \beta_1 ABOVE_{it} + \beta_2 BELOW_{it} + \beta_3 \Delta INV_A_{it} + \beta_4 \Delta LIQ_A_{it} + \beta_5 \Delta ASSET_{it} + \beta_6 LogMV_{it} + \beta_7 CFO_{it} + \varepsilon_{it} \quad (3)$$

Where

- i = firm index;
- t = year index for 1990–2003;
- CS_{it} = a dummy variable, which takes the value 1 if the firm is suspected of channel stuffing (belongs to the CS portfolio), and 0 otherwise;
- $ABOVE$ = a dummy variable, which takes the value 1 if the observation has an ROA in the interval between 0 (exclusive) and 0.05 (inclusive), and 0 otherwise; and
- $BELOW$ = a dummy variable, which takes the value 1 if the observation has an ROA in the interval between -0.05 (inclusive) and 0 (exclusive), and 0 otherwise.

The control variables are as follows:

- ΔINV_A_{it} = the change in inventory between the third and fourth quarters, divided by total assets at the beginning of the year;
- ΔLIQ_A_{it} = the change in working capital (excluding inventory) between the third and fourth quarters, divided by total assets at the beginning of the year;

- CFO = the cash flow from operations, divided by total assets at the end of the previous year, where cash flow from operations is taken from the statement of cash flow;
- $\Delta ASSET_{it}$ = the change in total assets from the end of the previous year to the end of the current year, divided by total assets at the end of the previous year; and
- $LogMV_{it}$ = the natural logarithm of the market value of common equity at the end of the current year.

In equation (3), *ABOVE* is the test variable and is expected to be positive because firms in the CS portfolio are expected to grant extended credit at the end of the fiscal year in order to meet their annual earnings objective (the threshold of zero). Further, we predict that the null hypothesis (*ABOVE* = *BELOW*) will be rejected because managers tend to avoid reporting losses and thus observations are more likely to be located in the interval just above zero than in the interval just below zero.

Because earnings management may be influenced by factors other than channel stuffing, we also control for such factors in estimating the regression. Building on Jackson and Wilcox (2000), ΔINV_A_{it} is included because firms that have inventory build-ups are more likely to offer extended credit at year-end to avoid spoilage and to reduce inventory holding costs. The coefficient for ΔINV_A_{it} is expected to be positive, because increases in inventory are more likely to trigger the granting of extended credit, independent of channel stuffing. The variable ΔLIQ_A_{it} is included because firms with liquidity problems are more likely to offer extended credit at year-end to convert their inventory to more liquid current assets. The coefficient for ΔLIQ_A_{it} is expected to be negative, because declines in liquidity are more likely to trigger the granting of extended credit, independent of channel stuffing.

We also include CFO_{it} as an indicator of a firm's normal operations. Prior studies (Cheng et al., 1996) suggest that the CFO_{it} can be an indicator of a firm's operations, because it is difficult to manipulate the CFO_{it} unless a firm intentionally frontloads or defers the recognition of cash accompanying revenue or expense. If the use of extended credit is not for the purpose of channel stuffing, but part of the normal operating decisions of a business, a decrease in the accounts receivable turnover rate and an increase in the inventory turnover rate can result from good operating decisions. Therefore, we expect the coefficient for CFO_{it} to be positive.

Finally, we use $\Delta ASSET_{it}$ to control for growth and $LogMV_{it}$ for firm size. Smaller and high-growth firms generally have better operating performance trends, and are less likely to engage in channel stuffing activities to boost reported earnings. Therefore, we expect the coefficients for $\Delta ASSET_{it}$ and $LogMV_{it}$ to be negative and positive, respectively.

3.5 The Effect of Granting Extended Credit on the Information Content of Reported Earnings

If channel stuffing is used to avoid reporting losses, we expect that the use of channel stuffing can reduce the information content of reported earnings.

The effect of channel stuffing (that is, granting extended credit to avoid reporting losses) on the estimated earnings response coefficient (ERC) and the information content of reported earnings (as measured by the adjusted R^2 of the return-earnings regression) is assessed through analysis of the following regression:

$$RET_{it} = \gamma_0 + \gamma_1 \Delta E_{it} + v_{it} \quad (4)$$

where RET_{it} is the annual stock returns of a sample firm i in year t (accumulated from $t/1/1$ to $t/12/31$)¹⁰; ΔE_{it} is the change in earnings in year t , and v_{it} is an error term. Change in earnings (ΔE_{it}) is scaled by the total market value of equity at the beginning of year t .¹¹

The regression is estimated for each group of the CS and non-CS portfolios and the results of the non-CS portfolio serve as a benchmark against which to compare the results of the CS portfolio. Because channel stuffing is likely to have a dampening effect on measures of the information content of reported earnings, in the estimation of equation (4) we predict that the adjusted R^2 for Group B firms in the CS portfolio will be smaller than those for the adjacent groups. Further, since channel stuffing results in an increase in earnings, the CS firms are expected to have a lower ERC in equation (4) than the non-CS firms. At the same time, if extended credit is granted as a means of channel stuffing, we expect the information content of reported earnings to reduce. Thus, in equation (4) the following relation between the regression parameters of the Group B firms in the CS and non-CS portfolios is expected to hold:

$$ERC_{cs} < ERC_{non-cs} \rightarrow \gamma_{1,cs} < \gamma_{1,non-cs}$$

3.6 Unexpected Accounts Receivable (UAR)

To provide additional evidence of earnings management, we use the unexpected accounts receivable (UAR) as a measure of channel stuffing.¹² We assume that accounts receivable is the primary accrual account managed in the channel stuffing activities in Taiwan.

¹⁰ We select the window to accumulate stock returns for examining the degree of correspondence that accounting earnings reflects the same information set which the stock return reflects.

¹¹ The market value of equity is used as the deflator because it includes market expectations for growth and inflation. Scaling by market value also avoids spurious correlations due to size and reduces the problem of heteroskedasticity (Christie, 1987).

¹² Like McNichols and Wilson (1988), we use narrower settings to model the particular component of accruals to mitigate the misclassification problem (the erroneous classification of nondiscretionary accruals as discretionary).

In accordance with Dechow et al. (2003) and Marquardt and Wiedman (2004), we develop measures for the portion of accounts receivable that is unexpected. These measures are intuitive and are drawn from the financial statement analysis literature. Unlike the modified Jones model, which assumes that all credit sales in each period are discretionary, we make an adjustment for the expected increase in credit sales (Dechow et al., 2003) and estimate the following regression for each industry-year grouping:¹³

$$\Delta AR_{it} = \alpha_{it} + k\Delta sales_{it} + \varepsilon_{it} \quad (5)$$

The slope coefficient (k) in equation (5) captures the expected change in gross accounts receivable for a given change in sales. The median (mean) value of the slope coefficient is 0.15 (0.12).¹⁴ On average, a \$100 change in sales results in a \$12 change in gross accounts receivable. Thus, the unexpected component is simply the difference between the actual account balance and this expected value (which is α plus k multiplied by the change in sales). We calculate firm-years with their unexpected accounts receivable that lie in the interval just below zero (i.e. ROA between -0.05 and 0) and in the interval just above zero (i.e. ROA between 0 and 0.05) and then conduct tests on the UAR across the two intervals and across the two portfolios. If firms grant extended credit to avoid reporting losses, then for the CS portfolio, the UAR in the interval just above zero is likely to be higher than the UAR in the interval just below zero. We use the Wilcoxon test and the t-test to examine this difference.

As the unexpected accounts receivable (UAR) may be able to serve as a measure of channel stuffing, we add the UAR to equation (4) to test the incremental information that may be provided by the UAR:

$$RET_{it} = \gamma_0 + \gamma_1\Delta E_{it} + \gamma_2UAR_{it} + \varepsilon_{it} \quad (6)$$

where the sign of the coefficient of UAR is expected to be negative.

4. Empirical Results

4.1 Descriptive Statistics

Panel A of Table 1 presents the descriptive statistics and the two-sample Wilcoxon rank-sum tests of differences for the CS and non-CS portfolios.

In Taiwan, channel stuffing is primarily achieved by granting extended credit, rather than by reducing prices. The CS firms have a higher level of accounts receivable (mean = 24.2%; median = 19.8%) and a lower allowance to receivables ratio (mean = 2.4%; median = 1.4%) than the non-CS firms.

¹³ We use the industry classification of the TEJ to identify industry groupings.

¹⁴ These numbers are about two times larger than those reported by Dechow et al. (2003). In addition, there are 27 (out of 252) instances in which the slope estimate is negative. These estimates are re-coded as zero.

Table 1
Descriptive Statistics for Key Financial Variables
Sample consists of 5,739 observations for 1990–2003

Panel A: Descriptive Statistics for Two Portfolios

Variables ^a	The CS Portfolio n = 753		The non-CS Portfolio n = 4,986		Z-statistics from the Wilcoxon two- sample test
	Mean	Median	Mean	Median	
ASSETS	8460.55	3313.37	10797.78	3891.70	
ROA	0.0620	0.0506	0.0492	0.0414	3.674***
ΔROA	0.015	0.0079	0.0065	0.0037	2.982***
AR	0.2424	0.1983	0.1763	0.1390	10.***
ALLOW_AR	0.0243	0.0136	0.0392	0.0174	-5.60***

Panel B: Descriptive Statistics for the Control Variables in the Profit Regression

Variables ^a	Mean	Std. Dev.	25%	50%	75%
ΔINV_A	0.0007	0.0475	-0.0120	-0.0004	0.0119
ΔLIQ_A	0.0126	0.1066	-0.0263	0.0049	0.0375
ΔASSET	0.1532	0.3100	-0.0069	0.0852	0.2310
LogMV	6.4692	0.5838	6.0685	6.4301	6.8045
CFO	0.0539	0.1254	0.0029	0.0526	0.1114

^a Variable definitions:

- ASSETS = total assets (in millions of dollars);
- ROA = income before extraordinary items, divided by total assets at the beginning of the year;
- ΔROA = current year’s income less previous year’s income before extraordinary items, divided by total assets at the end of the previous year;
- AR = net accounts receivable, divided by total assets at the beginning of the year;
- ALLOW_AR = year-end allowance for uncollectible accounts receivable, divided by year-end gross accounts receivable;
- ΔINV_A = change in inventory between quarters three and four, divided by total assets at the beginning of the year;
- ΔLIQ_A = change in working capital (excluding inventory) between quarters three and four, divided by total assets at the beginning of the year;
- ΔASSET = first difference in total assets, divided by total assets at the end of the previous year;
- LogMV = natural logarithm of the market value of common equity at the end of the current year;
- CFO = cash flow from operations, divided by total assets at the end of the previous year, where cash flow from operations is taken from the statement of cash flow.

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, for two-tailed test.

4.2 Univariate Tests of Earnings Distribution Around Zero

Our first set of tests examines whether the distribution of earnings around the zero threshold is smooth. We apply Burgstahler and Dichev’s (1997) primary analysis and calculate the standardized difference between the two intervals adjacent to zero for the CS and non-CS portfolios. The standardized difference of an interval is the difference between the observed and the expected number of observations in the interval, standardized by the estimated standard deviation of the difference.

We first examine histograms of return on assets (ROA), which is calculated as the current year’s income before extraordinary items, divided by total assets at the beginning of the year. We follow DeGeorge et al. (1999) and use a bin width of twice the inter-quartile range of the variable multiplied by the inverse of the cube root of the sample size (0.01). We consider ROA to be small if the absolute value is less than 0.05. We then divide ROA into two intervals: one that lies between -0.05 (inclusive) and 0 (exclusive) and the other that lies between 0 (exclusive) and 0.05 (inclusive). The interval size, which is five times the bin width used in the ROA histograms, results from a trade-off between sample size and the amount of feasible earnings management.¹⁵ If the intervals around zero are smooth, then the distribution of the standardized difference will be approximately normal, with a mean of zero and a standard deviation of one.

Table 2 displays the significance of irregularity around zero. As predicted, the CS firms show a greater frequency of small profits than expected (a standardized difference of 4.58). The result for the CS portfolio is stronger than that for the non-CS portfolio (standardized difference of 2.78). This increases our confidence that the number of firm-years in which small profits are reported is significantly greater than expected. This is further supported by the fact that we also find fewer instances of small losses reported than we would expect for firms in the CS portfolio (standardized difference of -3.90 , the smallest standardized difference across all CS portfolio bins).¹⁶

Table 2
Firm-Years with ROA in the Interval Just Below Zero and Just Above Zero for the Two Portfolios

(Total Observations)	Standardized Difference ^a	
	Interval Just Below Zero (ROA ^b between 0 and -0.05)	Interval Just Above Zero (ROA between 0 and 0.05)
The CS Portfolio ($n = 753$)	-3.90	4.58
The Non-CS Portfolio ($n = 4986$)	-2.89	2.78

^a The standardized difference is the difference between the observed and the expected number of firm-years in an interval, standardized by the estimated standard deviation of the difference.

^b ROA is current year’s income before extraordinary items, divided by total assets at the beginning of the year.

4.3 Probit Tests

We examine our first hypothesis (i.e. whether managers tend to use extended credit to avoid reporting losses) using a multivariate probit analysis. If the observation has ROA in the range of $(0, 0.05)$, the sample firm is expected to engage in channel stuffing

¹⁵ Another reason for this interval size is that the potential cost of using channel stuffing may be high, and managers may require a greater manipulation result based on the theory of costs and benefits (Marquardt and Wiedman, 2004). The expected number of observations in each interval is the average of the number of observations in the two immediately adjacent intervals. We calculate the standard deviation of the standardized difference using the entire distribution of ROA.

¹⁶ It would be inappropriate to interpret the standardized difference as a t-statistic for determining significance because the distributions of earnings are not smooth; that is, the assumption that earnings are normally distributed is rejected at the 0.01 level of confidence for both the CS and non-CS portfolios. The assumption of a smooth distribution is more reasonable for Burgstahler and Dichev (1997) because their sample was much larger than ours.

to avoid losses and the dummy variable $ABOVE_{it}$ takes the value of 1. On the other hand, if the observation has ROA in the range of $(-0.05, 0)$, the sample firm is expected not to engage in channel stuffing and the dummy variable $BELOW_{it}$ takes the value of 1.

We control for ΔINV_A_{it} , ΔLIQ_A_{it} , CFO_{it} , $\Delta ASSET_{it}$ and $LogMV_{it}$ as these are related to factors other than channel stuffing that can give rise to a decrease in the accounts receivable turnover rate and an increase in the inventory turnover rate.

Table 3
Probit Model of Earnings Management for Firms that Avoid Reporting Losses

$$CS_{it} = \beta_0 + \beta_1 ABOVE_{it} + \beta_2 BELOW_{it} + \beta_3 \Delta INV_A_{it} + \beta_4 \Delta LIQ_A_{it} + \beta_5 \Delta ASSET_{it} + \beta_6 LogMV_{it} + \beta_7 CFO_{it} + \epsilon_{it} \tag{3}$$

Panel A: Regression Summary Statistics

Variables ^a	Exp. Sign	Coeff.	p-value ^c	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept ^b	?	1.1508	<.0001	1.1446	<.0001	0.8884	0.0003	0.8808	0.0004
<i>ABOVE</i>	+	0.1363	0.0142	0.1425	0.0111	0.1187	0.0363	0.1243	0.0302
<i>BELOW</i>	-			0.0740	0.3969			0.0579	0.5143
ΔINV_A	+	6.6624	<.0001	6.6685	<.0001	7.3747	<.0001	7.3723	<.0001
ΔLIQ_A	-	-0.6378	0.0017	-0.6303	0.0019	-0.3697	0.0646	-0.3673	0.0664
$\Delta ASSET$	-					-0.4431	<.0001	-0.4382	<.0001
<i>LogMV</i>	+					0.0443	0.2479	0.0445	0.2456
<i>CFO</i>	+					0.9587	<.0001	0.9683	<.0001

Panel B: Tests of Coefficient Restrictions

Restriction	χ^2	p-value	χ^2	p-value	χ^2	p-value	χ^2	p-value
All equal	171.13	<.0001	171.95	<.0001	231.08	<.0001	231.76	<.0001
<i>ABOVE</i> = <i>BELOW</i>			6.74	0.0175			4.81	0.0452

^a Variable definitions:

- CS* = dummy variable, taking the value 1 for the firms in the CS portfolio, and 0 otherwise;
- ABOVE* = dummy variable, taking the value 1 if the observation has ROA in the interval between 0 exclusive and 0.03 inclusive, and 0 otherwise;
- BELOW* = dummy variable, taking the value 1 if the observation has ROA in the interval between -0.03 and 0 exclusive, and 0 otherwise;
- ΔINV_A = change in inventory between quarters three and four, divided by total assets at the beginning of the year;
- ΔLIQ_A = change in working capital (excluding inventory) between quarters three and four, divided by total assets at the beginning of the year;
- $\Delta ASSET$ = first difference in total assets, divided by total assets at the end of the previous year;
- LogMV* = natural logarithm of market value of common equity at the end of the current year; and
- CFO* = cash flow from operations, divided by total assets at the end of the previous year, where cash flow from operations taken from the statement of cash flow.

^b We also exclude the intercept to test the regressions, and the results are similar.

^c p-values for the test of the restriction *ABOVE* = *BELOW* are one-sided; all others are two-sided.

Panel A of Table 3 shows the probit regression results for the four specifications of equation (3) that are relevant to testing hypothesis 1: (i) including the intercepts, the

earnings distribution indicator variable $ABOVE_{it}$, and the control variables ΔINV_A_{it} and ΔLIQ_A_{it} ; (ii) the same as (i) but with the addition of another position variable $BELOW_{it}$; (iii) the same as (i) but with the addition of other control variables CFO_{it} , $\Delta ASSET_{it}$ and $LogMV_{it}$; and (iv) the full model of equation (3).

In the first specification, the probit estimate of $ABOVE_{it}$ is significantly positive at the 5% level, indicating that firms tend to use the extended credit to avoid reporting losses. The results are similar when we control for those factors that might influence the occurrence of earnings management independent of channel stuffing. The control variables are generally significant in the predicted direction, and the test variable, $ABOVE_{it}$, is significant ($p < 0.05$) in all specifications of equation (3).

Specifically, the results from the estimation of the fourth specification indicate that channel stuffing occurs in the region immediately above zero, and insignificantly occurs in the region immediately below zero. The coefficient for $ABOVE_{it}$ (0.1243) is significantly positive, but the coefficient for $BELOW_{it}$ is insignificant. Moreover, the coefficient for ΔINV_A_{it} is significantly positive, suggesting that firms that have inventory build-ups are more likely to offer extended credit at year-end to avoid spoilage and to reduce inventory holding costs. The coefficient for ΔLIQ_A_{it} is significantly negative as declines in liquidity are more likely to trigger the granting of extended credit, independent of channel stuffing.

To provide further evidence that managers use extended credit to avoid reporting losses, Panel B reports the results for the null hypothesis ($ABOVE = BELOW$). The results formally reject the null hypothesis at the 0.05 level of confidence.¹⁷ Thus, the results reinforce our first hypothesis that managers grant extended credit at the end of the fiscal year to avoid reporting losses.

4.4 The Relative Performance of the CS-Portfolio and Non-CS Portfolio in the Subsequent Year

Our second hypothesis relates to the issue of whether the practice of channel stuffing reduces the information content of earnings because of the “reversal effect”. As the manipulation of earnings to meet thresholds in one period will affect earnings in the following period (Degeorge et al., 1999), we expect that the potential cost of using channel stuffing to avoid reporting losses will be reflected in the performance of the following year.

Panel A (Panel B) of Table 4 presents the mean and median of the relative performance of the CS portfolio (non-CS portfolio) in the year subsequent to the formation of the portfolio. Following Degeorge et al. (1999), we divide our sample into four groups according to their ROA. Group A consists of firms that have failed to meet the threshold, Group B consists of firms that have just met or just exceeded the threshold, Group C consists of firms that have easily surpassed the threshold and Group D includes firms that have greatly exceeded the threshold.

¹⁷ The estimation of the fourth specification of equation (3) yields similar results.

Table 4
The Relative Performance (ΔROA) of Groups for the Year following the Formation of the Groups

Panel A: The CS Portfolio

	Groups by Performance in Formation Year			
	A. Miss Threshold -5 to -1	B. Meet Threshold +1 to +5	C. Surpass Threshold +6 to +10	D. Strongly Surpass Threshold +11 to +15
No. of observations	62	184	158	63
Performance in following year:				
1. Mean ΔROA ^a	0.0084	-0.0061	0.0010	0.0107
2. Median ΔROA	0.0109	-0.0007	0.0016	0.0095
3. Wilcoxon test ^b	1.5013	0.6928	1.5951	N.A. ^c
p-values	<.0001	<.0001	<.0001	

Panel B: The Non-CS Portfolio

	Groups by Performance in Formation Year			
	A. Miss Threshold -5 to -1	B. Meet Threshold +1 to +5	C. Surpass Threshold +6 to +10	D. Strongly Surpass Threshold +11 to +15
No. of observations	497	1394	970	457
Performance in following year:				
1. Mean ΔROA ^a	0.0088	-0.0028	-0.0052	-0.0041
2. Median ΔROA	0.0155	0.0005	-0.0017	-0.0022
3. Wilcoxon test ^b	6.4178	-0.6106	0.0411	N.A. ^c
p-values	<.0001	0.5415	0.9672	

^a ΔROA = current year's income before extraordinary items less previous year's income before extraordinary items, divided by total assets at the end of the previous year.

^b The Wilcoxon test compares a group's performance in the post-formation year with that of an adjacent group. Under the null hypothesis that the distributions of performance of the two groups being compared are the same, the Wilcoxon test is normally distributed $N(0,1)$. We also test the differences between group means using t-tests; the results are similar.

^c N.A. = not applicable.

The salient comparisons are between Group B and its adjacent groups. In the CS portfolio, the U-shaped pattern reveals that firms in the B group were outperformed by both Group A and Group C firms. Consistent with our expectations, the mean and median $\Delta ROAs$ for Group B firms are lower than those for Group A and Group C firms. It is not surprising that Group C firms outperform the firms in Group B since Group C firms performed better in the current period and we would expect this to continue both in earnings level and in change in earnings. What is significant is that Group A firms outperformed Group B firms, presumably because of strong earnings management in Group B firms.

Panel B of Table 4 presents the results for the non-CS portfolio. Consistent with DeGeorge et al. (1999), the U-shaped pattern does not appear in the non-CS portfolio. While the result shows that group B significantly underperforms group A, the lack of

a significant difference between the meet and surpass groups B and C suggests that evidence of borrowing future earnings is less conclusive in the non-CS portfolio than in the CS portfolio. This finding indirectly confirms our expectation that when executives grant extended credit to avoid reporting losses, the effect is seen most clearly in the following period because of the reversal effect.

4.5 The Effect of Earnings Management on the Information Content of Reported Earnings

To test the information content of reported earnings, we regress contemporaneous returns on change in earnings for each group,¹⁸ and we compare the effects across the four threshold groups (ABCD) from the CS and non-CS portfolios, respectively.

Table 5 reports the earnings response coefficients (ERC) and R^2 in equation (4).¹⁹ Consistent with our hypothesis 2, we find that the use of extended credit to avoid reporting losses reduces the information content of earnings. The adjusted R^2 (4.28%) for Group B firms in the CS portfolio is clearly smaller than that (12.98%) for Group B firms in the non-CS portfolio. Also, the coefficient for change in earnings is smaller for Group B firms in the CS portfolio (0.84, with $p < 0.01$) as compared to that for Group B firms in the non-CS portfolio (1.31, with $p < 0.01$). This suggests that ΔE is less informative for Group B firms in the CS portfolio than for those in the non-CS portfolio.

Table 5
Regression Results of Returns on Level of Earnings and Change in Earnings

		$RET_{it} = \gamma_0 + \gamma_1 \Delta E_{it} + v_{it}$ (4)						
		The CS Portfolio			The Non-CS Portfolio			
		n	γ_1 (t -statistic)	Adj. R^2 (%)	n	γ_1 (t -statistic)	Adj. R^2 (%)	
A.	Miss Threshold -5 to -1	64	0.76 ** (2.0398)	6.20	545	0.87 *** (10.914)	17.81	
B.	Meet Threshold +1 to +5	205	0.84 *** (3.1867)	4.28	1522	1.31 *** (15.098)	12.98	
C.	Surpass Threshold +6 to +10	153	1.24 *** (5.2434)	14.76	973	0.97 *** (13.068)	14.86	
D.	Strongly Surpass Threshold +11 to +15	62	3.68 *** (2.8520)	10.32	435	2.87 *** (11.730)	23.90	

Variable definitions:

RET = annual stock returns of a sample firm in year t (accumulated from $t/1/1$ to $t/12/31$);

ΔE = change in earnings divided by the firm's total market value of equity at the beginning of year t .

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed t-test.

¹⁸ We also decompose earnings into CFO and total accruals and rerun the return-earnings regression. We find that the association between stock returns and CFO plus accruals is not appreciably greater than for stock returns and earnings. This result is consistent with the finding of Lev and Zarowin (1999), and reveals that earnings appear to be a superior summary measure of firm performance.

¹⁹ We changed each group's ROA range to 0.03 and repeated the analyses, but this had no significant effect on the results.

4.6 *The Information Content of Unexpected Accounts Receivable for Channel Stuffing*

To determine whether the UAR can provide incremental information conditioned on earnings for Group B firms in the CS portfolio, we look at the results of equation (6) as shown in Table 6. Compared to the results of equation (4) in Table 5, the adjusted R^2 for Group B firms in the CS portfolio increases after adding the UAR variable into equation (4), while the adjusted R^2 for Group B firms in the non-CS portfolio does not. Specifically the adjusted R^2 dramatically increases from 4.28% in equation (4) to 13.10% in equation (6) for Group B firms in the CS portfolio. The coefficient for UAR in equation (6) is 0.68, at the 1% significance, but with an unexpected sign. However, for the non-CS portfolio, the coefficient for UAR is insignificant. These findings indicate that the UAR cannot provide incremental information over earnings. Thus, the results do not support our third hypothesis.

Table 6
Regression Results for the Incremental Information Content of UAR

$$RET_{it} = \gamma_0 + \gamma_1 \Delta E_{it} + \gamma_2 UAR_{it} + v_{it} \tag{6}$$

		The CS Portfolio				The Non-CS Portfolio			
		<i>n</i>	γ_1 (t-statistic)	γ_2 (t-statistic)	Adj. R^2	<i>n</i>	γ_1 (t-statistic)	γ_2 (t-statistic)	Adj. R^2
A.	Miss Threshold -5 to -1	64	0.94 *** (2.9062)	2.33 *** (4.7947)	29.36	545	0.87 *** (11.0082)	0.35 * (1.7749)	18.14
B.	Meet Threshold +1 to +5	205	0.83 *** (3.3103)	0.68 *** (4.6589)	13.10	1522	1.31 *** (15.13)	0.08 (1.0985)	12.99
C.	Surpass Threshold +6 to +10	153	0.85 ** (2.0841)	0.34 (1.1762)	14.98	973	0.97 *** (12.9215)	0.06 (0.3954)	14.78
D.	Strongly Surpass Threshold +11 to +15	62	3.56 ** (2.5215)	0.29 (0.2133)	8.89	435	2.86 *** (11.2732)	0.03 (0.1488)	23.73

Variable definitions:

RET = annual stock returns of a sample firm in year t (accumulated from $t/1/1$ to $t/12/31$);

ΔE = change in earnings divided by the firm's total market value of equity at the beginning of year t ;

UAR = unexpected accounts receivable, which is estimated from equations (4) and (5).

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed t-test.

5. Conclusion

The volume of research concerning channel stuffing as practiced by firms listed on NASDAQ or the New York or American Stock Exchanges is extensive. However, comparatively little is known about the extent and practice of earnings management by other firms. This study is concerned with channel stuffing as practiced in Taiwan. Further, this research focuses on the operating decisions involved in channel stuffing as opposed to the accounting aspects. Therefore, we believe that this study makes a unique contribution to the body of literature concerning earnings management.

Similar to Jackson and Wilcox (2000), we investigated whether managers grant extended credit at the end of the fiscal year to avoid reporting losses. Further, we studied the effects of channel stuffing on the information content of reported earnings and we sought to determine whether the unexpected accounts receivable (UAR) can provide incremental information about channel stuffing.

Consistent with our hypotheses, we found that managers of Taiwan-listed firms do grant extended credit to avoid reporting losses and that these unusually generous credit terms (channel stuffing) negatively impact the earnings information provided to investors. Finally, we found that the unexpected accounts receivable (UAR) cannot provide incremental information about channel stuffing.

Managers use channel stuffing as one technique to avoid reporting losses. Although it helps firms meet their short-term reporting objectives, it may be harmful in the long run. Earnings manipulation also reduces the information content of reported earnings and this may be harmful to investors who tend to rely on this measurement when making investment decisions. Although this practice does not technically violate GAAP, it is ethically questionable and it can contribute to accounting fraud. As noted by Doyle (2003, 128), “Channel stuffing is almost universally bad and almost always winds up disgracing the company that practices it.” As more information becomes available, it is hoped that adequate standards can be established which will limit the amount of earnings manipulation that managers can engage in. This, in turn, will help ensure the accuracy of earnings information available to investors. Finally, when these standards are put into place, it is anticipated that firms such as Bausch and Lomb, Bristol-Myers, Apple and Lucent Technologies will no longer be subject to censor by the SEC and tragedies such as Coretronic Corp and Procomp Informatics Ltd in Taiwan can be avoided.

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