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# 10b5-1 Plans and Earnings Management by High-Level Executives

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**Abstract**

Using historical firm financial and insider trading information, this paper examines whether high-level insiders manipulate earnings ahead of their own 10b5-1 equity transactions. The empirical evidence suggests that high-level executives appear to manipulate earnings through real activities such as abnormal discretionary expenditures and abnormal cash flows from operations to influence equity prices ahead of their own transactions under Rule 10b5-1. Evidence also suggests that executives appear to be unlikely to engage in earnings management through highly scrutinized means such as accruals. An interpretation of these results is that high-level executives may be using 10b5-1 plans as an offensive tool to trade with the knowledge of inside information, which appears to be in direct opposition to the defensive mechanism that 10b5-1 plans are intended to represent.

## I. Introduction

Insider trading and information-advantageous trades have long been a concern of the United States Securities and Exchange Commission (SEC). The SEC details explicit restrictions for trading securities on a U.S. regulated exchange.[1] Rule 10b-5 prohibits deceit or fraud in the course of a security purchase or sale. A company executive in possession of non-public information, who made a sale of relevant securities, would thus be in violation of insider trading restrictions. Hence, a company insider would typically not be able to trade this equity due to the possession of material nonpublic information.[2] In order to regulate insider trading on the basis of this material nonpublic information, the SEC adopted provision 10b5-1.[3] A 10b5-1 plan is a method for company executives, officers, managers, large shareholders, or other insiders to trade equity in that company without violating insider trading restrictions.[4] Rule 10b5-1 was created as a safe haven against said restrictions.

This rule allows an insider to sell shares as long as a certain condition is met. Specifically, the seller of equity must either specify the amount, price, and specific date of purchase or sale; or include a formula for determining a specific amount, price, and date of purchase or sale or give a broker the sole authority to determine if, when, and how trades are executed and said broker may not be in the possession of any material

[1] See Code of Federal Regulations Title 17 § 240.10b-5
[2] Title 17 Part 240 of the CFR has banned insider trading on the basis of material nonpublic information
[3] See Code of Federal Regulations Title 17 § 240.10b5-1
[4] Rule 10b-5 and the establishment of 10b5-1 trading plans can be found in the Code of Federal Regulations Title 17 § 240.10b-5

nonpublic information.[5] This makes implementing a 10b5-1 plan a rather simple strategy for someone with the economic resources to do so. These conditions are not restrictive, and clearly leave ambiguity as to the scope of trade execution. Arguably, these limited restrictions and regulations of such plans put participants more on the offensive than the defensive, contrary to the intention of this rule. The Director of Enforcement for the SEC has previously stated that recent academic research shows potential abuse of Rule 10b5-1. She also claims that the possibility has been raised that Rule 10b5-1 plans are being used to facilitate insider trading on the basis of nonpublic information.[6]

Prior research strongly suggests that company managers appear to have no problem using questionable strategies to give themselves and their employees an advantage. In particular, Aboody and Kasznik (2000) find that Chief Executive Officers (CEOs) manage the timing of voluntary disclosures and news around the timing of option awards in order to maximize potential profit. This same tendency is found by Daines et al. (2014) in an analysis of pre-option grant behavior by lead executives. CEOs are shown to have the tendency to release or create bad news pre-grant and delay the timing of positive news until after award grants.

This asymmetric information-advantageous behavior is not only limited to option awards. Similar phenomena are observed in equity markets. Specifically, Piotroski and Roulstone (2004) use data that predates the implementation of Rule 10b5-1 to show that insider purchases are related to future earnings performance, market-to-book ratios, and

[5] See Code of Federal Regulations Title 17 § 240.10b-5

[6] Speech by the SEC staff, Remarks at the 2007 Corporate Council Institute by Linda Chatman Thomsen Director, Division of Enforcement U.S. Securities and Exchange Commission Washington, D.C. March 8, 2007

past returns. They infer that insiders are thus trading on the basis of private financial account knowledge. Additionally, Jiang and Zaman (2007) find that insider trades are predominately due to strategic managerial timing. Furthermore, Beneish et al. (2004) examine data from 1983-1997, which predates Rule 10b5-1, and find evidence that managers scale earnings upwards after sales to reduce potential litigation risks.

Jagolinzer (2008) analyzes insider trading data and finds participants in 10b5-1 plans who sell equity generate abnormal trade returns, permitting strategic trades to occur. However, Jagolinzer (2008) does not answer the question of how these abnormal trade returns are generated. Robbins (2008) suggests that insiders use 10b5-1 plans to effectively trade on insider information by establishing plans to sell and then cancelling them if they become aware of material nonpublic positive news. This strategy is allowed to prevail because cancelling a 10b5-1 plan is not a violation of insider trading laws due to the fact that a trade must execute for insider trading to have occurred.[7] Additionally, Robbins (2008) finds that insiders strategically announce 10b5-1 plan trades in order to further profit from equity market adjustments. In line with these findings, Henderson et al. (2012) find that insiders voluntarily disclose 10b5-1 plan information to increase their strategic trade returns.

Following these findings, Shon and Veliotis (2013) determine how insiders are able to generate above average abnormal trade returns for 10b5-1 plan trade executions. Building on Jagolinzer (2008), Shon and Veliotis (2013) determine that insiders are able

[7] The SEC and Supreme Court has clarified this at Final Rule: Selective Disclosure and Insider Trading. SECURITIES AND EXCHANGE COMMISSION. 17 CFR Parts 240, 243, and 249. Release Nos. 33-7881, 34-43154, IC-24599, File No. S7-31-99. RIN 3235-AH82. Selective Disclosure and Insider Trading

to achieve abnormal above average trade returns by meeting or beating analysts' earnings expectations. Shon and Veliotis (2013) briefly mention that they control for accruals and that the respective control variable is significant in each regression. Shon and Veliotis (2013) note that this suggests accruals play a role in the likelihood of meeting or beating expectations. Skaife et al. (2012) also investigate the significance of financial accounts on insider trading. Skaife et al. (2012) find that firms reporting ineffective internal control over financial reporting experience more profitable insider trades. This suggests that financial reporting and financial accounts deserve more scrutiny when it comes to the investigation of abnormal insider trade profits.

It follows that company executives with 10b5-1 plans in place could control potential profits on equity moves by accrual manipulation or with further discretionary earnings management. The purpose of this study is to expand on prior research and to determine how participants in 10b5-1 plans generate above average returns, specifically at the executive level. Prior research that suggests accruals may play a role in earnings management ahead of 10b5-1 transactions. I examine this suggestion as well as analyzing further methods of earnings management that may typically be less obvious than accrual management. I posit that managers may be inclined to manipulate accounts that are less scrutinized than accruals. I analyze 10b5-1 plan sales and purchases juxtaposed with corresponding accrual management and discretionary earnings management to determine the cause of abnormally large trade returns under the 10b5-1 program. In particular, I compare 10b5-1 sell or purchase transactions with previous quarter performance matched accruals, abnormal cash flows from operations, abnormal discretionary expenditures, and abnormal productions. These aspects of a firm's financial statements have not been

previously analyzed as the underlying causes of excess 10b5-1 plan trade returns, and I posit that they are the main cause of said phenomena. Furthermore, I expand on prior research by analyzing whether impending 10b5-1 plan transactions cause firms to barely beat analysts' earnings expectations in the quarters preceding these transactions while subsequently determining the driving forces behind these microscopic earnings surprises. Note that equity transactions taking place in one quarter (t) are able to influence earnings management actions in the previous quarter (t-1) due to the fact that the transaction were in place and analyzed during multiple previous quarters (t-2, t-3, t-4, etc…). For example, if a 10b5-1 transaction is planned for Q4 of 2012, then this transaction will be known about by the insider and any portfolio managers in Q1, Q2, and Q3 of 2012, and likely parts of fiscal 2011, as well. This knowledge during the quarters preceding the trade allows an insider to manipulate financial accounts in the quarter directly preceding the 10b5-1 plan equity transaction.

I find suggestive evidence that the occurrence of a 10b5-1 plan transaction results in the presence of abnormal earnings management in the prior fiscal quarter to the transaction. Specifically, I find that high-level insiders appear to strategically manipulate abnormal discretionary expenditures and abnormal cash flows from operations ahead of their own 10b5-1 purchases or sales. Additionally, I find that the occurrence of a 10b5-1 plan transaction appears to strongly influences a firm's likelihood of having a small earnings surprise, and that this likelihood of surprise is driven by the 10b5-1 transaction and the subsequent earnings management that arises. These results suggest that 10b5-1 plans may be used as an offensive strategy by high-level executives in order to reap abnormally high trade profits, contrary to the legal intentions of Rule 10b5-1.

In the following section, I discuss the data. In Section III, I present the empirical strategy and results. Section IV provides conclusion.

## II. Data

I use data from Thomson Reuters, CRSP, Compustat, and I/B/E/S to create a unique data set of 10b5-1 transactions combined with historical financial data for 4,837 U.S. publicly traded companies between 2008 and 2013. Specifically, the data for 10b5-1 plan transactions is obtained from Thomson Reuters and is comprised of only equity transactions disclosed on SEC Form 3, 4, 5, or 144. All transactions occur at the CEO or CFO level. Table 1 lists definitions for all relevant variables.

There are 53,809 firm-quarter observations for historical firm data, during which 3,358 firm quarters had equity purchases occur, 9,710 firm quarters had equity sales occur, and 40,741 firm quarters had no equity purchases or equity sales occur. As in prior research (Shon and Veliotis (2013)) 258 periods that contain both equity purchases and equity sales are dropped from the final data. Instances where C-suite executives make both equity purchases and sales of the same equity in the same firm quarter are dropped because the directional sign of earnings management in regression analysis is irrelevant if both purchases and sales occur at the same level. These occurrences make up less than 0.5% of the data. I create a binary variable called *Dummysales,* which is equal to 1 if there is a 10b5-1 sale by a C-suite executive in the given quarter, and is equal to 0 if a 10b5-1 sale does not occur. I also create a binary variable called *Dummypurchases*, which is equal to 1 if there is a 10b5-1 purchase by a C-suite executive in the given quarter, and is equal to 0 if a 10b5-1 purchase does not occur. Note that *Dummysales* and *Dummypurchases* cannot both equal 1 in the same quarter, these occurrences have been dropped, as previously stated. *Dummysales* and *Dummypurchases* can both equal 0 in the same period. This would indicate that no 10b5-1 transaction (sale or purchase) took

place. Table 2 shows relevant 10b5-1 information and summary statistics. There are 2.9 times as many observations for equity sales as compared to equity purchases by insiders under 10b5-1 transactions. Occurrences of insider sales are more prevalent than purchases because an insider is more likely to sell equity in their firm to diversify, as opposed to purchasing more equity in their own firm to further concentrate a position. The average value of firm equity purchases in a given quarter is 0.074% of the firm's market capitalization, while the average value of equity sales per firm in a given quarter is 0.18%. A one standard deviation change in the level of firm purchases is equal to 0.18% of firm market capitalization while a one standard deviation change in the level of firm sales is equal to 0.31% of firm market capitalization. The largest equity purchase is 1.21% of market capitalization, the largest equity sale was 1.97% of market capitalization, while the smallest transactions for both sides of the trade were negligible and close to 0% of market capitalization. Note that all variables obtained are winsorized at the 1st and 99th percentiles.[8]

Historical financial data from quarterly filings is obtained from Compustat and CRSP mergers. Instances of duplicate or missing information based on a unique firm level identifier that is cross-referenced with 10b5-1 plan data are dropped from the data set. Quarterly financial data is used to determine performance matched abnormal accruals and discretionary earnings management, as well as for determining firm and industry specific control variables. Firm historical financial data variables are defined as follows. Refer to Table 1 for definitions of all variables mentioned. Earnings surprise is measured

[8] This action converts outliers below the 1st percentile to the 1st percentile and outliers above the 99th percentile to the 99th percentile.[8] This controls for extreme deviations in the data.

as the difference between the firm's actual earnings and the mean of analysts' expectations, divided by the equity price per share (controlling for firm size). I create a binary variable for a small surprise that equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 0.0 cents but less than 0.5 cents and 0 otherwise. I also consider two alternative small surprise indicators variables to ensure my results are not driven by how this variable is defined. The first equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 0.5 cents but less than 1.0 cents and 0 otherwise while the second equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 1.0 cents but less than 1.5 cents and 0 otherwise.

I also consider these additional historical firm financial data variables: the log of the market capitalization of the firm, the debt to asset ratio of the firm, the excess return of the firm which is measured as the compounded three month return percentage over the S&P500 index for each firm, the share turnover which is measured as the volume of shares exchanged in an aggregate over the firms total outstanding float, and market to book which is measured as the ratio of the firm's total market capitalization divided by the firm's total book value. Measures of discretionary earnings management consist of abnormal cash flows from operations, abnormal discretionary expenditures, abnormal production levels, and abnormal performance matched accruals. Firm industry is controlled for at the two-digit Standard Industrial Classification (SIC) code. The two-digit SIC code identifies firms based on their major group type, as defined by the Federal Government.

Additionally, coinciding with historical firm performance financial information, relevant historical analyst expectations at the firm level are collected from I/B/E/S and include a measure of the mean level of analyst expectations for a firm's earnings per share. Summary statistics for relevant firm historical financial information is presented in Table 2. Historical data representing overall U.S. stock performance and volatility, monthly Standard & Poor's 500 (S&P500) and monthly Volatility S&P500 (VIX) values, are obtained from CRSP and the Chicago Board of Options Exchange historical data. In the analysis, I control for the level of the VIX index, as well as the month over month return of the S&P500 index. Summary statistics for both of these indices are presented in Table 2. It can be seen that the S&P500 has increased linearly over the five-year observation period, with small downwards corrections in mid 2010 and mid 2011. The VIX index reached a period low of 13.45 and a high level of 44.14. The size of a one standard deviation move in the VIX index is equal to 8.96 and the average level is 23.84. I present correlations and pairwise correlations for all variables in Table 3 and Table 4, respectively. Correlations between measures of earnings management and measures of small earnings surprises are all statistically significant at or below the 5% level. The same holds true for the relationship between the occurrence of a 10b5-1 transaction and measures of earnings management. Further analysis will determine if these relationships hold true when controls are included in the regression models.

Accrual management is calculated by estimating abnormal accruals pursuant to the modified Jones model (1991). Firms are separated by industry at the 2-digit SIC code. If an industry has less than 10 observations for any given time period, it is dropped from the upcoming regression model. The modified Jones model (1991) is used to estimate

abnormal discretionary accruals from industry level accruals and controls for the level of inverse firm assets, property plant and equipment (PPE), and change in sales. After estimating abnormal accruals through the Jones mode (1991), abnormal accruals are adjusted pursuant to the model developed by Kothari et al. (2005). This model calculates performance-matched abnormal accruals by controlling for return on assets (ROA) in the abnormal accrual estimation regression model. This strategy is implemented to control for the effect of firm specific performance, measured by ROA, on discretionary accruals. Specifically, the performance-matched accrual calculation subtracts the abnormal jones model accruals of the firm in the quarter with the closest -matched ROA.

The remaining relevant measures of earnings management are abnormal cash flows from operations, abnormal production, and abnormal discretionary expenditures. Abnormal denotes variable deviations from the industry average. Cash flows from operations represent CFOs as per firm financial statements. Discretionary expenditures are the sum of advertising, research and development, and selling, general, and administrative expenses. Abnormal production is the sum of cost of goods sold (COGS) and changes in inventory during the quarter. Note that measures of abnormal earnings management are scaled by the level of total firm assets. These variables are estimated according to the Roychowdhury model (2006). Roychowdhury (2006) finds that in additional to abnormal accruals, managers also manipulate earnings through real activities. He asserts that managers have a tendency to manipulate cash flows from operations upwards to produce better net income numbers, to overproduce in order to reduce COGS to report higher margins, or to lower discretionary expenditures in order to report improved net income numbers.

In order to determine abnormal measures of earnings management, I follow Roychowdhury (2006) and estimate the subsequent model:

$$y_t = \alpha + \beta_1 X_t + \varepsilon_t \quad (1)$$

where y is a measure of firm level financials (cash flows from operations, production levels, or discretionary expenditures*)*, X is a vector of control variables that capture the tendency to engage in the manipulation of cash flows from operations, production levels, or discretionary expenditures (the inverse of assets, property plan and equipment (PPE) or sales over assets, and the change in sales over assets), t indicates time, and ε is an error term with the usual properties. For variable definitions please see Table 1. By controlling for the firm level at the two-digit SIC code in this regression, I am able to predict the regression model errors, thus generating the industry level measure of abnormal cash flows from operations, abnormal production levels, abnormal discretionary expenditures, and abnormal performance matched accruals. These measures of earnings management are all scaled by percentage of firm total asset level.

Table 7 presents the mean level of earnings management by 10b5-1 sales and purchases in the following quarter, respectively. As predicted, I find numerous statistically significant relationships between 10b5-1 sales (purchases) and measures of earnings management. The remainder of the paper formally analyzes these relationships between high-level executive 10b5-1 transactions and earnings manipulation.

## III. Empirical Strategy and Results

As previously stated, the purpose of this analysis is to determine if insiders who participate in 10b5-1 Plan transactions manipulate earnings in the quarter prior to the transaction being executed. I posit that insiders manage earnings through accrual management, cash flow from operations management, production management, or discretionary expenditure management. Additionally, I posit that high level executive 10b5-1 plan transactions lead to a greater likelihood of a firm experiencing a small earning's surprise (in relation to analyst estimates) and that this surprise is likely driven through active earnings manipulation. In order to test this, I estimate a model of the following form:

$$y_{t-1} = \alpha + \beta_1 DummyTrans_t + \beta_2 X_{t-1} + \zeta_t + \varepsilon_t \quad (2)$$

where y is a measure of earnings management (abnormal performance matched accruals, abnormal cash flows from operations, abnormal production, or abnormal discretionary expenditures), *DummyTrans* is an indicator variable equal to 1 if there is a 10b5-1 sale (purchase) by a C-suite executive in the given quarter, and is equal to 0 otherwise (depending on the specification), X is a vector of control variables that capture the tendency to implement a 10b5-1 Plan transaction or the tendency to engage in the manipulation of earnings (S&P 500 volatility index level, month over month return of the S&P500, the log of firm market capitalization, debt to asset ratio, the excess return of firm equity, market to book ratio, and two digit industry classification), zeta controls for time fixed effects, t indicates quarter, and ε is an error term with the usual properties. In all regressions, I cluster the standard errors at the firm level.

Additionally, this paper also seeks to determine whether the occurrence of an executive level 10b5-1 plan transaction affects the probability of a small firm level earnings surprise. While Shon and Veliotis (2013) test whether 10b5-1 plan transactions affect a firm's likelihood of meeting or beating analyst expectations (MBE), they do not incorporate any measure of earnings management into the model. I test whether or not 10b5-1 plan transactions and respective earnings management lead to an incredibly small earnings surprise, barely passing analyst estimates, at either the 0.5 cent, 1 cent, or 1.5 cent levels. Specifically, I estimate a probit model of the following form:

$$y_{t-1} = \alpha + \beta_1 DummyTrans_t + \beta_2 Manage_{t-1} + \beta_3 X_{t-1} + \beta_4 R_t + \zeta_t + \varepsilon_t \quad (3)$$

where y is a binary measure of the occurrence of a small earnings surprise (depending on the specification this is either 1, 2, or 3), *DummyTrans* is as previously defined, *Manage* is a variable indicating the level of earnings management (abnormal discretionary expenditures, abnormal cash flows from operations, abnormal production, or abnormal performance matched accruals), R is an interaction variable between earnings management and the indicator variable for whether there is a 10b5-1 sale (purchase) by a C-suite executive in the given quarter, and all other variables are as previously defined. For this analysis, I present marginal effects and standard errors calculated using the delta method.

Table 5 presents the results from equation 2 (Table 5 Panels A, B, C, & D) where measures of earnings manipulation are juxtaposed with subsequent occurrences of 10b5-1 transactions. Moreover, within each individual panel, Column (1) controls for 10b5-1 plan purchases in a given quarter and Column (2) controls 10b-1 plan sales in a given quarter. Table 6 presents the results from equation 3 (Table 6 Panels H, J, K, & L) where

the occurrences of small earnings surprises are juxtaposed with occurrences of earnings manipulation and subsequent 10b5-1 plan transactions. As before, the execution of a sale versus a purchase is controlled for individually. The results in both equation 2 and equation 3 for the analysis of abnormal discretionary expenditures and abnormal cash flows from operations are as expected (although the latter is contrary to Roychowdhury) while the results for abnormal performance matched accruals are opposite of expectation, likely due to the fact that executives to not want to manipulate a highly scrutinized measure, such as accruals, before their own transactions. In the case of abnormal production, the results are highly contrary to expectation; potentially due to the fact that Roychowdhury's model does not accurately capture how abnormal production can be used to manipulate earnings. All other control variables give the expected result, with the exception of the Volatility S&P 500 level and the S&P500 monthly return, which are statistically insignificant. These additional control variable results hold true across all equations.

The results from equation 2 (Table 5 Panel A) and equation 3 (Table 6 Panels H1-H3) analyzing the effect of 10b5-1 sales and purchases on the manipulation of abnormal discretionary expenditures and the effect of said manipulation on the likelihood of a small earnings surprise occurring are as expected. In the analysis of abnormal discretionary expenditures, the equation 2 coefficient on *dummysales* is negative and statistically significant at the 10% level. The coefficient on *dummypurchases* is positive, but statistically insignificant. This suggests that the occurrence of a 10b5-1 sale reduces abnormal discretionary expenditures by 0.17% of firm assets in the preceding quarter. Although no statistically significant relationship is evident ahead of equity purchases,

these results indicate that managers significantly reduce discretionary expenditures ahead of their own timed equity sales. The results from equation 2 are supported further by the results in equation 3. In the case of *smallearningssurprise1* (an earnings surprise between 0 and 0.5 cents) the coefficients on both abnormal discretionary expenditures and *dummysales* are significant at the 1% level. The coefficient on *dummysales* is positive and the coefficient on abnormal discretionary expenditures is negative. This indicates that a 10b5-1 sale increases the likelihood of a small earnings beat occurring in the preceding quarter by 10.6%. Additionally, a 0.5% lower level of abnormal discretionary expenditures in terms of total firm assets increases the likelihood of preceding quarter earnings surprise occurring by 17.7% in the case of an equity sale. The results from equation 2 indicate that this downward manipulation of abnormal discretionary expenditures is indeed likely to occur ahead of high-level executive 10b5-1 sales. The reverse case holds true in the presence of an impending 10b5-1 purchase. In this case, the coefficients on abnormal discretionary expenditures and *dummypurchases* are both negative and statistically significant, at the 5% and 1% levels, respectively. This indicates that in the event of a 10b5-1 purchase the firm is 5.8% less likely to experience a previous quarter small earnings surprise. Furthermore, a 0.5% increase in the level of abnormal discretionary expenditures decreases the likelihood of a small earnings surprise by 13.8%. The results from equation 2 indicate that this manipulation is likely to occur. In the case of *smallearningssurprise2* and *smallearningssurprise3* (earnings beats between 0.5-1.0 cent and 1.0-1.5 cents) abnormal discretionary expenditures do not play a statistically significant role in the likelihood of an earnings surprise. The occurrence of

a 10b5-1 transaction remains statistically significant for purchases and sales at the 1% level at all levels of tested earnings surprises.

The results from equation 2 (Table 5 Panel B) and equation 3 (Table 6 Panels J1-J3) are also as expected in the case of abnormal cash flows from operations. The equation 2 coefficient for *dummysales* is both positive and statistically significant below the 1% level, suggesting that in the quarter preceding a 10b5-1 plan equity sale, executive level management manipulates abnormal cash flows from operations upwards in advance of said sale by 0.42% of firm assets. The opposite case occurs when executives have a 10b5-1 plan in place to purchase equity. The coefficient on *dummypurchases* is both negative and statistically significant below the 1% level, suggesting that executives manipulate abnormal cash flows from operations downwards preceding an equity purchase in amount of 0.33% of firm asset level. The signs on both of these variables are opposite of what Roychowdhury (2006) initially predicts, but not inherently incorrect. Roychowdhury asserts that lower cash flows from operations are actually what help improve a firm's bottom line because lower cash flows from operations result from sales management. Roychowdhury shows that this sales management has the ability to lead to better overall sales numbers and total profits. In turn, this would positively benefit a firm's equity price. However, in this analysis, cash flows from operations are analyzed per management's reporting on the financial statements. This leads to numerous ways cash flow management can affect underlying equity price. In order to do this, executives can actively manipulate cash flows from operations in ways that differ from sales management. Instead of reducing cash flows from operations as an equity price-boosting tactic, managers can largely increase cash flows from operations to pad their bottom line

numbers. This could be done by revenue manipulation, such as capitalizing normal operating expenditures, misclassifying inventory purchases, or creating accounting rollups through serial acquisitions. All of these strategies would move equity price in the executives' favor. This type of cash flow from operations manipulation is consistent with, and is evidenced by, the observed results.

This line of thinking is furthered by the results evidenced in equation 3 regarding abnormal cash flows from operations. Table 6 Panel J presents the results in the case of *smallsurprise1* and a 10b5-1 plan sale. In this analysis, the coefficients for abnormal cash flows from operations and *dummysales* are both positive and statistically significant below the 1% level. These positive and highly significant coefficients indicate that the occurrence of a sale increases the likelihood of a small earnings surprise in the previous quarter by 10.3%. Additionally, a 0.5% increase the level of abnormal cash flows from operations increases the likelihood of a small earnings surprise by 55.2%. This increase in abnormal cash flows from operations ahead of a sale was shown to be likely to occur in equation 2 (Table 5 Panel B). In the case of an equity purchase, the coefficients for abnormal cash flows from operations and *dummypurchases* are significant below the 1% level. The coefficient on *dummypurchases* is negative, indicating that a 10b5-1 purchase decreases the likelihood of a small earnings surprise in the previous quarter by 5.5%. A 0.5% decrease in the level of abnormal cash flows from operations decreases the changes of a small earnings surprise in the preceding quarter by 56.9%. Equation 2 shows that this manipulation is likely to occur. These results show that although Roychowdhury asserts lower cash flows from operations may influence COGS, thus padding the bottom line, massively higher cash flows from operations would also clearly positively affect equity

price. This indicates that executives are largely manipulating cash flows from operations, potentially through financial statement reclassification or revenue timing, in order to positively influence their potential equity trade returns. These results hold true for the occurrence of *smallsurprise2* and *smallsurprise3*, and remain significant at the 1% level.

The results from equation 2 (Table 5 Panel C) and equation 3 (Table 6 Panels K1-K3) are contrary to expectation in the case of abnormal production. The equation 2 coefficient on *dummysales* is negative and statistically significant below the 1% level. This suggests that ahead of equity sales, managers manipulate abnormal production downwards by 0.46% of assets. The coefficient on *dummypurchases* is positive and statistically significant at the 5% level, indicting that managers manipulate abnormal production upwards by 0.24% of firm assets in advance of an equity purchase. The signs on these coefficients are contrary to expectation, suggesting that management is not using abnormal production levels to manipulate earnings in the manner initially expected according to Roychowdhury (2006). These results do, however, indicate that abnormal production is influenced by 10b5-1 plan transactions. This implies that abnormal production may be used as a means for other manipulation opposite of what Roychowdhury has expected. The result from equation 3 (Table 6 Panel K) furthers this assumption. In the case of a 10b5-1 sale, the coefficient for abnormal production is negative and statistically significant below the 1% level. The coefficient on *dummysales* is positive and statistically significant below the 1% level. This indicates that lower abnormal production levels in amount of 0.5% of firm assets contribute to a 22.9% higher likelihood of a small earnings surprise in the previous quarter. This indicates that abnormal production increases reduce the likelihood of a small earnings surprise. The

same intuition holds true in the case of a 10b5-1 purchase. The coefficient for abnormal production remains negative and statistically significant below the 1% level, confirming that 0.5% increases in abnormal production decrease the likelihood of a small earnings surprise by 22.2%. These results hold true for the occurrence of *smallsurprise2* and *smallsurprise3*, and remain significant at the 1% level. This observed result and intuition is contrary to Roychowdhury (2006). This could be due to the inherent differences between studies. Roychowdhury examines the overall effect of abnormal production manipulation on earnings levels, while this study only examines the effect of said manipulation on a small earnings surprise. Furthermore, Roychowdhury's abnormal production model may not accurately capture how abnormal production affects the likelihood of a small earnings surprise. This is a relationship that requires additional study.

The results from equation 2 (Table 5 Panel D) and equation 3 (Table 6 Panels L1-L3) are contrary to expectation in the case of abnormal performance matched accruals. Equation 2 results indicate that there is no statistically significant relationship between abnormal performance matched accruals and the occurrence of a 10b5-1 plan purchase. In regards to a 10b5-1 plan sale, the coefficient on abnormal performance matched accruals is negative and statistically significant below the 1% level. This sign is opposite of expectations. Ahead of a 10b5-1 sale, expectations were that abnormal performance match accruals would be managed upward in order to create a high equity price. This is not the case. The fact that accruals are being significantly managed downward by 0.43% of assets ahead of a 10b5-1 equity sale indicates that accruals are not the active account being manipulated by executives ahead of their own insider trades. This intuition is

corroborated by the results from equation 3 (Table 6 Panels L1-L3). In both the case of a 10b5-1 sale or a 10b5-1 purchase, the coefficient on *PMabnormalaccruals* is positive and statistically insignificant. This indicates that the level of abnormal performance matched accruals does not play a role in the likelihood of a small earnings surprise in the previous quarter. Due to the fact that accrual management is so highly scrutinized in today's environment, executives may prefer to manipulate earnings through an account that is less scrutinized. It would follow that earnings management should be achieved through other methods, such as abnormal discretionary expenditure management and abnormal cash flows from operations.

The results have shown that high-level executives do manipulate earnings ahead of their own 10b5-1 transactions. Specifically, insiders manage abnormal discretionary expenditures and abnormal cash flows from operations to move equity prices in their favor before their own sales and purchases. Additionally, insiders prefer to manipulate earnings through these identified real activities, as opposed to through accruals, which are more heavily scrutinized. Lastly, the results indicate that abnormal production is not being manipulated in the fashion originally presumed. Abnormal production may be used as an earnings manipulation tactic, but only if Roychowdhury's model does not accurately capture how production is used to manipulate earnings.

## IV. Conclusion

The Securities Exchange Commission (SEC), in response to its longstanding concern with insider trading, created a special set of restrictions to be followed under Rule 10b5-1 that allows insiders to trade equity for firms in which they possess material nonpublic information about. The climate surrounding 10b5-1 plans and their use is shifting increasingly negative. Prior research has shown that participants in 10b5-1 plan transactions generate abnormally above average returns on said trades (see for example Jagolinzer (2008)). Additionally, prior research has shown that firms whose high-level executives participate in 10b5-1 equity transactions meet or beat analyst earnings expectations at a greater frequency than firms whose insiders do not execute 10b5-1 equity transactions (see for example Shon and Veliotis (2013)).

This analysis contributes to existing literature by examining the means by which participants in 10b5-1 plan trades generate abnormal trade returns and meet or beat analyst expectations. I further examine how firms are likely to achieve such results, i.e., through the manipulation of discretionary expenditures and/or cash flows from operations. Finally, I examine whether these earnings manipulations increase the likelihood of the firm exhibiting a small earnings surprise.

The results of this study provide suggestive evidence that executives engage in earnings manipulation ahead of their own 10b5-1 plan trades. The analysis further suggests that executives appear to manipulate discretionary expenditures and cash flows from operations in an attempt to generate better personal trade returns. While I also find suggestive evidence that high-level executives may potentially manage earnings through the manipulation of abnormal production, this assertion requires further research

regarding modeling techniques for the effect of abnormal production on small earnings surprises. There is also evidence to suggest that executives are likely to avoid manipulating a financial account that already receives heightened scrutiny, such as accruals. Moreover, they appear to be more likely to conduct manipulation through a means not often discussed by regulators, such as through discretionary expenditures or cash flows from operations.

These findings may be particularly relevant to government regulators, who are tasked with maintaining the integrity of Rule 10b5 and Rule 10b5-1. The SEC routinely refers to the participation in a 10b5-1 plan as a "defense" mechanism.[9] However, a mechanism that allows for participants to generate above average returns, to have their own firm's equity routinely benefit from meeting or beating analyst expectations, and to have participants who manipulate their own firm's financial accounts ahead of their own trades, seems more offensive than defensive and against the SEC's original intentions. Managing discretionary expenditures and cash flows from operations is not inherently in violation of any rules. However, when these manipulations take place in the quarter preceding an executive's own 10b5-1 equity trades, and these manipulations have been shown to actively assist in the occurrence of small earnings surprises, it is due further attention and discussion.

[9] See SEC Final Rule: Selective Disclosure and Insider Trading. SECURITIES AND EXCHANGE COMMISSION. 17 CFR Parts 240, 243, and 249. Release Nos. 33-7881, 34-43154, IC-24599, File No. S7-31-99. RIN 3235-AH82. Selective Disclosure and Insider Trading

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Table 1 List of Variable Definitions

| | |
|---|---|
| **Abnormalcfo** | Abnormal cash flows from operations. The level of firm cash flows from operations that are above the industry average, controlling for factors that influence cash flows from operations to fluctuate. |
| **Abnormaldisc** | Abnormal discretionary expenditures. The level of firm discretionary expenditures that are above the industry average, controlling for factors that influence discretionary expenditures to fluctuate. |
| **Abnormalaccruals** | Abnormal performance matched accruals. The level of firm accruals that are above the industry average, controlling for factors that influence accrual manipulation. |
| **Abnormalprod** | Abnormal production- the level of firm production that is above the industry average, controlling for factors that influence production to fluctuate. |
| **Change in sales over assets** | The percentage change in a firm's sales from one quarter to the next, divided by the percentage change in a firm's assets over the same time frame. |
| **Debtoverassets** | The firm's entire value of debt (both short and long term) divided by the firm's entire value of assets. This variable is a proxy for leverage and closeness to violating debt covenants. |
| **Dummypurchases** | A binary variable equal to 1 if there was a 10b5-1 purchase by a high-level executive in the given quarter. Equal to 0 if a 10b5-1 purchase did not occur. |
| **Dummysales** | A binary variable equal to 1 if there was a 10b5-1 sale by a high-level executive in the given quarter. Equal to 0 if a 10b5-1 sale did not occur. |
| **Equity purchase** | The purchase of a firm's common stock shares by an insider of that firm. |
| **Equity sale** | The sale of a firm's common stock shares by an insider of that firm. |
| **Excessreturn** | The compounded three-month return percentage of a firm's equity out (under) performance over the S&P500 index. |
| **Inside information** | Any information regarding a firm that may be relevant to its current market standing that is not known by the general trading public. |

| | |
|---|---|
| **Insider** | One who possesses material nonpublic information regarding a firm. |
| **Insider trade** | A trade made by someone who possesses material nonpublic information regarding the firm whose equity was traded upon. |
| **Inverse of assets** | The reciprocal (1/assets) of a firm's asset level, as denoted by the financial statements. |
| **Logmarketcap** | The logarithmic function of the total dollar market value of a firm's total number of outstanding shares. |
| **Markettobook** | The ratio of the firm's total market capitalization divided by the firm's total book value. This variable represents how the market perceives equity to be fairly valued. |
| **Property plan and equipment (PPE)** | The level of property, plan, and equipment owned by a firm, as denoted by the financial statements. |
| **Sales over assets** | The level of a firm's sales divided by that firm's total assets. |
| **Shareturnover** | The volume of a firm's shares traded per day divided by the firm's total outstanding float. This variable is a proxy for firm share liquidity. Denoted salesshareturnover in sales regressions, purchasesshareturnover in purchases regressions. Summary statistics are for all total equities share turnover. |
| **Sic2** | Standard Industrial Classification code at the two-digit level. |
| **Smallsurprise1** | A binary variable that equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 0.0 cents but less than 0.5 cents. |
| **Smallsurprise2** | A binary variable that equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 0.5 cents but less than 1.0 cents. |
| **Smallsurprise3** | A binary variable that equals 1 if a firm's quarterly earnings per share reporting beat analyst expectations by greater than 1.0 cents but less than 1.5 cents. |
| **Spreturn** | The month over month return of the S&P500 index. |

*Note that whether or not a variable has 'w01' as a prefix as listed in tables, it has been winsorized at the .01 level.

Table 2: Descriptive Statistics

Table 2 Descriptive Statistics

| Variable | n | mean | sd | max | min | sk | 5% | 25% | 50% | 75% | 95% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Abnormaldisc | 45086 | 0.0015 | 0.037 | 0.149 | -0.080 | 1.262 | -0.051 | -0.017 | -0.001 | 0.012 | 0.075 |
| Abnormalcfo | 53809 | 0.0004 | 0.036 | 0.102 | -0.130 | -0.587 | -0.062 | -0.013 | 0.001 | 0.017 | 0.057 |
| Abnormalprod | 48661 | -0.0017 | 0.047 | 0.169 | -0.138 | 0.456 | -0.078 | -0.022 | -0.002 | 0.017 | 0.078 |
| AbnormalPMaccruals | 53809 | -0.0002 | 0.038 | 0.118 | -0.166 | -0.900 | -0.060 | -0.013 | 0.001 | 0.016 | 0.055 |
| Smallsurprise1 | 53425 | 0.473 | 0.499 | 1 | 0 | 0.107 | 0 | 0 | 0 | 1 | 1 |
| Smallsurprise2 | 53425 | 0.553 | 0.497 | 1 | 0 | -0.214 | 0 | 0 | 1 | 1 | 1 |
| Smallsurprise3 | 53425 | 0.585 | 0.493 | 1 | 0 | -0.343 | 0 | 0 | 1 | 1 | 1 |
| dummysales | 53809 | 0.180 | 0.384 | 1 | 0 | 1.664 | 0 | 0 | 0 | 0 | 1 |
| dummypurchases | 53809 | 0.062 | 0.242 | 1 | 0 | 3.621 | 0 | 0 | 0 | 0 | 1 |
| vix | 53809 | 23.8 | 9.0 | 44.1 | 13.5 | 1.0 | 13.7 | 16.9 | 21.7 | 26.4 | 43.0 |
| spreturn | 53809 | 0.0032 | 0.05 | 0.09 | -0.09 | -0.47 | -0.09 | -0.02 | 0.01 | 0.03 | 0.09 |
| debtoverassets | 51481 | 260.14 | 1013.79 | 8039.92 | 0.00 | 6.18 | 0.00 | 0.18 | 5.45 | 66.98 | 1125.49 |
| salessharetturnover | 53800 | 1.91 | 1.77 | 10.33 | 0.08 | 2.28 | 0.22 | 0.77 | 1.41 | 2.40 | 5.37 |
| purchasessharetturnover | 53800 | 1.91 | 1.77 | 10.33 | 0.08 | 2.28 | 0.22 | 0.77 | 1.41 | 2.40 | 5.37 |
| logmarketcap | 53795 | 13.55 | 1.79 | 18.06 | 9.70 | 0.20 | 10.69 | 12.27 | 13.47 | 14.75 | 0.20 |
| excessreturn | 53766 | 0.011 | 0.22 | 0.88 | -0.51 | 0.90 | -0.32 | -0.11 | -0.01 | 0.11 | 0.90 |
| markettobook | 53794 | 1216.16 | 1365.32 | 7827.30 | 19.91 | 2.48 | 75.28 | 367.05 | 787.43 | 1518.95 | 3976.59 |

## Table 3: Correlations

Table 3 Correlations

| | Abnormaldisc | Abnormalcfo | Abnormalprod | abnormalaccruals | Smallsurprise1 | Smallsurprise2 | Smallsurprise3 | dummysales | dummypurchases |
|---|---|---|---|---|---|---|---|---|---|
| Abnormaldisc | 1 | | | | | | | | |
| Abnormalcfo | -0.172 | 1 | | | | | | | |
| Abnormalprod | -0.588 | -0.306 | 1 | | | | | | |
| AbnormalPMaccruals | -0.108 | -0.433 | 0.067 | 1 | | | | | |
| Smallsurprise1 | -0.034 | 0.134 | -0.066 | 0.038 | 1 | | | | |
| Smallsurprise2 | -0.027 | 0.133 | -0.070 | 0.039 | 0.849 | 1 | | | |
| Smallsurprise3 | -0.025 | 0.134 | -0.070 | 0.039 | 0.798 | 0.939 | 1 | | |
| dummysales | 0.042 | 0.083 | -0.068 | -0.020 | 0.172 | 0.164 | 0.157 | 1 | |
| dummypurchases | 0.013 | -0.041 | 0.022 | -0.012 | -0.075 | -0.074 | -0.070 | -0.122 | 1 |
| vix | -0.005 | 0.008 | -0.007 | 0.009 | -0.075 | -0.064 | -0.058 | -0.064 | 0.083 |
| spreturn | 0.003 | -0.002 | 0.002 | -0.003 | 0.021 | 0.022 | 0.020 | 0.038 | -0.094 |
| debtoverassets | -0.057 | 0.034 | 0.009 | 0.014 | 0.043 | 0.036 | 0.031 | -0.023 | -0.019 |
| salesshareturnover | 0.031 | 0.021 | -0.040 | -0.027 | 0.011 | 0.020 | 0.024 | 0.079 | -0.028 |
| purchasesshareturnover | 0.031 | 0.021 | -0.040 | -0.027 | 0.011 | 0.020 | 0.024 | 0.079 | -0.028 |
| logmarketcap | -0.142 | 0.195 | -0.034 | 0.041 | 0.322 | 0.286 | 0.259 | 0.198 | -0.013 |
| excessreturn | 0.010 | 0.052 | -0.031 | 0.024 | 0.070 | 0.083 | 0.090 | 0.086 | -0.064 |
| markettobook | 0.281 | 0.087 | -0.313 | -0.018 | 0.195 | 0.161 | 0.144 | 0.212 | -0.078 |

## Table 3: Correlations continued

Table 3 Correlations

| | vix | spreturn | debtoverassets | salesshareturnover | purchasesshareturnover | logmarketcap | excessreturn | markettobook |
|---|---|---|---|---|---|---|---|---|
| Abnormaldisc | | | | | | | | |
| Abnormalcfo | | | | | | | | |
| Abnormalprod | | | | | | | | |
| AbnormalPMaccruals | | | | | | | | |
| Smallsurprise1 | | | | | | | | |
| Smallsurprise2 | | | | | | | | |
| Smallsurprise3 | | | | | | | | |
| dummysales | | | | | | | | |
| dummypurchases | | | | | | | | |
| vix | 1 | | | | | | | |
| spreturn | -0.567 | 1 | | | | | | |
| debtoverassets | -0.003 | -0.003 | 1 | | | | | |
| salesshareturnover | 0.123 | -0.095 | 0.037 | 1 | | | | |
| purchasesshareturnover | 0.123 | -0.095 | 0.037 | 1.000 | 1 | | | |
| logmarketcap | -0.124 | 0.029 | 0.359 | 0.262 | 0.262 | 1 | | |
| excessreturn | -0.050 | 0.034 | -0.002 | 0.060 | 0.060 | 0.094 | 1 | |
| markettobook | -0.114 | 0.043 | -0.112 | 0.095 | 0.095 | 0.190 | 0.127 | 1 |

## Table 4: Pairwise / Pearson Correlations

Table 4 Pairwise / Pearson Correlation

| | Abnormaldisc | Abnormalcfo | Abnormalprod | abnormalaccruals | Smallsurprise1 | Smallsurprise2 | Smallsurprise3 | dummysales | dummypurchases |
|---|---|---|---|---|---|---|---|---|---|
| Abnormaldisc | 1 | | | | | | | | |
| Abnormalcfo | **-0.175** | 1 | | | | | | | |
| Abnormalprod | **-0.586** | **-0.356** | 1 | | | | | | |
| AbnormalPMaccruals | **-0.121** | **-0.429** | **0.029** | 1 | | | | | |
| Smallsurprise1 | **-0.033** | **0.137** | **-0.093** | **0.032** | 1 | | | | |
| Smallsurprise2 | **-0.028** | **0.134** | **-0.093** | **0.039** | **0.852** | 1 | | | |
| Smallsurprise3 | **-0.026** | **0.132** | **-0.090** | **0.040** | **0.799** | **0.938** | 1 | | |
| dummysales | **0.041** | **0.082** | **-0.074** | **-0.019** | **0.168** | **0.159** | **0.151** | 1 | |
| dummypurchases | **0.011** | **-0.044** | **0.027** | -0.005 | **-0.073** | **-0.074** | **-0.070** | **-0.121** | 1 |
| vix | -0.005 | **0.012** | **-0.010** | 0.008 | **-0.066** | **-0.058** | **-0.052** | **-0.056** | **0.071** |
| spreturn | 0.004 | 0.000 | 0.002 | -0.004 | **0.020** | **0.022** | **0.021** | **0.038** | **-0.092** |
| debtoverassets | **-0.055** | **0.026** | -0.004 | 0.017 | **0.023** | **0.014** | **0.011** | **-0.028** | **-0.007** |
| salesshareturnover | **0.035** | **0.012** | **-0.027** | **-0.033** | 0.005 | **0.010** | **0.012** | **0.067** | **-0.018** |
| purchasesshareturnover | **0.035** | **0.012** | **-0.027** | **-0.033** | 0.005 | **0.010** | **0.012** | **0.067** | **-0.018** |
| logmarketcap | **-0.136** | **0.188** | **-0.076** | **0.036** | **0.311** | **0.274** | **0.247** | **0.193** | **-0.126** |
| excessreturn | 0.009 | **0.048** | **-0.025** | 0.002 | **0.073** | **0.081** | **0.087** | **0.087** | **-0.058** |
| markettobook | **0.283** | **0.015** | **-0.136** | **-0.031** | **0.151** | **0.125** | **0.111** | **0.185** | **-0.065** |

Numbers in bold are significant at 5% level

## Table 4: Pairwise / Pearson Correlations continued

Table 4 Pairwise / Pearson Correlation

| | vix | spreturn | debtoverassets | salesshareturnover | purchasesshareturnover | logmarketcap | excessreturn | markettobook |
|---|---|---|---|---|---|---|---|---|
| Abnormaldisc | | | | | | | | |
| Abnormalcfo | | | | | | | | |
| Abnormalprod | | | | | | | | |
| AbnormalPMaccruals | | | | | | | | |
| Smallsurprise1 | | | | | | | | |
| Smallsurprise2 | | | | | | | | |
| Smallsurprise3 | | | | | | | | |
| dummysales | | | | | | | | |
| dummypurchases | | | | | | | | |
| vix | 1 | | | | | | | |
| spreturn | **-0.523** | 1 | | | | | | |
| debtoverassets | -0.008 | **-0.002** | 1 | | | | | |
| salesshareturnover | **0.110** | **-0.099** | **0.065** | 1 | | | | |
| purchasesshareturnover | **0.110** | **-0.099** | **0.065** | **1.000** | 1 | | | |
| logmarketcap | **-0.111** | **0.030** | **0.350** | **0.232** | **0.232** | 1 | | |
| excessreturn | **-0.037** | **0.030** | **-0.013** | **0.068** | **0.068** | **0.105** | 1 | |
| markettobook | **-0.109** | **0.039** | **-0.134** | **0.096** | **0.096** | **0.124** | **0.144** | 1 |

Numbers in bold are significant at 5% level

Table 5: Model 2 Regression of Earnings Management on Insider Transactions

Table 5 Regression of Earnings Management on Insider Transactions

| Variables | Panel A - abnormaldisc | | Panel B- abnormalcfo | | Panel C- abnormalprod | | Panel D- abnormalaccruals | |
|---|---|---|---|---|---|---|---|---|
| | Purchases | Sales | Purchases | Sales | Purchases | Sales | Purchases | Sales |
| dummypurchases | 0.00136 | | -0.00329*** | | 0.00241** | | 0.000833 | |
| | 1.432 | | -3.749 | | 1.990 | | 0.852 | |
| dummysales | | -0.00175* | | 0.00420*** | | -0.00463*** | | -0.00428*** |
| | | -1.920 | | 6.968 | | -4.660 | | -7.148 |
| w01vix | 2.69e-05 | 7.74e-05 | -8.27e-05 | -8.13e-05 | -0.000220* | -0.000220* | 8.45e-05 | 8.55e-05 |
| | 0.353 | 1.018 | -0.906 | -0.893 | -1.885 | -1.886 | 0.674 | 0.683 |
| w01spreturn | -0.00345 | -0.00359 | 0.00485 | 0.00486 | -0.0127 | -0.0124 | -0.0145 | -0.0143 |
| | -0.373 | -0.386 | 0.531 | 0.534 | -1.086 | -1.059 | -1.106 | -1.093 |
| w01debtoverassets | 2.29e-06*** | -1.40e-06*** | -1.70e-06*** | -1.60e-06*** | 1.25e-07 | 1.21e-08 | 9.64e-07*** | 8.55e-07*** |
| | 6.215 | -4.538 | -5.704 | -5.410 | 0.260 | 0.0253 | 4.731 | 4.224 |
| w01purchasessharetturnover | 0.00137*** | | -0.000869*** | | 6.97e-05 | | -0.000585*** | |
| | 5.314 | | -4.621 | | 0.239 | | -3.587 | |
| w01salessharetturnover | | 0.000305 | | -0.000893*** | | 9.70e-05 | | -0.000562*** |
| | | 1.158 | | -4.756 | | 0.334 | | -3.455 |
| w01logmarketcap | -0.00501*** | | 0.00464*** | 0.00451*** | -0.00170*** | -0.00153*** | -0.00109*** | -0.000913*** |
| | -13.73 | | 18.85 | 18.45 | -3.951 | -3.612 | -6.000 | -5.116 |
| w01excessreturn | -0.00338*** | -0.00628*** | 0.00470*** | 0.00457*** | 0.000323 | 0.000527 | -0.00296** | -0.00272** |
| | -3.638 | -6.635 | 5.154 | 5.030 | 0.262 | 0.428 | -2.459 | -2.264 |
| w01marketobook | 1.12e-05*** | 1.02e-05*** | -4.23e-07 | -5.72e-07 | -5.60e-06*** | -5.43e-06*** | 6.13e-08 | 2.25e-07 |
| | 16.60 | 15.15 | -0.914 | -1.227 | -6.926 | -6.656 | 0.194 | 0.712 |
| Constant | 0.0527*** | -0.0113** | -0.0633*** | -0.0624*** | 0.0292** | 0.0279** | 0.00854 | 0.00697 |
| | 6.751 | -2.420 | -3.968 | -3.863 | 2.409 | 2.263 | 0.417 | 0.338 |
| Observations | 43,571 | 43,571 | 51,439 | 51,439 | 46,588 | 46,588 | 51,439 | 51,439 |
| R-squared | 0.140 | 0.099 | 0.047 | 0.048 | 0.028 | 0.029 | 0.004 | 0.006 |
| Time period dummies? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 6.1: Model 3 Panel H Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormaldisc focus

| Table 6 Panel H Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormaldisc focus | | | | | | |
|---|---|---|---|---|---|---|
| Variables | Panel H1: Smallsurprise1 | | Panel H2: Smallsurprise2 | | Panel H3: Smallsurprise3 | |
| | Sales | Purchases | Sales | Purchases | Sales | Purchases |
| w01abnormaldisc | -0.353*** | -0.276** | -0.183 | -0.113 | -0.114 | -0.0743 |
| | -2.891 | -2.290 | -1.625 | -1.015 | -1.063 | -0.698 |
| dummysales | 0.106*** | | 0.109*** | | 0.109*** | |
| | 12.74 | | 13.53 | | 13.95 | |
| dummysalesiadisc | 0.174 | | 0.201 | | 0.0908 | |
| | 0.892 | | 1.015 | | 0.478 | |
| dummypurchases | | -0.0579*** | | -0.0631*** | | -0.0579*** |
| | | -4.615 | | -5.254 | | -4.951 |
| dummypurchasesiadisc | | -0.301 | | -0.163 | | -0.0327 |
| | | -0.877 | | -0.530 | | -0.108 |
| w01vix | 0.00159 | 0.00159 | 0.000578 | 0.000586 | 0.00128 | 0.00129 |
| | 1.255 | 1.257 | 0.458 | 0.465 | 1.026 | 1.035 |
| w01spreturn | 0.0529 | 0.0552 | -0.0194 | -0.0160 | -0.0661 | -0.0618 |
| | 0.371 | 0.389 | -0.145 | -0.120 | -0.510 | -0.479 |
| w01salesshareturnover | -0.0229*** | | -0.0165*** | | -0.0137*** | |
| | -9.439 | | -7.555 | | -6.644 | |
| w01purchasesshareturnover | | -0.0221*** | | -0.0157*** | | -0.0129*** |
| | | -9.134 | | -7.221 | | -6.299 |
| w01logmarketcap | 0.114*** | 0.118*** | 0.0974*** | 0.101*** | 0.0856*** | 0.0892*** |
| | 40.48 | 41.50 | 36.67 | 37.75 | 33.62 | 34.81 |
| w01debtoverassets | -4.11e-05*** | -4.39e-05*** | -3.55e-05*** | -3.85e-05*** | -3.20e-05*** | -3.50e-05*** |
| | -7.877 | -8.476 | -7.812 | -8.555 | -7.355 | -8.139 |
| w01excessreturn | 0.0631*** | 0.0685*** | 0.0928*** | 0.0976*** | 0.114*** | 0.119*** |
| | 5.305 | 5.751 | 8.031 | 8.420 | 9.938 | 10.33 |
| w01markettobook | 4.98e-05*** | 5.41e-05*** | 3.13e-05*** | 3.57e-05*** | 2.30e-05*** | 2.75e-05*** |
| | 11.91 | 12.72 | 7.931 | 8.945 | 6.130 | 7.220 |
| Psuedo R2 | 0.1381 | 0.1346 | 0.1133 | 0.1095 | 0.1006 | 0.0965 |
| Walden Chi2(87) | 3678.15 | 3428.12 | 3236.32 | 3025.27 | 3002.11 | 2806.03 |
| Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Observations | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 |
| Time period dummies? | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies? | Yes | Yes | Yes | Yes | Yes | Yes |

Table 6.2: Model 3 Panel J Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalcfo focus

| Table 6 Model 3 Panel J Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalcfo focus | | | | | | |
|---|---|---|---|---|---|---|
| Variables | Panel J1: Smallsurprise1 | | Panel J2: Smallsurprise2 | | Panel J3: Smallsurprise3 | |
| | Sales | Purchases | Sales | Purchases | Sales | Purchases |
| w01abnormalcfo | 1.105*** | 1.137*** | 1.191*** | 1.222*** | 1.235*** | 1.269*** |
| | 11.15 | 11.37 | 12.68 | 12.92 | 13.76 | 14.03 |
| dummysales | 0.103*** | | 0.105*** | | 0.105*** | |
| | 12.33 | | 13.07 | | 13.44 | |
| dummysalesiadisc | -0.0418 | | 0.147 | | 0.105 | |
| | -0.222 | | 0.777 | | 0.577 | |
| dummypurchases | | -0.0553*** | | -0.0607*** | | -0.0557*** |
| | | -4.430 | | -5.088 | | -4.785 |
| dummypurchasesiadisc | | -0.320 | | -0.0159 | | 0.163 |
| | | -0.939 | | -0.0526 | | 0.546 |
| w01vix | 0.00166 | 0.00166 | 0.000636 | 0.000653 | 0.00135 | 0.00137 |
| | 1.308 | 1.310 | 0.504 | 0.518 | 1.079 | 1.096 |
| w01spreturn | 0.0491 | 0.0526 | -0.0215 | -0.0173 | -0.0701 | -0.0654 |
| | 0.343 | 0.369 | -0.160 | -0.129 | -0.536 | -0.502 |
| w01salesshareturnover | -0.0226*** | | -0.0158*** | | -0.0129*** | |
| | -9.406 | | -7.329 | | -6.296 | |
| w01purchasesshareturnover | | -0.0218*** | | -0.0150*** | | -0.0120*** |
| | | -9.121 | | -6.976 | | -5.931 |
| w01logmarketcap | 0.112*** | 0.115*** | 0.0939*** | 0.0969*** | 0.0815*** | 0.0847*** |
| | 39.82 | 40.81 | 35.61 | 36.63 | 32.33 | 33.48 |
| w01debtoverassets | -4.03e-05*** | -4.29e-05*** | -3.43e-05*** | -3.70e-05*** | -3.06e-05*** | -3.33e-05*** |
| | -7.835 | -8.399 | -7.613 | -8.300 | -7.073 | -7.805 |
| w01excessreturn | 0.0606*** | 0.0657*** | 0.0892*** | 0.0936*** | 0.110*** | 0.115*** |
| | 5.080 | 5.499 | 7.720 | 8.079 | 9.584 | 9.951 |
| w01markettobook | 4.60e-05*** | 5.02e-05*** | 2.90e-05*** | 3.38e-05*** | 2.13e-05*** | 2.60e-05*** |
| | 11.57 | 12.52 | 7.676 | 8.928 | 5.921 | 7.188 |
| Psuedo R2 | 0.1411 | 0.1379 | 0.1174 | 0.1139 | 0.1053 | 0.1015 |
| Walden Chi2(87) | 3789.88 | 3539.14 | 3356.58 | 3139.39 | 3140.56 | 2942.07 |
| Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Observations | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 |
| Time period dummies? | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies? | Yes | Yes | Yes | Yes | Yes | Yes |

Table 6.3: Model 3 Panel K Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalprod focus

| Table 6 Panel K Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalprod focus | | | | | | |
|---|---|---|---|---|---|---|
| Variables | Panel K1: Smallsurprise1 | | Panel K2: Smallsurprise2 | | Panel K3: Smallsurprise3 | |
| | Sales | Purchases | Sales | Purchases | Sales | Purchases |
| w01abnormalprod | -0.458*** | -0.443*** | -0.615*** | -0.610*** | -0.683*** | -0.665*** |
| | -4.971 | -4.822 | -7.314 | -7.264 | -8.551 | -8.343 |
| dummysales | 0.104*** | | 0.107*** | | 0.107*** | |
| | 11.93 | | 12.77 | | 13.23 | |
| dummysalesiadisc | -0.408** | | -0.303 | | -0.401** | |
| | -2.069 | | -1.526 | | -2.108 | |
| dummypurchases | | -0.0534*** | | -0.0551*** | | -0.0496*** |
| | | -3.983 | | -4.348 | | -4.017 |
| dummypurchasesiadisc | | -0.731** | | -0.590* | | -0.414 |
| | | -2.059 | | -1.863 | | -1.317 |
| w01vix | 0.00126 | 0.00125 | 0.000325 | 0.000335 | 0.00104 | 0.00105 |
| | 0.962 | 0.957 | 0.249 | 0.257 | 0.807 | 0.819 |
| w01spreturn | 0.00959 | 0.0199 | -0.0598 | -0.0496 | -0.0890 | -0.0780 |
| | 0.0620 | 0.129 | -0.406 | -0.338 | -0.618 | -0.543 |
| w01salesshareturnover | -0.0246*** | | -0.0179*** | | -0.0145*** | |
| | -9.675 | | -7.820 | | -6.705 | |
| w01purchasesshareturnover | | -0.0239*** | | -0.0172*** | | -0.0139*** |
| | | -9.454 | | -7.557 | | -6.453 |
| w01logmarketcap | 0.116*** | 0.120*** | 0.0984*** | 0.102*** | 0.0863*** | 0.0901*** |
| | 39.85 | 40.95 | 35.83 | 37.00 | 32.79 | 34.09 |
| w01debtoverassets | -4.14e-05*** | -4.42e-05*** | -3.51e-05*** | -3.80e-05*** | -3.12e-05*** | -3.43e-05*** |
| | -7.768 | -8.363 | -7.145 | -7.861 | -6.629 | -7.392 |
| w01excessreturn | 0.0612*** | 0.0669*** | 0.0927*** | 0.0980*** | 0.113*** | 0.119*** |
| | 4.846 | 5.286 | 7.606 | 8.013 | 9.289 | 9.715 |
| w01markettobook | 4.25e-05*** | 4.60e-05*** | 2.31e-05*** | 2.72e-05*** | 1.44e-05*** | 1.82e-05*** |
| | 9.993 | 10.68 | 5.758 | 6.694 | 3.770 | 4.727 |
| Pseudo R2 | 0.1382 | 0.1349 | 0.1141 | 0.1104 | 0.1019 | 0.0978 |
| Walden Chi2(87) | 3457.72 | 3237.4 | 3022.64 | 2832.52 | 2793.93 | 2605.65 |
| Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Observations | 39,295 | 39,295 | 39,295 | 39,295 | 39,295 | 39,295 |
| Time period dummies? | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies? | Yes | Yes | Yes | Yes | Yes | Yes |

Table 6.4: Model 3 Panel L Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalaccruals focus

| Table 6 Panel L Regression of Small Earnings Surprise on Insider Transactions and Earnings Management - Abnormalaccruals focus | | | | | | |
|---|---|---|---|---|---|---|
| Variables | Panel L1: Smallsurprise1 | | Panel L2: Smallsurprise2 | | Panel L3: Smallsurprise3 | |
| | Sales | Purchases | Sales | Purchases | Sales | Purchases |
| w01PMabnormalaccruals | 0.0458 | 0.0169 | -0.00483 | -0.0362 | -0.0113 | -0.0416 |
| | 0.770 | 0.284 | -0.0830 | -0.618 | -0.198 | -0.729 |
| dummysales | 0.107*** | | 0.109*** | | 0.109*** | |
| | 12.81 | | 13.57 | | 13.98 | |
| dummysalesiadisc | -0.129 | | 0.0410 | | -0.00947 | |
| | -0.674 | | 0.214 | | -0.0513 | |
| dummypurchases | | -0.0575*** | | -0.0629*** | | -0.0578*** |
| | | -4.581 | | -5.238 | | -4.940 |
| dummypurchasesiadisc | | -0.539 | | -0.261 | | -0.0978 |
| | | -1.602 | | -0.865 | | -0.331 |
| w01vix | 0.00159 | 0.00158 | 0.000578 | 0.000587 | 0.00128 | 0.00129 |
| | 1.251 | 1.247 | 0.458 | 0.466 | 1.027 | 1.038 |
| w01spreturn | 0.0531 | 0.0560 | -0.0194 | -0.0161 | -0.0662 | -0.0622 |
| | 0.373 | 0.395 | -0.145 | -0.121 | -0.511 | -0.481 |
| w01salesshareturnover | -0.0232*** | | -0.0167*** | | -0.0139*** | |
| | -9.547 | | -7.628 | | -6.703 | |
| w01purchasesshareturnover | | -0.0225*** | | -0.0159*** | | -0.0131*** |
| | | -9.278 | | -7.302 | | -6.368 |
| w01logmarketcap | 0.116*** | 0.119*** | 0.0982*** | 0.101*** | 0.0861*** | 0.0896*** |
| | 41.14 | 42.12 | 37.16 | 38.19 | 34.06 | 35.21 |
| w01debtoverassets | -4.18e-05*** | -4.45e-05*** | -3.59e-05*** | -3.87e-05*** | -3.22e-05*** | -3.51e-05*** |
| | -8.010 | -8.591 | -7.895 | -8.611 | -7.409 | -8.176 |
| w01excessreturn | 0.0642*** | 0.0696*** | 0.0933*** | 0.0980*** | 0.115*** | 0.120*** |
| | 5.403 | 5.847 | 8.090 | 8.470 | 9.984 | 10.37 |
| w01markettobook | 4.67e-05*** | 5.10e-05*** | 2.96e-05*** | 3.45e-05*** | 2.20e-05*** | 2.66e-05*** |
| | 11.54 | 12.43 | 7.726 | 8.909 | 6.028 | 7.227 |
| Pseudo R2 | 0.1378 | 0.1344 | 0.1132 | 0.1095 | 0.1006 | 0.0965 |
| Walden Chi2(87) | 3688.02 | 3434.79 | 3236.91 | 3023.02 | 3002.12 | 2805.18 |
| Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Observations | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 | 43,128 |
| Time period dummies? | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry dummies? | Yes | Yes | Yes | Yes | Yes | Yes |

Table 7 Differences in Means

| Variable | Sale | No Sale | Difference | t |
|---|---|---|---|---|
| Abnormaldisc | 0.0047 | 0.0007 | 0.0040 | 4.0 |
| Abnormalcfo | 0.0066 | -0.0010 | 0.0076 | 12.7 |
| Abnormalprod | -0.0090 | -0.0001 | -0.0089 | -8.8 |
| Abnormalaccruals | -0.0063 | -0.0011 | -0.0051 | -9.1 |

| Variable | Purchase | No Purchase | Difference | t |
|---|---|---|---|---|
| Abnormaldisc | 0.0030 | 0.0014 | 0.0017 | 1.6 |
| Abnormalcfo | -0.0057 | 0.0008 | -0.0065 | -7.5 |
| Abnormalprod | 0.0032 | -0.0021 | 0.0053 | 4.6 |
| AbnormalPMaccruals | -0.0003 | -0.0022 | 0.0019 | 2.0 |