

Do investors trade on the edge? Evidence from insider trades in Vietnam stock market

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Abstract

This study investigates the relationship between insider trading and managerial discretion in the context of the young and fast-growing Vietnam stock market. Using alternative estimates of discretionary accruals quality (DACCR) as proxies for managerial discretion, we find strong evidence that net insider purchase is negatively associated with managerial discretion. This relationship is transformed from a dynamic inverted U-shaped relation between current DACCR and net insider purchase in the preceding year, implying that insider selling behaviour is deliberate in long-term and is supported by accrual abuse. More importantly, we find that net insider purchase is informative about future income-increasing DACCR, but not about future income-decreasing DACCR. Our evidence suggests that insiders adjust their trading behaviour from selling to buying during the two-year period preceding the release of financial information and mislead market about the prospect of the firm. In other words, insiders tend to expropriate on outside investors and avoid legal scrutiny at the same time. We also document a severe measurement error in accruals quality estimation of the balance sheet approach which inflates the value of DACCR estimates and subjects to Type I error. Consequently, our findings insinuate that without access to private information and under poor investor protection, outside investors trade on the edge.

Keyword: discretionary accruals; estimation error; insider trading; managerial discretion; stock market.

1. Introduction

Corporate insiders possess superior inside information about the prospective growth of the firm and use that advantage to engage in opportunistic equity trading. Corporate managers have an advantageous position than ordinary insiders and are able to use their accounting discretion over financial reports to mislead the market. As a result, investors become the victim of information asymmetry and have to bear the risk of firms' opaque financial reporting quality. However, as corporate insiders have the advantage to trade on private information beyond public financial statements of the firms, outside investors can interpret insiders' trading behaviours as signals for future performance and intrinsic value of the firms. Insider purchases convey auspicious signals of the growth or market undervaluation of firms' stocks. On the other hand, market participants seem to interpret insider sales as negative prospects of the firms, and the information content of insider sales is ambiguous in general (Chiang, Chung and Louis, 2017).

Researchers have indicated that there is a significant relation between managerial discretion and insider trading (Beneish and Vargus, 2002; Kothari, Loutskina and Nikolaev, 2006; Sawicki and Shrestha, 2012). Jensen (2005) posits that under performance pressure, corporate managers are likely to manage earnings to meet market expectation. They have the incentive to abuse accrual items and take part in insider trades before financial reports are publicly released (Sawicki and Shrestha, 2012; Tang, Chen and Chang, 2013). As "insiders seem to be able to predict cross-sectional stock returns" (Lakonishok and Lee, 2001, p.79), they can estimate the intrinsic value of the firm and identify temporary market mispricing of their stock. Therefore, insiders can exploit the temporary mispricing and/or manage earnings to mislead the market, thus creating stock mispricing by themselves. In other words, they are not passive players in the stock market. Insiders might trade on their knowledge in a two-year period before the announcement of financial information (Ke, Huddart and Petroni, 2003; Shin and Wang, 2012). However, researchers provide mixed findings on the types of relationship between insider trading and managerial discretion. Beneish and Vargus (2002) and Sawicki and Shrestha (2008) provide strong evidence of a linear relationship between insider trading and managerial discretion and conclude that corporate managers manage earnings upward when selling and manage earnings downward when buying. Kothari et al. (2006)

argue that insider trading – managerial discretion relationship is linear and asymmetrical. The authors indicated that abnormal insider selling occurs in firms with high levels of discretionary accruals while low-accrual firms do not exhibit consistent insider buying or insider selling activity. Sawicki and Shrestha (2012) documented a significant relationship between the quadratic specification of insider trade proxies and accruals concentrated on the selling side, but not on the buying side. The inconsistency in the literature motivates further study on this controversial topic.

Investigating the relationship between insider trading and managerial discretion could improve corporate governance, investor protection and transparency in financial markets, especially in emerging and frontier markets. This study investigates the insider trading–managerial discretion relationship in the young and fast-growing Vietnam stock market which has weak firm-level corporate governance mechanisms (World Bank, 2013), and is regulated in a lax manner by an inexperienced authority (Nguyen, Tran and Zeckhauser, 2017, p.86). The Vietnamese regulatory agencies have been paying increasing attention to illegal insider trades, which abuse private information of listed firms or earnings manipulation, but such activities are still prevalent. As reported by the Vietnam Association of Financial Executives (VAFC) and Vietstock, there are only 16.96% of the listed firms on the Vietnam stock market that fulfilled their financial reporting duties in 2017. This figure was 18.47% in 2016. In 2017, a large number of violations of financial reporting regulations in Vietnam stock market were revealed, resulting in 913 litigations, censures and fines. Besides, late announcements of financial reports are also a common concern of investors in 2017, with approximately 30% of Vietnamese listed firms delaying their quarterly reports and annual reports (Vietstock and VAFC, 2018). The opacity and violations in financial reporting might encourage insiders to take part in opportunistic trades by abusing their information advantages and managerial discretion.

Previous studies proxy managerial discretion using alternatives of accruals estimation including total accruals (Sloan, 1996; Collins, Gong and Hribar, 2003) and discretionary accruals (Subramanyam, 1996; Xie, 2001). As accruals provide information about both growth and managerial discretion, the total accruals cannot adequately reflect earnings management behaviours of corporate managers (Friedlan, 1994). Therefore, recent studies tend to look deeper into the discretionary components of accruals to investigate the managers' discretion over financial reporting quality (Shin and Wang, 2012; Balboa, Lopez and Rubia, 2013; Chowdhury, Mollar and Farooque, 2018).

In general, accruals and accruals components are computed using different approaches, but the balance sheet approach has been the dominant method for estimating accruals in the accounting literature since the 1990s. The most prominent balance sheet methods to estimate accruals are Jones-type models discussed in Jones (1991), Sloan (1996), and Shi and Zhang (2011). However, Dechow and Dichev (2002) prove that Jones-type models might produce biased results when evaluating extreme performing firms. Similarly, Hribar and Collins (2002) argue that conclusions drawn from empirical models that use the accruals estimations computed from balance sheet items are potentially contaminated. These estimations heavily depend on the balance sheet approach's assumptions of the articulation between accrual component of revenues and expense items in the income statement and working capital accounts in the balance sheet (Hribar and Collins, 2002). Hence, it might create a considerable magnitude of accruals estimation and misclassification of accrual-based portfolios.

Accruals can be referred to as the past form of cash collections and/or payments, Dechow and Dichev (2002) take a different perspective in accruals studies by modelling accruals as a function of past, current and future cash flows. This approach can explain the reversal of accruals when cash previously recognised in accruals is paid and/or collected. Dechow and Dichev (2002) suggest that the standard deviation of the residuals from their model can be used as the proxy for earnings quality, or in other

words, managerial discretion in corporate financial reporting. However, their model is unsigned and thus unable to reflect accounting distortions created by managers in long-term discretionary accruals (Dechow, Ge and Schrand, 2010). As an extension of Dechow and Dichev (2002)'s accruals model, Francis, LaFond, Olsson and Schipper (2005) add fixed assets and growth in revenue into the accruals estimation. The authors then decompose the standard deviation of the residuals of their accruals model into innate estimation errors and discretionary estimation errors that enable them to conclude about managerial discretion.

This current study provides new insights into the relationship between insider trading and managerial discretion in the form of discretionary accruals quality. The study considers the presence of insider ownership in its relationship with discretionary accruals as a high level of managerial ownership might insulate managers from shareholder discipline (Huang, Wang and Zhou, 2013). Because managerial ownership is usually endogenous (Gugler and Weigand, 2003), we employ two-step system generalised method of moment regressions to deal with the endogeneity problem in our research models.

Our empirical results indicate that the Net purchase ratio of insiders (Lakonishok and Lee, 2001), hereafter *NPR*, has a significantly negative linear effect on aggregate discretionary accrual quality (*DACCR*). Interestingly, it was transformed from an inverted U-shape *NPR-DACCR* relation in the prior fiscal year, suggesting that insider trading behaviour changes overtime before stock prices are corrected for the information content of discretionary accruals in the preceding and current year. The results also mean that corporate managers might deliberately manipulate earnings downward (upward) to opportunistically purchase (sell) their shares for their benefit.

However, when we decompose *DACCR* into income-decreasing (*negDACCR*) and income-increasing *DACCR* (*posDACCR*), we find a much more complicated nature of the *NPR-DACCR* relationship. We documented the same significant and inverted U-shaped *NPR-posDACCR* relationship for the income-increasing managerial discretion in the prior fiscal year followed by a significantly positive linear *NPR-posDACCR* relationship in the current year. The results imply that insiders have consistent incentives to manage earnings upwards to engage in preplanned insider selling in the previous period. After actively selling, insiders start to purchase stocks again as they "hint" to the market the prospective growth of the firm conveyed in the increasing current accruals. A positive *NPR-DACCR* relationship means that *NPR* increases as *posDACCR* increases, the stock market might be misled about the promising prospects of the firm while it may be not.

On the other hand, the study does not find any significant relationship between *NPR* and *negDACCR*. It shows that insiders might not manage earnings downward to increase their shareholdings. Our findings suggest that, by focusing on incentive-related components of *DACCR*, the relationship between insider trading and managerial discretion is asymmetrical and dynamically complex. The complexity of this relationship cannot be explored if one uses the *aggregate DACCR* as the proxy for managerial discretion.

We found that using the balance sheet approach to estimate accruals might inflate the value of *DACCR* and the standard errors of the coefficients in the regression models with *DACCR* as the dependent variable. In our sample, this inflation is subjected to Type I error when it renders a proxy of insider ownership (*Duality*) statistically insignificant. Under the cash flows statement approach to estimate accruals, *Duality* is significant and allows us to conclude about the influence of insider ownership concentration on managerial discretion. The evidence implies that a lower number of insiders owning shares and higher insider ownership results in higher managerial discretion over financial reporting quality, and vice versa.

Our study contributes to the existing literature in fourfold. First, we prove that insiders in Vietnam stock market not only take advantage of their accessibility to undisclosed financial information but also abuse their managerial discretion over financial reporting quality to benefit themselves in insider trades. Those behaviours might be illegal, and investors become vulnerable while trading on the edge. Second, we provide new findings of the dynamic relationship between insider trading and managerial discretion using two-step system Generalised Method of Moment regressions and capture the complicated and dynamic transitions in insider trading-managerial discretion. We suggest that inside trades are informative about the future discretionary accruals quality as our empirical evidence shows negative and significant U-shaped relationship between one-year lagged insiders' Net Purchase Ratio and discretionary accruals quality. Third, we show that by investigating different designs of discretionary accruals quality, we might capture different aspects and forms of the insider trading-managerial discretion relationship. The inconsistent findings in the literature regarding this relationship (Beneish and Vargus, 2002; Ke et al., 2003; Sawicki and Shrestha, 2012) might be due to their different research designs and approaches. Our evidence shows that by investigating incentive-related managerial discretion, one can conclude that insider trading behaviours change deliberately to buying after selling as a stratagem for winning investors' expectation and avoiding legal scrutiny. Fourth, we find significant estimation errors in the balance sheet estimates of discretionary accruals quality, implying that previous studies in this field should revisit their inferences using cash flows-related accruals measures. Our findings inherit and extend existing literature in this field, and thus are applicable to other equity markets with similar characteristics and investor protection mechanisms.

The remainder of our paper is organized as follows. Section 2 describes the research design and data sample. Section 3 reports and discusses the results. Section 4 concludes the study.

2. Research models and data

2.1. Discretionary accruals quality as the measure of managerial discretion

We follow Francis, LaFond, Olsson and Schipper (2005)'s framework to estimate accruals quality as managerial discretion over financial reporting quality of listed firms. Francis et al. (2005) estimate accruals quality as the 5-year rolling standard deviation of residuals from a regression related total current accruals (TCA) to operating cash flows (OCF) controlled for Property, Plant and Equipment (PPE) and growth in the revenue. The two steps estimation process is given as:

$$TCA_{i,t} = \beta_0 + \beta_1 OCF_{i,t-1} + \beta_2 OCF_{i,t} + \beta_3 OCF_{i,t+1} + \beta_4 \Delta Revenue_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\sigma(\varepsilon_i)_t = \lambda_0 + \lambda_1 \sigma(OCF)_{i,t} + \lambda_2 \sigma(Revenue)_{i,t} + \lambda_3 Size_{i,t} + \lambda_4 \log(OperatingCycle)_{i,t} + \lambda_5 NegEarn_{i,t} + v_{i,t} \quad (2)$$

where $TCA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STDebt_{i,t}$; $OCF_{i,t} = IBXO_{i,t} - TA_{i,t}$, $IBXO$ is net income before extraordinary items while TA account for the total accruals; $TA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STDebt_{i,t} - Dep_{i,t}$, $\Delta CA_{i,t}$ is the changes in current assets of firm i in year t , $\Delta CL_{i,t}$ is the changes in current liabilities of firm i in year t , $\Delta Cash_{i,t}$ is the changes in cash and cash equivalents of firm i in year t , $\Delta STDebt_{i,t}$ is the changes in short term debts of firm i in year t , $Dep_{i,t}$ is Depreciation and Amortization expense retrieved from the Income statement of the firms; $\Delta Revenue_{i,t}$ is the change in Revenue of firm i in 2 consecutive years, $OperatingCycle_{i,t} = DSO_{i,t} + DIO_{i,t} - DPO_{i,t}$, DSO is the Days Sales Outstanding, DIO is Days Inventory Outstanding and DPO is Days Payable Outstanding, $Size_{i,t}$ is the natural log of total assets of firm i in year t , $NegEarn_{i,t}$ is the number of years that firm i reports negative earnings in the 10-year period ended at the end of year t . Francis et al. (2005) introduced the predicted value of $\sigma(\varepsilon_i)_t$, the 5-year rolling standard

deviation of model 1's residual $\varepsilon_{i,t}$, as the measure of accruals quality. The residual $v_{i,t}$ is the estimation errors predicted from $\sigma(\varepsilon)_t$ regression and thus interpreted as the discretionary accruals quality (here after *DACCR*) or in other words - managerial choices.

We make two adjustments to the proxies of Operating Cycle and the dummy variable counting number of year that a firm reports negative earnings. First, we do not take the log of Operating Cycle as in Francis et al. (2005) study, since the log transformation causes missing values in the observations that represent firms with enormous DPO (in other words, negative Operating Cycle), thus partially ignoring part of managerial choices to payables management. We scale the Operating Cycle to 365 as the number of days per year to capture all firm-year observations with negative DPO. Second, we only count the number of financial years that the firms report negative earnings in a consecutive 5-year period instead of a 10-year period as discussed in Francis et al. (2005). This adjustment is to account for young firms or newly listed firms in the last few years in the young and growing Vietnamese equity market.

The calculation of Total accruals (TA) reported in Francis et al. (2005) uses balance sheet items and interpreted OCF from IBXO and TA that can be replaced by the Operating cash flows reported in the Cash flows statement. The difference between Francis et al. (2005)'s balance sheet approach and the Cash flows statement approach is not negligible. Hribar and Collins (2002) found significant estimation errors in the balance sheet accruals estimation, which might adversely impact the previous findings regarding discretionary accruals in the literature. The authors suggested that future research should carefully reevaluate the findings of accruals studies in the literature using other approaches other than the balance sheet approach. Hence, we calculate an alternative measurement of managerial discretion ($v_{i,t}$) using the Cash flows statement approach and name it *DACCR_CF*. We name the residuals estimated from Francis et al. (2005)'s balance sheet approach as *DACCR_BS*. Table 2 shows that the Pearson pairwise correlation between the two proxies is 0.5957, which poses the question regarding the validity of balance sheet accruals quality estimation.

To further investigate the relation between managerial discretion and insider trading, we break down the proxies of managerial discretion into two components: the income-increasing managerial discretion ($DACCR > 0$) and the income-decreasing managerial discretion ($DACCR < 0$). Those proxies examine the asymmetric association in accruals quality and insider trading discussed in Kothari et al. (2006) and Sawicki and Shrestha (2012) study. The authors found consistent evidence that insiders actively participate in insider selling in firms with positively high discretionary accruals. However, they found no evidence of insider trading behaviour in firms with low and negative discretionary accruals. Consequently, the authors concluded that the relation between managerial discretion and insider trading is asymmetric.

To evaluate the participation of insiders in insider trading, we use the *Net Purchase Ratio (NPR)* suggested by Lakonishok and Lee (2001). *NPR* is calculated as the difference between the number of shares purchased and sold by insiders scaled by the total number of shares traded by insiders in the same period.

$$NPR = \frac{\text{Number of share purchased by insiders} - \text{Number of shares sold by insiders}}{\text{Total shares traded by insiders}} \quad (3)$$

Equation (3) is used to demonstrate the trend of insider trading in a period. A positive *NPR* means that insiders participate more in buying relative to selling and vice versa. If *NPR* comes closer to 1.0 or -1.0, then the insider buying/selling activities become dominant.

2.2. Model specifications

Based on the findings of Ke, Huddard and Petroni (2003), and Sawicki and Shrestha (2012), we introduce the following equation to investigate the relationship between managerial discretion and insider trading:

$$DACCR_{i,t} = \alpha_0 + \alpha_1 NPR_{i,t} + \alpha_2 NPR_{i,t-1} + \alpha_3 NPR_{i,t}^2 + \alpha_4 NPR_{i,t-1}^2 + \alpha_5 ISO_{i,t} + \alpha_6 Duality_{i,t} + \alpha_7 Size_{i,t} + \alpha_8 Growth_{i,t} + \alpha_9 Leverage_{i,t} + \alpha_{10} Cashflows_{i,t} + \alpha_{11} BM_{i,t} + \alpha_{12} PE_{i,t} + \varepsilon_{i,t} \quad (4)$$

In equation (4), *DACCR* is the discretionary accruals quality discussed in **Section 2.1**. *DACCR*, or the residual $v_{i,t}$ predicted from $\sigma(\varepsilon)_t$ regressions (equation 1 and 2), is estimated using both Cash flows statement and Balance sheet approach, along with dividing them into proxies for income-increasing and income decreasing managerial discretion. In our study, we use 6 different methods of *DACCR* based on different approaches, including *DACCR* estimated from the balance sheet (*DACCR_BS*); *DACCR* estimated from the cash flows statement (*DACCR_CF*); *DACCR_BS* and *DACCR_CF*'s positive and negative components labelled as *posDACCR_BS*, *negDACCR_BS*, *posDACCR_CF* and *negDACCR_CF*, respectively. The later four methods of *DACCR* provide better insight into income-increasing and income-decreasing managerial discretion over financial reporting quality. To analyze the dynamic relation between *DACCR* and *NPR*, we include *one-year lags of NPR* and *squared NPR* into our research models.

We use two proxies for managerial ownership including insider share ownership (*ISO*) and the number of insiders who own shares (*Duality*). The control variables include natural log of total assets (*Size*), growth in investment in fixed assets (*Growth*), Long-term debt to total assets ratio (*Leverage*), operating cash flows scaled by total assets (*Cashflows*), and book to market ratio (*BM*) as used in Sawicki and Shrestha's (2012) study. In addition, we use Price-to-earnings ratio (*PE*) to control for value firms and growth firms as used by Houmes and Chira (2015).

2.3. Data sample

The data for this study is retrieved from the Bloomberg Terminal provided by Bloomberg Finance L.P. Our sample covers financial reporting and price data of Vietnamese listed firms on Hanoi Stock Exchange and Ho Chi Minh Stock Exchange from January 2006 to December 2017. Managerial ownership and insider trading data for Vietnam stock market are only available on Bloomberg Terminal since 2010. We exclude observations if: (1) the firms are in financial industries according to Bloomberg Industry Classification System; (2) accounting items for calculating accruals are missing; and (3) insider trading data is missing. Collectively, data sample consist of 635 listed firms on the Vietnam stock market in the period from 2006 to 2017.

2.4. Descriptive statistics

Table 1 reports the descriptive statistics of the data sample. The statistics of variables in Equation (1) and (2) are reported in Panel A Panel B reports the descriptive statistics of insider trading activities and managerial ownership. Panel C presents the descriptive statistics of alternative measures of discretionary accruals as proxies for managerial discretion. Panel D reports the descriptive statistics of the control variables discussed in Section 2.2. Table 2 reports the correlation matrix of the variables used in the research models. All accounting items are reported in Vietnamese Dong (VND).

Panel A in Table 1 reports the descriptive statistics for the variables used to compute the discretionary estimation errors as discussed in Francis et al. (2005). The notations used in Panel A are defined as follows: TCA is Total Current Accruals, calculated as changes in current assets minus changes in current liabilities minus changes in cash and cash equivalents, then adding changes in short-term debts in the same period; OpCycle stands for Operating Cycle, calculated as the sum of Day Sales Outstanding (DSO) and Day Inventory Outstanding (DIO) minus Day Payable Outstanding (DPO); NegEarn is the number of years that a firm reports negative earnings; OCF_FLOS is Francis, LaFond, Olsson and Schipper.(2005)'s operating cash flows estimation using the balance sheet approach; OCF is the cash flows from operating activities retrieved from the Cash flows statement; PPE is Property, Plants and Equipment; Δ Revenues measures the year-by-year changes in a firm's revenues.

Panel B in Table 1 provides the descriptive statistics of insider ownership and insider trading activities, including insider share ownership (ISO), number of insiders owning shares (Duality), number of shares purchased by insiders, number of shares sold by insiders, Net Purchase Ratio (NPR) and the square of NPR (NPR^2). Net Purchase Ratio is calculated as the ratio of the difference in the number of shares purchased and sold by insiders and the total shares traded by insiders (Lakonishok and Lee, 2001; Sawicki and Shrestha, 2012).

Panel C in Table 1 presents the discretionary component of accruals, which reflects managerial choices in earning management using both indirect balance sheet approach (DACCR_BS) and cash flows statement approach (DACCR_CF). Those two figures are scaled by total assets. To further investigate the association between managerial discretion and insider trading, DACCR_BS and DACCR_CF are divided into positive and negative components and then tested separately as income-increasing (posDACCR_BS and posDACCR_CF) and income-decreasing discretionary accruals (negDACCR_BS and negDACCR_CF), respectively.

Panel D in Table 1 reports the descriptive statistics for control variables used in this study. Size is the natural logarithm of total assets; Growth stands for the growth of investment in fixed assets; Leverage is the ratio of long-term debts and total assets; Cashflows measures operating cash flows scaled by total assets; BM represents the book-to-market ratio, and PE is the Price-to-Earnings ratio.

Table 1.
Descriptive Statistics.

The table reports descriptive statistics for variables used in the regression models.

Panel A								
Variable	N	Mean	Std.dev	Min	Max	P1	P50	P99
TCA	5230	33175	464599	-10910000	14510000	-980518	5246	1457000
OpCycle	5686	0.57	4.13	-51.27	227.8	-0.35	0.27	5.47
NegEarn	4498	0	1	0	4	0	0	2
OCF_FLOS	5101	118127	736127	-4533000	19590000	-716890	17854	2579000
OCF	5720	108779	675678	-2764000	17800000	-466811	15332	2086000
PPE	5770	469538	1659000	0	26000000	260	78450	8276000
Revenues	5769	1468000	5846000	-20166	207000000	5512	394873	17900000
Δ Revenues	5303	85749	1707000	-60000000	31000000	-2165000	25973	3500000

Panel B

Variable	N	Mean	Std.dev.	Min	Max	P1	P50	P99
ISO (%)	4148	11.3	14.69	0	86.13	0	5.12	64.76
Duality	4148	6.38	3.13	0	18	0	7	14
NPR	4148	-0.03	0.44	-1	1	-1	0	1
NPR ²	4148	0.19	0.39	0	1	0	0	1
Number of shares purchased by insiders	4148	56647	425507	0	10000000	0	0	1367000
Number of shares sold by insiders	4148	70615	572374	0	19600000	0	0	1909000

Panel C

Variable	N	Mean	Std.dev.	Min	Max	P1	P50	P99
DACCR_BS	2324	4.609	81.84	-0.957	2064	-0.17	-0.013	1.211
DACCR_CF	2432	2.036	93.41	-24.26	4587	-2.67	-0.111	0.459
posDACCR_BS	890	12.06	131.5	0	2064	0	0.034	65.55
negDACCR_BS	1434	-0.042	0.056	-0.957	0	-0.23	-0.031	0
posDACCR_CF	481	11.89	208.7	0	4587	0.001	0.038	156.9
negDACCR_CF	1951	-0.41	1.28	-24.26	0	-2.901	-0.171	-0.002

Panel D

Variable	N	Mean	Std.dev.	Min	Max	P1	P50	P99
Size	5771	12.98	1.53	3.65	18.11	9.75	12.9	16.87
Growth	5280	3.03	179.7	-1	13050	-0.96	0.02	8.33
Leverage	5658	0.07	0.12	0	0.76	0	0.01	0.56
Cashflows	5719	0.07	0.16	-0.96	1.92	-0.33	0.06	0.53
BM	5026	1.36	1.02	0	10.16	0.12	1.1	4.88
PE	5026	1058	2499	0.3	61551	5.16	343.3	9862

Table 2. Correlation matrix.

Panel A

Pearson pairwise correlations between independent variables used in the regression models introduced in Section 2.2.

	NPR	Lagged NPR	NPR ²	Lagged NPR ²	ISO	Duality	Size	Growth	Leverage	Cashflows	BM	PE
NPR	1.000											
Lagged NPR	0.099	1.000										
NPR ²	-0.148	-0.011	1.000									
Lagged NPR ²	-0.043	-0.141	0.223	1.000								
ISO	0.062	0.075	0.112	0.094	1.000							
Duality	-0.090	-0.024	0.140	0.147	0.214	1.000						
Size	-0.066	-0.070	0.085	0.116	-0.044	0.198	1.000					
Growth	-0.004	-0.027	-0.011	0.026	-0.021	-0.020	0.002	1.000				
Leverage	0.019	0.010	-0.001	0.001	-0.072	0.047	0.356	0.046	1.000			
Cashflows	-0.017	0.007	-0.011	-0.013	-0.069	-0.002	-0.063	0.029	-0.036	1.000		
BM	0.051	0.039	-0.120	-0.110	0.041	-0.145	-0.110	-0.024	0.009	-0.208	1.000	
PE	-0.024	-0.010	0.018	-0.002	-0.009	-0.054	-0.329	-0.002	-0.166	0.164	-0.184	1.000

Panel B

Pearson pairwise correlations between proxies of managerial discretion as the dependent variables of the regression models introduced in Section 2.2.

	DACCR_BS	DACCR_CF	posDACCR_BS	posDACCR_CF
DACCR_BS	1.000			
DACCR_CF	0.596	1.000		
posDACCR_BS	0.999	0.593	1.000	
posDACCR_CF	0.595	1.000	0.594	1.000

	DACCR_BS	DACCR_CF	negDACCR_BS	negDACCR_CF
DACCR_BS	1.000			
DACCR_CF	0.596	1.000		
negDACCR_BS	0.980	0.513	1.000	
negDACCR_CF	-0.929	0.999	0.567	1.000

On average, the percentage of insider share ownership (*ISO*) in Vietnam stock market is 11.30% from 2010 to 2017. The mean number of insiders owning shares is 6.38. The number of shares sold by insiders is remarkably higher than the number of shares they purchased. The *Net Purchase Ratio (NPR)* is -0.03 on average while its median is 0, suggesting that insiders in Vietnamese listed firms tend to sell more than the amount they acquire on the domestic stock exchanges.

Proxies for managers' income-increasing discretion (*posDACCR_BS* and *posDACCR_CF*) have significantly larger mean and standard deviation in comparison to the proxies of their counterparts (*negDACCR_BS* and *negDACCR_CF*). The mean and standard deviation of *posDACCR_BS* are 12.06 and 131.5 compared to -0.042 and 0.056 of *negDACCR_BS*. On the other hand, the mean and standard deviation of *posDACCR_CF* are 11.89 and 208.7 while *negDACCR_CF*'s mean and standard deviation are -0.41 and 1.28, respectively. These statistics show that the positive components of *DACCR* estimations are not only higher on average but also deviate much more than the negative components of *DACCR* estimations. From these statistics, one can conclude that in Vietnamese listed firms, managerial discretion is more diverse for income-increasing than for income-decreasing incentive. The statistics imply that managers of Vietnamese listed firms have different motivations and levels of engagement in income-increasing managerial discretion while they seem not to be so variant in income-decreasing earnings management. Despite the significantly lower means and standard deviations of negative *DACCR* components, the number of observations which contain negative values of *DACCR* accounts for 61.70% and 80.22% of the total observations under the balance sheet and the cash flows statement estimations of *DACCR*, respectively. In other word, managers of listed firms in Vietnam engage more in income-decreasing earnings management than in income-increasing earnings management, but in a more prudent manner.

The difference between the balance sheet and the cash flows statement approach to discretionary accruals estimation is remarkable. The mean, median and the values of the 1st and 99th percentiles of *DACCR_BS* are noticeably higher than those of *DACCR_CF*. If we compute *DACCR* using the balance sheet approach, the number of observations with negative *DACCR* is only 61.70% of the data sample compared to 80.22% of the cash flows statement approach. It seems that the value of *DACCR* is inflated under the balance sheet approach as argued by Hribar and Collins (2002).

3. Results Discussions

3.1. The relation between managerial discretion and insider trading

Table 3 reports the regression analysis for managerial discretion and insider trading using data of Vietnamese listed firms. Managerial discretion is proxied by discretionary estimation errors from accruals model proposed by Francis et al. (2005) using both balance sheet approach and cash flows statement approach. Insider trading is measured by Net Purchased Ratio (Lakonishok and Lee, 2001; Sawicki and Shrestha, 2012) as the difference between the number of shares purchased and sold by insider scaled by the total number of shares traded by insiders. We also use two variables *ISO* and *Duality* as proxies for managerial ownership to further investigate the managerial discretion – insider trading relation under the effect of managerial ownership in the model (1) and (2). *ISO* (insider share ownership) is the percentage of shares outstanding owned by insiders of the firms. *Duality* represents another aspect of managerial ownership based on the number of insiders owning shares of the firms. By including both *ISO* and *Duality* in the research models, we can capture more information on the concentration or dispersion of insider ownership. The control variables include *Size*, *Growth*, *Leverage*, *BM*, and *PE* are defined in Section 2.2.

We test our model for linear and quadratic specifications of insider trading proxy as suggested by Kothari et al. (2006) and Sawicki and Shrestha (2012). To address the prevalent issue of endogeneity in our panel data, we employed the Durbin-Wu-Hausman (DWH) test and detected endogeneity in *Duality* and the one-year lag of the dependent variable. Therefore, we employ two-step system generalized method of moment (hereafter system GMM) regressors to deal with the endogeneity problem using a set of instrumental variables generate from lags of the endogenous variables. We also add the lags of the dependent variables, *NPR* and *NPR*² to the regression models to further investigate their dynamic relation. The Arellano-Bond test for AR(1) in first difference has p-values of .031 and .001 for Model 1 and 2, respectively. The Arellano-Bond test for AR(2) in first difference has p-values of .105 and .112 for Model 1 and 2, respectively. The p-values indicate that there is no sign of second-order serial correlation in the regression models at 10% significance level. The Hansen test's p-value for Model 1 and 2 are .876 and .743 respectively. Thus the instrument variables are collectively valid in treatment for endogeneity.

Table 3

The relationship between managerial discretion and insider trading activities.

The following table presents the two-step system GMM regression results on the relationship between discretionary accruals quality (*DACCR*) and insider trading activities on the Vietnam stock market over the 2010 to 2017 period. The dependent variables (*DACCR_BS* and *DACCR_CF*) are computed by applying both the balance sheet and the cash flows statement approaches similar to Francis et al.(2005)'s discretionary accruals quality models. Year dummies are not included in the regression models. Lags of dependent variables are not reported. Robust standard errors are reported in parentheses. *, ** and *** denote statistical significance level of .1, .05 and .01, respectively.

VARIABLES	Model (1)	Model (2)
	DACCR_BS	DACCR_CF
NPR	-7.212*** (2.690)	-6.904*** (2.206)
Lagged NPR	-27.75*** (8.137)	-27.49*** (6.026)
NPR ²	-1.951 (2.451)	-1.958 (1.968)
Lagged NPR ²	-14.66** (7.404)	-18.03*** (5.421)
Duality	-0.845 (0.766)	-1.263* (0.762)
ISO	0.170*** (0.0653)	0.193*** (0.0628)
Size	0.428 (0.645)	0.687 (0.557)
Growth	-0.0187 (0.0493)	-0.0177 (0.0439)
Leverage	-0.786 (4.206)	0.228 (4.042)
Cashflows	3.172 (4.018)	3.085 (3.611)
BM	0.292 (0.833)	0.0564 (0.692)
PE	-0.000152 (0.000231)	1.11e-06 (0.000244)
Intercept	0.189	0.414

	(5.989)	(5.107)
Observations	1,308	1,413
AR(1) p-value	0.031	0.001
AR(2) p-value	0.105	0.112
Hansen test p-value	0.876	0.743
Turning point	-0.9507	-0.7623

Table 3 shows negative and significant coefficients in both current and lagged NPR after controlling for managerial ownership and firm characteristics in both Model 1 and 2. The result shows the coefficients of *NPR* and *lagged NPR* in Model 1 and 2 are -7.212 and -6.904 at .01 significance level, respectively. Besides, the coefficients of the quadratic specification of *NPR* in both models are insignificant while the coefficients of their lags are -14.66 and -18.03 at .05 and .01 significance level, respectively. This implies a significant and dynamic inversed association between managerial discretion and net insider purchases. In other words, managers of Vietnamese listed firms have been using their accounting discretion to manage earnings and actively trading firms' shares in *year t* and *year t-1* before the earnings announcement at *year t*. This finding indicates that the *NPR-DACCR* relationship changes from an inverted U-shape in the prior year to negative linear in the current year, which means insider trading behaviour is not constant.

We can conclude that the forecasted discretionary accruals quality increase as insiders sell more on Vietnam stock market until their selling reaches to a specified *NPR* as the turning point, then the forecasted *DACCR* decreases. This association turns into linear in the next period when we estimate the discretionary accruals quality as the proxy for managerial discretion. Based on Kothari et al. (2006) and Dechow and Ge (2006), the nature of accrual items is transitory, and an accruals reversal may be a signal for a reversal in stock returns. If market overvalues firms, managers usually attempt to prolong the overvaluation by inflating earnings to meet market expectation. The portion of accruals manipulated by managers in the previous periods accrues to the current period and adds up to the current accruals. It thus becomes more difficult for managers to manage as it was already publicly reported. As investors can more or less perceive the information content of accruals, the firm's intrinsic performance will be revealed over time. Therefore, insider trading behaviour changes from deliberate sale/purchasing (inverted U-shape *NPR-DACRR* curve) in year *t-1* to active sale/purchasing (negative linear relation) in *year t* as the results indicate.

The coefficients of *ISO* in Model 1 and 2 are positive and significant at .05 and .01 significance level, respectively. This implies that as managers hold more stakes in the Vietnamese listed firms, their discretion over earnings quality grows stronger. Our evidence is consistent with the findings of Huang et al. (2013), which suggest that insiders with higher ownership are more likely to be insulated from shareholder discipline. This finding has implications for developing corporate governance framework in listed firms to strengthen insider trading restrictions and investor protection.

3.2. Asymmetrical relationship between the managerial discretion and insider trading

To investigate the incentives of insider trading in Vietnamese listed firms, we break down the proxies of discretionary accruals quality into income-increasing discretionary accruals quality (*DACCR* > 0)

and income-decreasing discretionary accruals quality (DACCR<0) components. We then regress the components of discretionary accruals quality using the same independent variables as in Model 1 and 2.

The Arellano-Bond test for AR(1) in first difference p-values for Model 3 and 4, are .050 and .056 respectively. The Arellano-Bond test for AR(2) in first difference p-values for Model 3 and 4 are .374 and .189, respectively. The p-values indicate there is no sign of second-order serial correlation in the regression models. The Hansen test's p-value for Model 3 and 4 are .776 and .938, respectively, meaning the instrument variables are collectively valid in treatment for endogeneity. The AR(1), AR(2) and Hansen test's p-values for Model 5 and 6 are .355, .884, .516 and .193, .915, .751, respectively. This indicates that serial correlation is not present in the first and second order, and the instrument variables are considered valid in Model 5 and 6. Our results are thus reliable.

Table 4.

The relationship between managerial discretion and insider trading activities.

The following table presents the two-step system GMM regression results for the discretionary accruals quality on insider trading activities on the Vietnam stock market over the 2010 to 2017 period. The dependent variables are income-increasing and income-decreasing discretionary accruals quality computed from the Balance sheet approach and the Cash flows statement approach as discussed in Section 2. Year dummies are not included in the regression models. Lags of dependent variables are not reported. Robust standard errors are reported in parentheses. *, ** and *** denote statistical significance level of .1, .05 and .01, respectively.

VARIABLES	Model (3)	Model (4)	Model (5)	Model (6)
	posDACCR_BS	posDACCR_CF	negDACCR_BS	negDACCR_CF
NPR	2.956* (1.546)	1.970*** (0.622)	-0.00136 (0.0111)	0.000731 (0.0285)
Lagged NPR	-15.03** (5.795)	-7.238*** (1.772)	0.0288 (0.0958)	-0.0474 (0.165)
NPR ²	3.982 (2.462)	0.944 (1.278)	-0.000547 (0.0199)	-0.00603 (0.0449)
Lagged NPR ²	-20.33*** (3.675)	-4.909** (1.898)	0.0122 (0.0823)	-0.0173 (0.187)
ISO	-2.838 (4.942)	3.379 (3.496)	-0.0212 (0.0327)	0.0293 (0.0910)
Duality	0.487 (0.559)	0.237 (0.391)	0.000504 (0.00217)	0.000720 (0.0157)
Size	-0.0251 (0.280)	-0.150 (0.567)	0.00425 (0.00624)	0.0197 (0.137)
Growth	0.0830 (0.0677)	-0.0189 (0.0264)	-0.000154 (0.000130)	0.00142 (0.00232)
Leverage	6.103 (8.257)	1.309 (1.963)	0.00753 (0.0265)	-0.0573 (0.320)
Cashflows	-1.581 (7.496)	2.008 (4.718)	-0.0625* (0.0321)	-0.0892 (0.125)
BM	-0.627 (0.701)	0.225 (0.472)	-0.00200 (0.00312)	-0.00935 (0.0235)
PE	7.38e-05 (0.000179)	0.00124 (0.00185)	3.78e-06 (4.07e-06)	3.31e-06 (6.97e-06)
Intercept	-0.0934 (3.504)	0.164 (7.081)	-0.0629 (0.0994)	-0.236 (1.823)

Observations	291	186	632	1,025
AR(1) p-value	0.050	0.056	0.355	0.193
AR(2) p-value	0.374	0.189	0.884	0.915
Hansen test p-value	0.766	0.938	0.516	0.751
Turning point	-0.3696	-0.7372		

Table 4 shows the two-step System GMM regression results of Model 3 to 6. Model 3 and 4 report the relationship between income-increasing managerial discretion and insider trading using positive components of *DACCR* computed from the Balance sheet and the Cash flows statement approaches. Model 5 and 6 investigate the relationship between income-decreasing managerial discretion and insider trading using negative components of *DACCR_BS* and *DACCR_CF*. Interestingly, the results suggest that the negatively U-shaped relationship between managerial discretion and insider trading remains significant when we investigate the positive *DACCR* subsample, but not for the subsample with negative *DACCR*. Table 4 shows the coefficients of *lagged NPR*, *lagged quadratic NPR* in Model 3 and 4 are negative and significant. These results are consistent with findings of the Model 1 and 2. However, the *current NPR* in Model 3 and 4 are positive and significant, indicating a robust positive significant relation between insider buying and managerial discretion. Thus, we can document a reversal in managerial discretion - insiders trading relationship after their inverted U-shaped association in the preceding fiscal year. This change implies short-term reactions of insiders to the stock prices, earnings and accruals reversal as discussed by Ke et al. (2003). Ke et al. (2003) and Shin and Wang (2012) suggest that insider selling increases two years prior to a break in consecutive increases in earnings reported by the listed firms. The authors indicated that insiders trade upon their foreknowledge of specific and exclusive accounting disclosure, and avoid regulatory scrutiny risk by ceasing the sale after bad news go public. Our results confirm Ke et al. (2003) and Shin and Wang (2012)'s findings and provide additional evidence on the dynamic relationship between insider trading and managerial discretion.

By managing earnings upward, managers of Vietnamese listed firms tend to maintain market overvaluation of the firms and participate in opportunistic insider selling activities (Sawicki and Shrestha, 2008). On the other hand, managers do not seem to manage earnings downward because of their incentives to buy shares. This evidence implies an asymmetric relationship between managerial discretion and insider trading activities, which is consistent with the findings of Ke et al. (2003), Kothari et al. (2006) and Sawicki and Shrestha (2012). Furthermore, we can conclude that it is possible to use insider selling data in ex-ante to assess the quality of discretionary accruals as suggested by Beneish and Vargus (2002). To be specific, *NPR* and *lagged quadratic NPR* can be used as indicators to evaluate income-increasing managerial discretion as they deliver the incentives of managers to engage in earnings management.

Our results provide new insights into the aspect of insider trading and managerial discretion behaviour compared to the findings from Ke et al. (2003). The fact that the coefficients of current *NPR* are consistently positive and significant in the model 3 and 4 while their lagged specifications are negative, regarding the transitory nature of discretionary accruals, insinuates that insiders can detect when the stock prices are corrected for accumulated discretionary accruals embedded in the current discretionary accruals. After active selling in *year t-1*, insiders start to purchase stocks again in *year t* as they signal to the market the prospective growth of the firms conveyed in the increasing current accruals. By playing this gimmick, insiders can attract attention to their stock and avoid legal scrutiny (Ke et al., 2003; Shin and

Wang, 2012). However, as the accruals imply both growth and managerial discretion (Friedlan, 1994), it is not an easy task for investors to perceive the tangled information content of accruals provided by the firms. Those who can interpret the information and differentiate between growth and managerial discretion might always be one step behind as insiders have the advantage to trade prior to the announcement date of the financial information. In other words, the cycle continues to roll on, and outside investors trade on the edge.

3.3. Balance sheet approach versus Cash flows statement approach

From Table 3 and 4, we can conclude that the *DACCR* measurements computed from balance sheet and cash flows statement are robust, but their robust standard errors derive further implication for the estimation of managerial discretion over accruals. Specifically, the robust standard errors of all coefficients in Model 2 are remarkably lower than those in Model 1. After breaking down *DACCR_BS* and *DACCR_CF* into positive and negative components, we still document that the robust standard errors of variables in model 4 are considerably lower than the robust standard errors of variables in model 3. These findings imply that the estimation of accruals quality from the cash flows statement approach yields more reliable interpretations than accruals quality estimation from the balance sheet approach.

Furthermore, *Duality* has a significant coefficient at .1 significance level in Model 2 and appears to be insignificant in Model 1. The difference between the standard errors of *Duality* in Model 1 and 2 is small (0.766 compared to 0.762). However, that difference is essential as the cash flows statement provides a more precise estimation of accruals than that of the balance sheet (Hribar and Collins, 2002). The balance sheet estimation of *DACCR* (*DACCR_BS*) inflates the standard errors of the variables in our regression models and thus reducing the test statistics. As a result, the power of the test decreases and the result interpretations are subjected to Type I error. The significance of the coefficient of *Duality* is of importance because it allows us to make conclusions about how insider ownership concentration influences the discretionary accruals quality. To be specific, the coefficient of *Duality* is negative and significant in Model 2 with *DACCR_CF* as the dependent variable. Combining with the positive significance of *ISO* in Model 2, we can conclude that if insider ownership concentrates on fewer insiders and/or insider ownership increases, the managerial discretion grows stronger. This statement is rejected under the balance sheet approach to *DACCR* in Model 1.

Our findings are consistent with Hribar and Collins (2002) and Shi & Zhang (2011). According to Hribar and Collins (2002), researchers who use balance sheet approach to study accruals may not find statistically significant results due to the estimation errors of balance sheet accruals estimation. Shi and Zhang (2011) extend Hribar and Collins (2002)'s findings by further investigating the determinants of the difference between the balance sheet accruals estimations and cash flows statement accruals estimations. Shi and Zhang (2011) then concluded that the estimation error between the two alternative measurements of accruals is significant and determined by special accrual items¹, non-articulation items and non-articulation in changes in working capital accounts between the accrual-basis and cash-basis financial statements.

We determined the turning point of the quadratic relationship between managerial discretion and lagged *NPR*. In Table 3, the results show the balance sheet approach to *DACCR* generates a turning

¹ According to Shi and Zhang (2011), the special accrual items include Deferred income tax, Equity in net earnings/losses, Gains/losses from sale of PPE and Investments, and Other funds from operations.

point at *lagged NPR* equals $-.9507$, indicating *DACCR* reverses at a dominant level of insider selling. However, it seems that the *DACCR* reversal comes sooner under Cash flows statement approach, *with lagged NPR* equals $-.7623$. In Table 4, the difference in the turning point of *DACCR* between the two approaches widens in the opposite direction. The turning point calculated for Model 3 (under Balance sheet approach) is at *lagged NPR* equals $-.3696$. The results from Model 4 indicate a turning point at *lagged NPR* equals $-.7372$ which approximates that of Model 2 under the same cash flows statement approach. Although the Pearson pairwise correlation between *DACCR_BS* and *posDACCR_BS* is $.9997$ (see Table 2) close to the perfect correlation, the turning points of their U-shaped *DACCR-NPR* curves are surprisingly inconsistent.

From there, one can state that there is a severe measurement error in accruals quality estimation of the balance sheet approach as discussed by Hribar and Collins (2002), and Shi and Zhang (2011).

3.4. Robustness check

We estimated *DACCR* using both the balance sheet and cash flows statement approach to total accruals on Francis et al. (2005)'s discretionary accruals quality. The difference between the two estimations is mostly due to special accrual items, non-articulation items and non-articulation in changes in working capital accounts in the balance sheet and cash flows statement (Shi and Zhang, 2011). After regressing Model 1 and 2, we conduct further investigation on more specified components of *DACCR* as the proxies for managerial discretion's incentives in Model 3 to 6. The regression results of those models posit that our inferences are consistent by different estimations of *DACCR*. To be specific, *ISO*, *NPR*, *NPR*² and their lags specifications have consistently negative and significant coefficients in both Model 1 and 2 at .05 and .01 significance level. In Model 3 and 4, we document the same changes in the relationship insider trading behaviour (*NPR*, *NPR*² and their lagged specifications) and income-increasing managerial discretion (*posDACCR*) in the two-year period before the announcement of financial information. The coefficients of *NPR* remain positive and significant in both Model 3 and 4 while their lagged quadratic specification' coefficients stay negative and significant by both *posDACCR* estimation approach. Conversely, we do not find any evidence of that relationship between the insider trading behaviour (*NPR*, *NPR*² and their lagged specifications) and income-decreasing managerial discretion (*negDACCR*) by both *negDACCR* estimation approaches in Model 5 and 6. Therefore, our inferences remain robust to alternative estimations of *DACCR* and managerial earnings management incentives.

Despite that statistical tests based on two-step estimators are asymptotically more powerful than those based on one-step estimators, the efficiency gain of two-step GMM estimators may not always be materialised in finite samples (Hwang and Sun, 2018). Hence, we employ one-step system GMM regressions to check the robustness of our findings generated from the two-step system GMM regressions. Eventually, the results of six empirical models using one-step system GMM are consistent with those reported in Section 3.1 and 3.2. Thus the validity of our inferences is confirmed.

Table 5

Robustness check using one-step system GMM regression with alternative estimations and components of *DACCR*

The following table presents the one-step GMM regression results for the discretionary accruals quality on insider trading activities on the Vietnam stock market over the 2010 to 2017 period. Year dummies are not included in the regression models. Lags of dependent variables are not reported. Robust standard errors are reported in parentheses. *, ** and *** denote statistical significance level of .1, .05 and .01, respectively.

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	One-step	One-step	One-step	One-step	One-step	One-step
	GMM	GMM	GMM	GMM	GMM	GMM
	<i>DACCR_BS</i>	<i>DACCR_CF</i>	<i>posDACCR_BS</i>	<i>posDACCR_CF</i>	<i>negDACCR_BS</i>	<i>negDACCR_CF</i>
NPR	-7.419** (2.972)	-6.867*** (2.184)	2.905* (1.547)	2.047*** (0.595)	0.00515 (0.00841)	-0.0537 (0.0590)
Lagged NPR	-28.31*** (8.797)	-27.12*** (6.021)	-7.916 (9.967)	-7.387*** (1.798)	-0.0786 (0.0864)	0.204 (0.399)
NPR ²	-2.047 (2.526)	-1.942 (1.951)	3.885 (2.409)	1.354 (1.323)	0.0125 (0.0143)	0.0256 (0.146)
Lagged NPR ²	-14.79** (7.358)	-17.57*** (5.494)	-25.24*** (9.490)	-4.037** (1.940)	-0.0359 (0.0630)	-0.0645 (0.388)
Duality	-0.864 (0.775)	-1.264* (0.763)	1.037 (1.021)	0.157 (0.380)	-1.58e-05 (0.00205)	-0.00897 (0.0338)
ISO	17.41** (6.959)	19.19*** (6.280)	-5.247 (6.164)	2.718 (3.612)	0.00562 (0.0300)	-0.0176 (0.153)
Size	0.429 (0.638)	0.671 (0.555)	-0.209 (0.446)	-0.300 (0.567)	-0.00190 (0.00608)	0.00879 (0.223)
Growth	-0.0201 (0.0501)	-0.0195 (0.0446)	0.145 (0.117)	-0.0274 (0.0252)	-0.000267** (0.000121)	0.00226 (0.00290)
Leverage	-0.785 (4.204)	0.248 (4.044)	9.658 (8.191)	2.640 (2.284)	0.0184 (0.0230)	0.0104 (0.687)
Cashflows	3.194 (4.033)	3.000 (3.635)	-4.103 (10.90)	2.488 (4.417)	-0.0509 (0.0345)	-0.127 (0.130)
BM	0.299 (0.831)	0.0571 (0.688)	-1.182 (1.240)	0.193 (0.493)	-0.00272 (0.00279)	-0.0368 (0.0576)
PE	-0.000157 (0.000232)	-3.08e-06 (0.000244)	0.000137 (0.000194)	0.00156 (0.00177)	2.44e-07 (4.41e-06)	2.20e-07 (1.56e-05)
Intercept	0.2782054 (5.976504)	0.5700162 (5.094689)	1.253947 (4.420329)	2.618229 (7.202878)	0.0355068 (0.0942209)	0.0344249 (2.89452)
Observations	1,308	1,413	291	186	632	1,025
Number of unit	444	452	142	70	257	374
AR(1) p-value	0.042	0.001	0.082	0.049	0.245	0.211
AR(2) p-value	0.108	0.111	0.381	0.190	0.957	0.643
Hansen test p-value	0.876	0.743	0.766	0.877	0.547	0.661

4. Conclusion

We examine the insider trading behaviour in the Vietnamese stock market in its relation to managerial discretion over financial reporting quality. The empirical results indicate that NPR and one-year lagged NPR have significant and negative impacts on the aggregate DACCR, suggesting that corporate managers might manipulate earnings to benefit in opportunistic insider trades. In general, insiders take advantage of their superior disclosure to insider information and exercise opportunistic trades before the financial information is reported to investors.

When breaking down *DACCR* into income-increasing and income-decreasing discretion components, we document that the lagged *NPR* is negatively associated with income-increasing *DACCR* while there is no statistically significant evidence of the relation between *NPR* and income-decreasing *DACCR*. These findings illustrate an asymmetrical *NPR-DACCR* relation regarding managers' incentives to engage in earnings management. We posit that insider trading behaviour is not constant but changes and complicated. The evidence suggests that insiders know when the market corrects stock prices for accumulated discretionary accruals embedded in the current discretionary accruals. Consequently, insiders deliberately sell their stocks in *year t-1* and come back to purchase shares again as they signal to the market the prospective growth of the firm conveyed in the increasing current accruals in *year t*. We further show that the information content of insider trades can be used as an ex-ante assessment to accruals quality and managerial incentives for earnings management in Vietnam stock market.

We also insinuate that using the balance sheet approach to estimate *DACCR* induce significant estimation errors that might render explanatory variables statistically insignificant while they are likely not. In the spirit of Hribar and Collins (2002), we suggest previous studies, which use the balance sheet approach to accruals estimations to revisit their inferences using alternative cash flows-related accruals estimations. Other differences in this field of studies might be due to the differences in research designs and the use of incentive-related proxies of accruals quality. Hence, there is abundant room for future studies to re-evaluate the findings from previous research based on the balance sheet accruals estimations.

By incorporating different research designs from Beneish and Vargus (2002), Ke et al. (2003), and Sawicki and Shrestha (2012), we captured the dynamical and transitory nature of the insider trading-managerial relationship. This contributes to the literature as an interference of the mixed findings in the literature regarding the insider trading-managerial relationship (Ke et al., 2003; Kothari et al., 2006; Sawicki and Shrestha, 2012).

Overall, we provide evidence that insider trading behaviour is informative about managerial discretion and investors who lack insider information are likely to trade on the edge. A wait-see-and-respond attitude is not enough for investors to deal with the risk they have to bear while trading. Our analysis shows that insider trading data is a crucial key to understanding the gimmick likely to be used by insiders. It also offers a detailed explanation for the tangled linkage between insider trading and managerial discretion in frontier and emerging markets. As firms and investors in stock markets are vulnerable to insider trading in general, our implications might be applicable to other frontier and emerging markets which have similar characteristics and with poor investor protection.

References

Balboa, M., Lopez, G.E., and Rubia, A. (2013). Nonlinear dynamics in discretionary accruals: An analysis of bank loan-loss provisions. *Journal of Banking and Finance*, 37(12), 5186-5207.

Beneish, M.D., Vargus, M. (2002). Insider trading, earnings quality and accrual mispricing. *The Accounting Review*, 77, 755-791.

Chiang, C.H., Chung, S.G. & Louis, H. (2017). Insider trading, stock return volatility, and the option market's pricing of the information content of insider trading. *Journal of Finance and Banking*, 76, 65-73.

Chowdhury, A., Mollar, S., and Farooque, O.A. (2018). Insider trading, discretionary accruals and information asymmetry. *The British Accounting Review*, 50(4), 341-363.

Collins, D.W., Gong, G., and Hribar, P. (2003). Investor sophistication and the mispricing of accruals. *Review of Accounting Studies*, 8, 251-276.

Dechow, P.M., Dichev, I.D. (2002). The quality of accruals and earnings: The role of accruals estimation errors. *The Accounting Review*, 77, Supplement: Quality of Earnings Conference, 35-59.

Dechow, P.M., Ge, W., Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50, 344-401.

Francis, J. LaFond, R., Olsson, P., Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics*, 39, 295-327.

Friedlan, J.M. (1994). Accounting choices of issuers of initial public offerings. *Contemporary Accounting Research*, 11, 1 – 31. Gugler, K. and Weigand, J. (2003). Is ownership really endogenous?. *Applied Economics Letters*, 10, 483-6.

Houmes, R., & Chira, I. (2015). The effect of ownership structure on the price earnings ratio-return anomaly. *International Review of Financial Analysis*, 37, 140-147.

Hribar, P., Collisions, D.W. (2002). Errors in estimating accruals: Implications for Empirical Research. *Journal of Accounting Research*, 40(1), 105-134.

Huang, H.H., Wang, W. and Zhou, J. (2013). Shareholder rights, insider ownership and earnings management. *Abacus*, 49(1), 46-73

Hwang, J., and Sun, Y. (2018). Should we go one step further? An accurate comparison of one-step and two-step procedures in a generalized method of moments framework. *Journal of Econometrics*, 207(2), 381-405.

Jensen, M.C. (2005). Agency costs of overvalued equity. *Financial Management*, 10, 549-565.

Jones, J.J. (1991). Earning management during import relief investigations. *Journal of Accounting Research*, 29, 193-228.

Jones, K.L., Krishnan, G.V., Melendrez, K.D. (2008). Do models of discretionary accruals detect actual cases of fraudulent and restated earnings? An empirical analysis. *Contemporary Accounting Research*, 25(2), 499-531.

Ke, B., Huddart, S., Petroni, K. (2003). What insiders know about future earnings and how they use it: Evidence from insider trades. *Journal of Accounting and Economics*, 35, 315-346.

Kothari, S.P., Loutskina, E., Nikolaev, V. (2006). Agency theory of overvalued equity as an explanation for the accrual anomaly. Working paper.

Lakonishok, J., Lee, I. (2001). Are insider trades informative? *Review of Financial Studies*, 14(1), 79-111.

Nguyen, V., Tran, A. and Zeckhauser, R. (2017). Stock split to profit insider trading: Lessons from an emerging market. *Journal of International Money and Finance*, 74, 69-87.

Sawicki, J., Shrestha, K. (2008). Insider Trading and Earnings Management. *Journal of Business Finance and Accounting*, 35(3), 331-346.

Sawicki, J., Shrestha, K. (2012). Overvalued Equity and the Accruals Anomaly: Evidence from Insider Trades. *Procedia Economics and Finance*, 2, 91-100.

Shi, L., Zhang, H. (2011). On alternative measures of accruals. *Accounting Horizons*, 25(4), 811-836.

Shin, Y. and Wang, W. (2012). Discretionary accruals, insider trading, and the break of good earnings strings. *Journal of Business and Economic Studies*, 18(2), 26-91.

Sloan, R. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, 71, 289-315.

Subramanyam, K.R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics*, 22(1), 249-281.

Tang, H., Chen, A., Chang, C. (2013). Insider trading, accrual abuse, and corporate governance in emerging markets – Evidence from Taiwan. *Pacific-Basin Finance Journal*, 24, 132-155.

Vietstock and Vietnam Association of Financial Executives (2018). Survey on Financial reporting quality on Vietnam Stock Market. Retrieved from <http://vafe.org.vn/download/BAO%20CAO%20KHAO%20SAT%20CONG%20BO%20THONG%20TIN%20017%20VIETSTOCK%20FILI-Final.pdf>

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