The Information Content of Indirect Insider Trading:
Empirical Evidence from Vietnam Security Market

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Abstract

In this paper, we discuss the relationship among indirect insider trading, opportunistic trading and investment horizon in Vietnam security market. Goldie, Jiang, Koch and Wintoki [10] find that in order to camouflage opportunistic trading, insiders trade through the accounts of family members, trusts, and foundations, known as indirect insider trading. According to Cohen, Malloy and Pomorski [5], opportunistic trading are strong predictors of future return. Akbas, Jiang, and Koch [1] document that the performance of short-horizon insiders to forecast future stock prices are better than that of long-horizon insiders since SH insiders are more likely to be unexpected, on average, when compared with the typical expected trade of LH insiders. Empirical results show that the impact of opportunistic trades in indirect insider trading on future return is stronger than that in direct insider trading. In indirect insider trading, the impact of opportunistic trades on future return is still stronger than that of routine trades. Moreover, we find that the impact of short-horizon insiders in indirect insider trading on future return is stronger than that in direct insider trading. In indirect insider trading, the impact of short-horizon insiders on future return is still stronger than that of long-horizon insiders.

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1. Introduction

Insider trading usually involves the use of superior information for trading by outsiders because insiders possess more information about their firms than outside shareholders. Although insider sales do not always communicate unfavorable information, since sales may meet the liquidity needs of insiders, insider purchases convey positive information about a firm's prospect. There are some studies showing that the indirect insider trading affects future return [16] [2] [5] [8] [1].

Indirect trades are the trading transaction that occurs if the accounts are from the family members. Indirect trades are more likely to be associated with insiders from firms that are smaller, and have a higher book-to-market ratio, lower profits, more volatile stock prices, and lower institutional ownership. There are four theoretical rationales to consider when it comes to higher proportion of informed trading through indirect accounts: Indirect accounts represent one way to camouflage opportunistic insider trading, indirect sales are more likely to contain negative information, insiders who use their information advantage to build wealth, either for themselves or for eventual bequests, may trade through indirect accounts to minimize the impact of personal, estate, or gift taxes, and lastly, consider indirect trades made through family accounts in particular [10].

Opportunistic insider trading is a transactions made by insiders without an obvious discernible pattern in the past timing of their trades. According to Cohen, et al. [5], a portfolio strategy that focuses solely on the trades made by opportunistic traders earns large and significant returns. The reason of outperformance of opportunistic insider trading on future returns is because informed investors tend to disguise their activity by trading when liquidity is high and by splitting large orders into smaller trades, which make them more like an opportunistic trader. Focusing only on the trades of opportunistic traders can weed out uninformative signals and identify set of information-rich trades that are powerful predictors of future firm returns, news, and events. The returns to the opportunistic trades tend to rise following the opportunistic trading month, and then level off, exhibiting no future reversal. In this paper, we explore whether the impact of opportunistic trades with indirect insider trading on future return is stronger than that with direct insider trading. Moreover, during indirect insider trading, we explore whether the impact of opportunistic trades on future return is still stronger than that of routine trades.

By continuing this persistent, expected pattern of either buying or selling, the long-horizon (LH) insiders reveal that their motivations to trade has not changed, and is unlikely to be related to material information. On the contrary, short-horizon (SH) insider focus more on short-term information flows that let them switch between buying and selling more frequently, in order to realize trading profits immediately. Akbas, et al. [1] find that SH insiders earn significantly higher returns than LH insiders for up to twelve months following their trades, both when they buy and when they sell. In an efficient market, the information content of insider trades should depend on the degree to which the trades are unexpected. Thus, the typical trade by SH insiders tends to be more informative since it is more likely to be

unexpected, on average, when compared with the typical expected trade of LH insiders. In this paper, we explore whether the impact of short horizon insiders with indirect insider trading on future return is stronger than that with direct insider trading. In addition, we examine whether the impact of short horizon insiders on future return is still stronger than that of long horizon insiders during indirect insider trading.

The remainder of this paper is organized as follows: Section 2 reviews the literature and develops testable hypotheses, Section 3 describes the data and variable definition, and Sector 4 presents the empirical results. Section 5 then concludes with a summary of the findings and outlines directions for future research.

2. Literature Review and Hypothesis

2.1 Literature review

2.1.1 Insider trading

Corporate managers and directors have access to better information that outsiders do about their firm's prospect. Because of this advantage, the Securities and Exchange Commission (SEC) has regulated insider trading in the United States since 1934 [6]. Insider trading is a trading activity that involves trading in public company's stock by someone who has non-public, material information about that stock for any reason that is not driven by information, including a desire for liquidity, diversification, or corporate control. The merits of insider trading have been debated on two levels: Whether if it's "fair" to have trading when individuals are differently informed, and whether if it's economically efficient to allow inside trading [12].

Insider trading usually involves the use of superior information for trading by outsiders because insiders possess more information about their firms than outside shareholders. Although insider sales do not always communicate unfavorable information, since sales may meet the liquidity needs of insiders, insider purchases convey positive information about a firm's prospect. Following insiders' purchases, positive abnormal returns are found by several studies. Insiders sell stock following periods of positive abnormal returns and buy after periods of negative abnormal returns [13]. The behavior of stock returns around the trades of company directors at any frequency is interesting for two reasons: First, the extent to which insiders trade profitably on private information to generate abnormal returns would be a violation of strong-form market efficiency. The second reason concerns whether outside investors can mimic the actions of insiders to also earn abnormal returns [7]. A negative relation between quality of information and return to information processing therefore implies a positive relation between variance of abnormal returns and return to information processing [14]. There are abnormal returns associated with the merger announcements and hence an evidence for insider trading taking place around the event date [15].

2.1.2   Indirect insider trading

Indirect insider trading is insider trading that is made in the accounts of family members, trusts, retirement accounts, and foundations. There are four theoretical rationales to consider when it comes to higher proportion of informed trading through indirect accounts: Indirect accounts represent one way to camouflage opportunistic insider trading, indirect sales are more likely to contain negative information, insiders who use their information advantage to build wealth, either for themselves or for eventual bequests, may trade through indirect accounts to minimize the impact of personal, estate, or gift taxes, and lastly, consider indirect trades made through family accounts in particular [10].

The likelihood of opportunistic insider trade should be positively associated with the degree of information asymmetry and the informational price efficiency. Opportunistic insider trading captures a reverse pattern in abnormal returns around an opportunistic insider trade. In particular, one should observe a negative abnormal return prior to an opportunistic insider stock purchase and positive abnormal return subsequently [16]. Opportunistic insiders earn higher returns on their future trades. No return predictability emerges on the sell side either on non-opportunistic insiders or for all insiders. The question is raised whether the return predictability associated with opportunistic insiders is driven by firm characteristics unrelated to opportunism. Opportunistic trading is a much stronger and more robust predictor of future returns, even on the sell side, and dominates the non-routineness measure in predicting returns [2].

2.1.3   Opportunistic trading

According to empirical results on the study from Cohen et al. [5], the number of opportunistic buys, opportunistic sells, routine buys and routine sells are all essentially uncorrelated with each other. Both opportunistic buys and opportunistic sells are strong predictors of future returns, while routine buys and sells are not. A portfolio strategy that focuses solely on the trades made by opportunistic traders earns large and significant returns, while a strategy that follows the trades of routine traders does not. In general, opportunistic trades seem to predict shorter-term news events, as opposed to long-term firm-level measures like annual employment or inventory changes. The number of opportunistic trades by local insiders is positively related to the total number of firm-level information events in the following month. The local insiders who are not senior management are the one whose opportunistic trades predict future information events. The more geographically concentrated a firm is, the more likely the insider is to be a local non-senior who trades opportunistically. It is plausible that opportunistic traders might be especially sensitive to the potential costs and penalties associated with illegal insider trading.

2.1.4   Investment horizon

By spreading both the costs and benefits of ownership over a long period, long-horizon institutional investors have a comparative advantage in effectively monitoring managers [9] [4]. On the other hand, short-horizon institutional investors are more likely to increase the information of stock prices, because they are better informed than long-horizon institutions and trade actively to exploit their informational advantages [18]. Shareholder investment horizons are negatively correlated with the proportion of opportunistic insider trades. For instance, long horizon shareholders can increase information disclosure regarding future earnings, which in turn diminishes insiders' informational advantages and results in fewer pre-earnings announcement trades [8].

According to Akbas, et al. [1], the two key variables that display the largest (absolute) correlation with investment horizon are firm size and stock return volatility. SH insiders outperform LH insiders for both purchases and sales. The performance of hedge portfolios that duplicate the strong purchases and strong sales of both LH and SH insiders is substantially greater if the focus is on small firms. In the analysis of long run trading performance, it provides strong evidence that SH insiders earn significantly higher returns than LH insiders for up to twelve months following their trades, both when they buy and when they sell. In an efficient market, the information content of insider trades should depend on the degree to which the trades are unexpected. The two groups of insider trades that are most unexpected are sales made by LH buyers and purchases made by LH sellers. A shorter investment horizon for the firm's insiders is associated with significantly greater earnings management and less R&D expenditure. Insiders have access to information about forthcoming earnings well before the public release of this information. When insiders exploit private information by trading ahead of major events in this fashion, they face litigation risk.

2.1.5   Vietnamese market

Since 1990, the Vietnamese financial system has made steady progress towards what is required for a market-based economy. The banking sector has grown significantly in terms of both structure and services. Foreign banks have also been allowed to enter and operate in Vietnam and by September 1995, the number of foreign bank branches and representative offices had increased to about 20 and 60 respectively [11]. In addition, Vietnam was far from being a financially independent country. However, during this period, Vietnam attracted significant FDI which could be attributed to promulgation of a liberal foreign investment law in 1987. In recent years, FDI inflows have played an important role, not only in providing investment capital, but also in stimulating export growth [17].

It is interesting to note that the Vietnamese economy has expanded since 2000 by an annual average growth rate of 7% (from 6.8% in 2000 to 7.7% in 2004, and to 8.5% in 2007). The gross domestic saving rate also rose steadily from 31.7% in 2000 to 32.0% in 2004 and to over 35.0% in 2007. In addition, the annual average

growth rate of M2 was approximately 25% during 2000-2007 (IMF 2008). Although the banking sector has grown dramatically since 1990, it still has many problems. The main problem faced by the banking sector is the high percentage of nonperforming loans. As of the end of 1997, the total overdue loans were estimated at US$610 million. Of this total, almost 75% was held by SOCBs and 33% was owed by SOEs. The private sector's share of overdue loans rose to 67% in 1997 from 41% in 1994 (ADB 2003). However, the problem has improved since 2000. The ratio of overdue loans to total loans has declined from 9.7% in 2000 to 8.5% in 2002 and 3.2% in 2006 (IMF 2008). It is perhaps also worth mentioning that the Vietnamese financial system consists primarily of the banking sector [3].

2.2   Hypothesis

According to Goldie et al. [10], different groups of indirect trades continue to significantly outperform direct trades, after controlling for trade size and firm characteristics. This outperformance of indirect trades is more persistent than the direct ones and does not reverse over long periods. Indirect trades contain information that is more predictive than direct trades about future quarterly earnings surprises and larger price changes. Indirect trades are more likely to be linked with insiders from smaller firms, and have a higher book-to-market ratio, lower profits, more volatile stock prices, and lower institutional ownership. There are four theoretical rationales for expecting a higher proportion of informed trading through indirect accounts relative to direct accounts. First, indirect accounts represent one way to camouflage opportunistic insider trading. Second, indirect sales are more likely to contain negative information than direct sales, because insiders are less likely to make uninformed sales through indirect accounts to achieve diversification or liquidity. Third, insiders who use their information advantage to build wealth, either directly for themselves or for eventual bequests, may trade through indirect accounts to minimize the impact of personal, estate, or gift taxes. Fourth, consider indirect trades made through family accounts in particular.

According to Cohen et al. [5], routine traders are defined as insiders who place trades in the same calendar month for at least a certain number of years in the past, while opportunistic traders are defined as those insiders without obvious discernible patterns in the past timing of their trades. Focusing only on the trades of opportunistic traders can weed out uninformative signals and we can identify set of information-rich trades that are powerful predictors of future firm returns, news, and events. Opportunistic traders have the most predictability for future firm events. The returns to the opportunistic trades tend to rise following the opportunistic trading month, and then level off, exhibiting no future reversal. It appears that the information being conveyed through the trades of opportunistic insiders has lasting implications for firm values. The above statements should be also suitable in indirect insider trading because indirect insider traders tend to be well-informed about the price changes and future earnings, just like direct traders, who also have significant predictive ability for future returns.

Based on the above reasoning, the following hypotheses can be proposed.

H1a: The impact of opportunistic trades with indirect insider trading on future return is stronger than that with direct insider trading.

H1b: In indirect insider trading, the impact of opportunistic trades on future return is still stronger than that of routine trades.

According to Akbas et al. [1], SH insiders are more likely to be more informative because SH insiders are more unexpected. SH insiders appear to focus more on dynamic short-term information flows that are more compelling to them in order to switch between buying and selling in a frequent manner. LH insiders maintain a focus on long-term trading goals, while SH insiders are more likely to be interested in short-term objectives. The average purchases and sales of SH insiders are more informative about future stock returns, compared with the analogous trades of LH insiders. Thus, SH insiders can realize trading profits in a timely manner. SH insiders contain more predictive informative about future returns.

The above statement is still suitable in indirect insider trading because indirect traders are expected to have a higher proportion of trading that are more well informed. Indirect trades are more likely to be made by insiders who trade profitably prior to earnings announcements, or have a short investment horizon.

From the foregoing, we propose the following hypotheses:

H2a: The impact of short horizon insiders with indirect insider trading on future return is stronger than that with direct insider trading

H2b: In indirect insider trading, the impact of short horizon insiders on future return is still stronger than that of long horizon insiders.

3. Data and Variable Definition

3.1 Data

The data of insider trading are collected from CAFEF (Vietnam's leading financial-trading-securities information center), which shows the announcements from SSC (State Securities Commission) in a short time with a high accuracy. We use the sample of monthly data from 2010 to 2018. The reason why we use these data is their data are arranged by the name of the insiders, insiders' position, insiders' relation. We collect from VNDIRECT Securities Corporation, which is one of a large stock exchange in Vietnam and then match them with each stock in suitable period.

3.2 Variable definition

3.2.1 Purchase ratio

There are three formula of purchase ratio we use, such as: Share Purchase Ratio, Number Purchase Ratio and Buyer Dummy Variable.

We use the amount of shares of account type k purchased (SP) and the amount of shares of account type k sold (SS) by insider i at firm j and in month t to calculate the difference between purchase and sale (SP – SS) and divide it with the total share volume by all investors in firm j during month t (SP + SS). The Share Purchase Ratio is:

$$Share\_Purchase\_Ratiok_{i,j,t} = \frac{SP_{k,i,j,t} - SS_{k,i,j,t}}{SP_{k,i,j,t} + SS_{k,i,j,t}} \tag{1}$$

We use the amount of type k's net purchases (NP) and the amount of type k's net sales (NS) by insider i at firm j in month t to calculate the difference between purchase and sale (NP – NS) and divide it with the total share volume by all investors in firm j during month t (NP + NS). The Number Purchase Ratio is:

$$Number\_Purchase\_Ratiok_{i,j,t} = \frac{NP_{k,i,j,t} - NS_{k,i,j,t}}{NP_{k,i,j,t} + NS_{k,i,j,t}} \tag{2}$$

We identify the dummy variable (Buyer), which is equal to one if $SP_{it} > SS_{it}$, and zero otherwise.

3.2.2 Opportunistic firm

We designate all trades as either opportunistic trades or routine trades at the beginning of each calendar year, based on their past history of trades, and then look how they trade from that point onward. If the trades have no discernible pattern, we define them as opportunistic trades. Nonetheless, if the trades are placed in the same calendar month for at least a certain number of years in the past, we define them as routine trades. If the number of opportunistic trades is greater (smaller) than that of routine trades in a given firm, we regard them as an opportunistic (routine) firm.

3.2.3 Investment Horizon firm

According to Akbas et al. [1], the investment horizon (*HOR*) of an insider is defined as average annual net insider order flow over the calendar years. The definition of *HOR* is as follows:

$$HOR_{i,j,t} = \left| \frac{IOF_{i,j,t}}{N} \right| * (-1) \tag{3}$$

where $IOF_{i,j,t}$ is the annual net insider order flow of insider *i* at firm *j* in year *t*, defined as $\frac{P_{i,j,t} - S_{i,j,t}}{P_{i,j,t} + S_{i,j,t}}$, where P is the number of shares purchased in year *t*, S is the number of shares sold in year *t*, and N is the number of calendar years the insider traded.

Insiders whose purchases and sales do not offset each other over time have a larger average absolute net order imbalance per year, and thus have a longer investment horizon (i.e., *HOR* is closer to −1). In contrast, insiders whose purchases and sales more closely offset each other over time have a smaller average absolute net order imbalance per year, and thus have a shorter investment horizon (i.e., *HOR* is closer

to 0). If the investment horizon of insider is greater (smaller) than the median of investment horizon of all the insiders, we define them as a long (short) investment-horizon insider. In addition, if the number of long investment-horizon insider is greater (smaller) than that of short one in a given firm, we regard them as a long (short) investment-horizon firm.

3.3   The frequency of opportunistic and horizon insider

Table 1 shows that mean of Buyer dummy variable, mean of SPR is -0.055 and mean of NPR is -0.080 is 0.461, which indicates that the number and share of buyer are smaller than those of sellers. The mean of I is 0.217, which implies that the percentage of indirect insider is 21.7%, whereas direct insider is 78.3%. The mean of O is 0.956, which implies that the percentage of opportunistic insider is 95.6%, whereas routine insider is 4.4%.

Table 1: Summary statistic

	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Sum	N
AR	0.028	0.010	1.162	-0.875	0.258	0.422	70.636	2528
SPR	-0.055	-0.125	1	-1	0.919	0.102	-138.992	2528
NPR	-0.080	0	1	-1	0.865	0.154	-201	2528
Buyer	0.461	0	1	0	0.499	0.157	1165	2528
I	0.217	0	1	0	0.412	1.375	548	2528
O	0.956	1	1	0	0.206	-4.429	2416	2528
HOR	-0.523	-0.563	-0.013	-1	0.309	0.233	-1322.442	2528
LNBM	1.461	1.512	2.234	-0.715	0.407	-1.410	3694.043	2528
LNMC	4.626	4.536	9.341	0.489	1.577	0.224	11695.29	2528
PR	0.216	0.131	2.957	-0.835	0.448	1.119	546.686	2528

In Table 2, the correlation matrix shows that AR is positively correlated with I (0.016), which implies that greater number of indirect insider trading are associated with higher abnormal return. SPR is positively correlated with NPR (0.943), Buyer (0.955), which indicates that three variables of purchase ratio are positive correlated. I is negatively correlated with SPR(-0.146), NPR(-0.164), and Buyer (-0.138), which implies that the indirect insiders are inclined to sell stocks. O is positively correlated with HOR (0.040), which indicates that the investment horizon of opportunistic insider are inclined to be short.

Table 2: Correlation matrix

	AR	SPR	NPR	BUYER	I	O	HOR	LNBM	LNMC	PR
AR	1.000									
SPR	-0.016	1.000								
NPR	-0.023	0.943	1.000							
BUYER	-0.008	0.955	0.867	1.000						
I	0.016	-0.146	-0.164	-0.138	1.000					
O	-0.008	0.026	0.011	0.018	-0.003	1.000				
HOR	-0.042	0.147	0.157	0.127	-0.033	0.040	1.000			
LNBM	-0.222	-0.068	-0.064	-0.061	0.024	-0.034	0.003	1.000		
LNMC	-0.198	-0.087	-0.081	-0.077	0.025	-0.055	-0.024	0.947	1.000	
PR	0.015	-0.072	-0.091	-0.062	0.081	-0.052	-0.078	0.093	0.091	1.000

Table 3 presents that in Vietnam stock market, the percentage of opportunistic insider trading, indirect insider trading and the percentage of short horizon insiders, is 96%, 22% and 45% respectively. We can conclude that Vietnam firm has a relatively high frequency of opportunistic insider trading and the number of short horizon insiders is slightly smaller than that of long horizon insiders.

Table 3: Insider trading frequency

Month to measure insider trading	Indirect	Opportunistic	Short Horizon
6	22%	96%	45%

4. Empirical Results

4.1   Indirect insider trading and opportunistic trades

In order to investigate whether the effect of opportunistic trades with indirect insider trading on future return is stronger than that with direct insider trading, we use the firm's abnormal return as the dependent variable to run the following regressions.

$$AR = \alpha + \beta_1 SPR + \beta_2 I * SPR + \beta_3 O * SPR + \beta_4 I * O * SPR + Control\ Variables + \varepsilon_{it} \quad (4)$$

$$AR = \alpha + \beta_1 NPR + \beta_2 I * NPR + \beta_3 O * NPR + \beta_4 I * O * NPR + Control\ Variables + \varepsilon_{it} \quad (5)$$

$$AR = \alpha + \beta_1 Buyer + \beta_2 I * Buyer + \beta_3 O * Buyer + \beta_4 I * O * Buyer + Control\ Variables + \varepsilon_{it} \quad (6)$$

where AR is the future one-month market-adjusted abnormal return for the firm of insider. SPR is the share purchase ratio. NPR is the number purchase ratio. Buyer is a dummy variable, which is equal to one if $SP_{it} > SS_{it}$, and zero otherwise. I is a dummy variable, which is equal to one, if the number of indirect insider trading in firm i in month t is higher than the number of direct insider. O is a dummy variable, which is equal to one, if the number of opportunistic insider trading in firm i in month t is higher than the number of routine insider. Control variables include B/M ratio, market capitalization and the return of the stock.

The impact of opportunistic trades with indirect insider trading on future return is β1+β2+β3+β4 and the impact of opportunistic trades with direct insider trading on future return is β1+β3. If │β1+β2+β3+β4│-│β1+β3│ is positive, we can accept H1a. Moreover, in indirect insider trading, the impact of opportunistic trades on future return is β1+β2+β3+β4 and the impact of routine trades on future return is β1+β2. If │β1+β2+β3+β4│-│β1+β2│ is positive, we can accept H1b.

In Model 1 of Panel A of Table 4, based on the empirical results of SPR, we find that │β1+β2+β3+β4│-│β1+β3│= 0.0028 > 0, indicating that H1a is slightly supported. Similarly, we also find that │β1+β2+β3+β4│-│β1+β2│= 0.1176 > 0, indicating that H1b is slightly supported.

Table 4: Indirect insider trading and opportunistic trades

Panel A: SPR		
Variable	**Model 1**	**Model 2**
SPR	0.0157 (0.8791)	-0.0090 (0.9290)
I*SPR	0.1104 (0.611)	0.0721 (0.7337)
O*SPR	-0.0270 (0.7942)	-0.0062 (0.9508)
I*O*SPR	-0.1076 (0.6272)	-0.0723 (0.7382)
LNBM		-0.2038 (0.0000)
LNMC		0.0165 (0.0963)
PR		0.0191 (0.0917)
Constant	0.0110 (0.5562)	0.2274 (0.0000)
Adjusted R-Squared	-0.0007	0.0502
Panel B: NPR		
Variable	**Model 1**	**Model 2**
NPR	-0.0655 (0.5279)	-0.0608 (0.5473)
I*NPR	-0.1728 (0.4423)	-0.0946 (0.6664)
O*NPR	0.0543 (0.6078)	0.0490 (0.6340)
I*O*NPR	0.1759 (0.4425)	0.1051 (0.6383)
LNBM		-0.2038 (0.0000)
LNMC		0.0165 (0.0963)
PR		0.0191 (0.0917)
Constant	0.0110 (0.5562)	0.2274 (0.0000)
Adjusted R-Squared	-0.0007	0.0502

Panel C: Buyer		
Variable	Model 1	Model 2
BUYER	0.0172 (0.7832)	0.0415 (0.4987)
I*BUYER	0.3192 (0.0503)	0.2680 (0.0917)
O*BUYER	0.0159 (0.7680)	-0.0074 (0.8886)
I*O*BUYER	-0.3190 (0.0536)	-0.2628 (0.1029)
LNBM		-0.2038 (0.0000)
LNMC		0.0165 (0.0963)
PR		0.0191 (0.0917)
Constant	0.0110 (0.5562)	0.2274 (0.0000)
Adjusted R-Squared	-0.0007	0.0502

According to the empirical results of NPR in Model 1 of Panel B, we find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta3| = 0.0031 > 0$, indicating that H1a is slightly supported. We also find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta2| = 0.2302 > 0$, indicating that H1b is slightly supported. Based on the empirical results of Buyer in Model 1 of Panel C, we find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta3| = 0.0002 > 0$, indicating that H1a is slightly supported. Similarly, we also find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta2| = 0.3031 > 0$, indicating that H1b is slightly supported.

After we include control variables, based on the empirical results of SPR in Model 2 of Panel A, we find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta3| = 0.0002 > 0$, indicating that H1a is slightly supported. Similarly, we also find that $(|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta2| = 0.0477 > 0$, indicating that H1b is slightly supported. Based on the empirical results of NPR in Model 2 of Panel B, we find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta3| = 0.0090 > 0$, indicating that H1a is slightly supported. We also find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta2| = 0.1526 > 0$, indicating that H1b is slightly supported. Based on the empirical results of Buyer in Model 2 of Panel C, we find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta3| = 0.0052 > 0$, indicating that H1a is slightly supported. Likewise, we also find that $|\beta1+\beta2+\beta3+\beta4| - |\beta1+\beta2| = 0.2702 > 0$, indicating that H1b is slightly supported.

The findings show that the hypothesis 1a and 1b are slightly supported in Vietnam's security market. These results are also supported with Cohen et al. [5], which indicated that for potential firm activities, opportunistic traders have the most predictability. After the opportunistic trading month, returns to opportunistic trade

appear to increase and then level off, showing no potential reversal. In indirect insider trading, this argument happens because indirect insider traders, like direct traders, who often have considerable predictive potential for future returns, appear to be well-informed about market movements and future earnings.

4.2   Indirect insider trading and investment horizon insider

In order to investigate whether the effect of insider horizon on future return in indirect insider trading is stronger than that in direct insider trading, we use the firm's abnormal return as the dependent variable to run the following regressions.

$$AR = \alpha + \beta_1 SPR + \beta_2 I * SPR + \beta_3 HOR * SPR + \beta_4 I * HOR * SPR + Control\ Variables + \varepsilon_{it} \qquad (7)$$

$$AR = \alpha + \beta_1 NPR + \beta_2 I * NPR + \beta_3 HOR * NPR + \beta_4 I * HOR * NPR + Control\ Variables + \varepsilon_{it} \qquad (8)$$

$$AR = \alpha + \beta_1 Buyer + \beta_2 I * Buyer + \beta_3 HOR * Buyer + \beta_4 I * HOR * Buyer + Control\ Variables + \varepsilon_{it}$$
$$(9)$$

where AR is the future one-month market-adjusted abnormal return for the firm of insider. SPR is the share purchase ratio. NPR is the number purchase ratio. Buyer is a dummy variable, which is equal to one if $SP_{it} > SS_{it}$, and zero otherwise. I is a dummy variable, which is equal to one, if the number of indirect insider trading in firm i in month t is higher than the number of direct insider, and zero otherwise. HOR is a dummy variable, which is equal to one, if firm i is belong to short investment-horizon firm in month t, and zero otherwise. Control variables include B/M ratio, market capitalization and the return of the stock.

The impact of short horizon trades in indirect insider trading on future return is β1+β2+β3+β4 and the impact of short horizon trades in direct insider trading on future return is β1+β3. If │β1+β2+β3+β4│-│β1+β3│ is positive, we can accept H2a. In indirect insider trading, the impact of short horizon trades on future return is β1+β2+β3+β4 and the impact of long horizon trades on future return is β1+β2. If │β1+β2+β3+β4│-│β1+β2│is positive, we can accept H2b.

In Model 1 of Panel A of Table 5, based on the empirical results of SPR, we find that │β1+β2+β3+β4│-│β1+β3│= 0.1846 > 0, indicating that H2a is slightly supported. We also find that │β1+β2+β3+β4│-│β1+β2│= 0.3023 > 0, indicating that H2b is slightly supported. According to the empirical results of NPR in Panel B, we find that │β1+β2+β3+β4│-│β1+β3│= 0.3044 > 0, indicating that H2a is slightly supported. Similarly, we also find that │β1+β2+β3+β4│-│β1+β2│= 0.2838 > 0, indicating that H2b is slightly supported. Based on the empirical results of Buyer in Panel C, we find that │β1+β2+β3+β4│-│β1+β3│= 0.0579 > 0, indicating that H2a is slightly supported. Likewise, we also find that │β1+β2+β3+β4│-│β1+β2│= 0.0714 > 0, indicating that H2b is slightly supported.

Table 5: Indirect insider trading and investment horizon insider

Panel A: SPR		
Variable	Model 1	Model 2
SPR	0.0796 (0.1010)	0.0654 (0.1670)
I*SPR	0.0543 (0.4883)	0.0440 (0.5640)
HOR*SPR	0.1720 (0.0143)	0.1559 (0.0229)
I*HOR*SPR	0.1303 (0.3301)	0.1166 (0.3717)
LNBM		-0.1966 (0.0000)
LNMC		0.0148 (0.1338)
PR		0.0175 (0.1214)
Constant	0.0099 (0.5966)	0.2240 (0.0000)
Adjusted R-Squared	0.0044	0.0541
Panel B: NPR		
Variable	Model 1	Model 2
NPR	-0.0498 (0.2174)	-0.0525 (0.1822)
I*NPR	-0.0961 (0.2098)	-0.0851 (0.2549)
HOR*NPR	-0.0755 (0.2631)	-0.0802 (0.2231)
I*HOR*NPR	-0.2083 (0.1132)	-0.2017 (0.1157)
LNBM		-0.1966 (0.0000)
LNMC		0.0148 (0.1338)
PR		0.0175 (0.1214)
Constant	0.0099 (0.5966)	0.2240 (0.0000)
Adjusted R-Squared	0.0044	0.0541

Panel C: Buyer		
Variable	Model 1	Model 2
BUYER	-0.0256 (0.5423)	-0.0161 (0.6938)
I*BUYER	0.0320 (0.5164)	0.0391 (0.4158)
HOR*BUYER	-0.1101 (0.0040)	-0.0970 (0.0097)
I*HOR*BUYER	0.0259 (0.7581)	0.0307 (0.7080)
LNBM		-0.1966 (0.0000)
LNMC		0.0148 (0.1338)
PR		0.0175 (0.1214)
Constant	0.0099 (0.5966)	0.2240 (0.0000)
Adjusted R-Squared	0.0044	0.0541

After we include control variables, based on the empirical results of Model 2 of SPR in Panel A, we find that $|β1+β2+β3+β4| - |β1+β3| = 0.1606 > 0$, indicating that H2a is slightly supported. We also find that $|β1+β2+β3+β4| - |β1+β2| = 0.2725 > 0$, indicating that H2b is slightly supported. According to the empirical results of NPR in Panel B, we find that $|β1+β2+β3+β4| - |β1+β3| = 0.2868 > 0$, indicating that H2a is slightly supported. Similarly, we also find that $|β1+β2+β3+β4| - |β1+β2| = 0.2819 > 0$, indicating that H2b is slightly supported. Based on the empirical results of Buyer in Panel C, we find that $|β1+β2+β3+β4| - |β1+β3| = 0.0698 > 0$, indicating that H2a is slightly supported. Likewise, we also find that $|β1+β2+β3+β4| - |β1+β2| = 0.0203 > 0$, indicating that H2b is slightly supported. The findings show that the hypothesis 2a and 2b are approved in Vietnam's security market. These results are in line with Akbas, et al. [1], which stated that SH insiders' average purchases and transactions are more insightful about potential stock returns compared to LH insiders' comparable trades.

5. Conclusion

In this paper, we use 100 stocks in Vietnam security market as a sample to test the hypothesis about indirect insiders. We find that the impact of opportunistic trades with indirect insider trading on future return is stronger than that with direct insider trading and in indirect insider trading, the impact of opportunistic trades on future return is still stronger than that of routine trades. Moreover, we find that the impact of short horizon insiders with indirect insider trading on future return is stronger

than that with direct insider trading and in indirect insider trading, the impact of short horizon insiders on future return is still stronger than that of long horizon insiders.

Because we directly collect the data of Vietnam security market from the website instead of downloading the data from database, there might be some inaccuracies and unavoidable errors that occur. Since we only test the data for eight years, we can get more accurate estimation if we have a longer period of data.

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Appendix: Variable Definition

Variable	Definition
AR	Calculating monthly abnormal return of each stock by taking the net value of monthly return and monthly market return of VNI index. Then calculating the cumulative abnormal return over month $t+1$ to $t+6$
SPR	The insider's share purchase ratio for firm i in month t which calculated as: $SPR_{it} = (SP_{it} - SS_{it}) / (SP_{it} + SS_{it})$ where SP_{it} and SS_{it} are the total number of shares purchased and sold by the firm I's insiders in month t.
NPR	The firm i's number purchase ratio in month t which defined as: $NPR_{it} = (NP_{it} - NS_{it}) / (NP_{it} + NS_{it})$ where NP_{it} and NS_{it} are the total number of insider purchases and sales of firm I's stock in month t.
Buyer	The Dummy variable $Buyer_{it}$ for stock I in month t which is equal to one if $SP_{it} > SS_{it}$, and zero otherwise.
I	Insider trading that is made in the accounts of family members, trusts, retirement accounts, and foundations.
O	Opportunistic insider trading that captures a reverse pattern in abnormal returns.
HOR	Investment horizon that correlated with firm size and stock return volatility.
LNBM	Book to market ratio, the natural log of the ratio of the book value of equity to the market value of equity. Market value M is price times share outstanding at the end of December of $t+1$.
LNMC	Market capitalization, the natural log of price times number of shares outstanding at the end of the month.
PR	The return of stock from month $t-11$ to month $t+1$.