THE PRESENCE OF OPPORTUNISTIC INSIDER TRADING: THE CASE OF CANADA

By

Andrii Oleksandrenko

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Supervisor: Professor Ádám Zawadowski

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Abstract

This thesis studies the opportunism among corporate insiders in Canada from 2003 to 2018. I use the methodology proposed by Ali and Hirshleifer, which looks at the profitability of insiders' trades prior to quarterly earnings announcements (QEAs). I use a calendar-time portfolio approach and monthly abnormal returns to measure the performance of the insiders' trades. The results suggest that the return on pre-QEA trades does not identify opportunistic insiders. I also investigate if the opportunism of the corporate insiders depends on their role in the organization. The data indicates that only trades by the managers of the company generate consistent and statistically significant abnormal returns. Furthermore, the opportunistic insider trading is more common in the small and medium-sized companies.

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1. Introduction

Investors and regulators constantly monitor the security market in search of events that can provide valuable information. Investors' objective is to determine the fair value of a security. Regulators, on the one hand, have to maintain "fair and efficient capital markets".[1] One type of information that can be particularly difficult to extract information from is the trades made by the corporate insiders. Having access to non-public information about the company, opportunistic insiders[2] can signal to the market about future prospects of the company through their trades.

In this thesis, I examine the opportunism among corporate insiders in Canada from 2003 to 2018. I use the methodology, proposed by Ali and Hirshleifer (2017), that looks at the profitability of insiders' trades prior to quarterly earnings announcements (QEAs).

An insider is a special type of traders. By definition, they have access to the information about the company, which is not public. According to the Ontario Security Act (OSA) Section 1, a director or officer of a reporting issuer or its subsidiaries, or anyone (including issuer himself) with more than 10% of the voting rights attached to all the reporting issuer's outstanding voting securities, is qualified as an insider[3]. Corporate insiders may use their superior position to earn abnormal return from their trades. However, they are also the subject to scrutiny by regulators[4], as well as to internal company policy.

Corporate insiders can have different reasons to buy or sell their company stocks:

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[1] From the Ontario Securities Commission website: http://www.osc.gov.on.ca/en/About_about_index.htm
[2] Through this thesis, I will refer to "opportunistic insiders", meaning insiders whose trades yield substantial abnormal return and can be used to identify future price movements of the stocks.
[3] Ontario Securities Act, R.S.O. 1990, c. S.5, § 1 (1)
[4] Ontario Securities Act, R.S.O. 1990, c. S.5, § 21

1. Diversification and liquidity motives. During recent decades the stock-based compensation for the management has been increasing. Nittai et al. (2007), using US data, showed that per-employee option grants are highly correlated with the stock market valuation. Through initial ownership, stock grants, and other marketable securities corporate insiders can have a significant share of their wealth in company equity. Thus, diversification and liquidity motives, along with regulation requirements, may affect the timing of their trades, making it difficult for investors to extract information from the trades. Moreover, companies usually require their managers to hold a minimum number of stocks, which makes the process even more difficult.

2. Information availability. Information possessed by insiders about the company may vary significantly from time to time. As a result, it is not clear what is an appropriate time horizon for identifying opportunistic insiders. Ke et al. (2003) report that stock sales by insiders increase three to nine quarters prior to a break in a progression of consecutive increases in quarterly earnings. The authors also shows that insider sales are differ in magnitude between companies, depending on their size.

3. Company specific incentives. According to Cohen et al. (2012) insiders are more likely to buy stocks, since they often receive discount plans on their company equity.

All above make the process of extraction of the information from insiders' trades difficult. Ali and Hirshleifer's framework is intended to overcome some of the difficulties in identifying opportunistic insiders. The methodology includes the following steps: at the beginning of each year insiders are split into quintiles, based on the profitability of their previous pre-QEA trades; using a calendar-time portfolio approach, the long and short strategies for each quintile are constructed; the returns on portfolios are compared.

The idea of ranking insider on the profitability of their pre-QEA trades is based on the concept that market regulators can scrutinize insider trading during pre-QEA period especially heavily.

Given the risk of investigation, opportunistic insiders trade prior to the QEAs most often when they expect to earn especially high return, which would compensate for the risk of potential enforcement actions. As a result, the profitability of pre-QEA trades can be a good proxy for the opportunism. However, there is no reason to think that trading in pre-QEA periods by itself is a sign of illegitimate behavior. The idea is that insiders, who yield high return on their pre-QEA trades are opportunistic.[5]

The findings in this thesis suggest that profitability of pre-QEA trades does not identify the opportunism of the corporate insiders. The results are not consistent with the applied framework and most of the estimates are not statistically significant.

Another results presented in this thesis is that insider's buys yield positive abnormal return, while insider's sells do not. This results are consistent with the existing literature literature (Lakonishok and Lee, 2001, Metrick, Zeckhauser, and Jeng 2003). Furthermore, the data suggest that the opportunistic insider trading is more common in the small and medium-sized companies.

The results, presented in this thesis, are limited due to the following reasons. First, only companies with at least three years of the stock price history are in the sample[6]. Second, data issues i.e. McNally and Smith (2010) report that in 2006 over 10% of insider trading reports in Canada contain errors.

This thesis contributes to the existing literature by applying existing methodology to a new dataset and exploring other factors, which can indicate opportunistic behavior among corporate

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[5] The profitability of the pre-QEA trades is only a proxy for the opportunism of the insiders. Corporate insiders may trade on the non-public information, which have a long lasting effect on the stock price and will not materialize in the nearest earnings statement. Thus, opportunistic insiders can leverage their information at any other time, not necessarily prior to the QEA date.

[6] Three years of the stock prices data is required in order to calculate the CAPM's betas.

insiders. To my knowledge, there is no any paper, which would try to identify opportunistic insiders, using Canadian data for 2003-2018.

The structure of the thesis is as follows. In Chapter 2 I first outline the differences in the insider trading regulations in Canada and the United States and then review the existing literature on insider trading. In Chapter 3 I describe the data used in this thesis. Chapter 4 introduces the steps for implementation of Ali and Hirshleifer's framework, investigates the opportunism among corporate insiders according to their role in the organization, and presents the results. In Chapter 5 I summarize my findings and conclude.

2. Context

2.1. Insider Trading Regulation in Canada and the US

Since most papers in the literature studying insider trading focus on the US security market, it is important to outline the similarities and differences between the Canadian and the American insider trading regulations. Canadian stock exchanges are within top ten in the world by the market capitalization[7] but the number of insider trading cases initiated by Canadian authorities are disproportionately small in comparison to those in the US. Bhattacharya (2006) reports that from 1995 to 2005 the U.S. Security and Exchange Commission (SEC) initiated 391 insider trading cases (5.84 insider trading cases per 1000 firms); at the same time the Ontario Securities Commission (OSC) initiated 11 (0.3 insider trading cases per 1000 firms).

Insider trading in the Canada is regulated by the Ontario Securities Act (OSA), while in the US it is SEC Rule 10b5-1. Thomson (2013) details that the two documents are similar in many aspects, e.g. both standards determine the knowledge of non-public information as adequate in imposing insider trading liability, allow corporate insiders to "protect" themselves by using binding contracts to trade securities, and induce companies to implement internal procedures to prevent illegitimate behavior. However, the two sets of regulations differ in their formulation of insider trading liability. The SEC relies on the breach of the fiduciary duty, whereas OSA requires the flow of the information from insider to the trader, as well as, their awareness of the source of the information. The time limit for reporting insider trades also differs: ten and two days in Canada and the US respectively.

Summing up, the insider trading regulations in both countries share a similar approach but the results of its implementation are different. One example is the case of Richard Moore in 2010,

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[7] The World Federation of Exchanges: Monthly Reports (December 2017)

when for same transactions he was charged for the violation of the insider trading rules in the US but did not face any prosecution in Canada[8].

2.2. Literature Review

Some theoretical papers on insider trading focus on developing a model that would describe the interaction between insiders and regulators or find a way to identify insiders, who leverage their monopoly power over the information. For example, Smales and Thul (2017), using sequential game-theoretical model, showed that costly investigation and low penalties incentivize opportunistic insider trading. Kyle (1985) presented that the strategic exercise of monopoly power by an insider is consistent with prices being set efficiently in the semi-strong form.

In Canada, as well as in many other countries, after any transaction which leads to a change in the ownership of the security, insiders have to fill out an online form specifying the amount and price of shares they bought or sold. This information then becomes public. Investors, regulators, and researches try to evaluate it for signs of unlawful behavior or to get a hint about companies' perspectives. Not surprisingly, the availability of the data and the public interest led to a significant empirical literature on this topic.

Many papers study the forecasting ability of insider trades, aggregated at the firm level. For example, Lakonishok and Lee (2001), Metrick, Zeckhauser, and Jeng (2003) showed that only insider buys predict the future abnormal return on the stock. A possible explanation is that insiders, having fiduciary duty to the shareholders, have less chances to face legal prosecution from the investors if they bought before the price increases than if they sold before it decreases. This is because in the second case, investors lost on their investments, whereas in the first case,

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[8] Source: http://business.financialpost.com/legal-post/how-the-sec-and-the-osc-differ-in-their-approaches-to-trading-offences

they only had unrealized gains. Eckbo and Smith (2002) and Gębka et al. (2017) did not find any predictive power in either buys or sells by insiders.

Martin and Oliver (2008) reported that at the individual stock level insiders' purchases peak one month before a large jump in the stock price while insiders' sales peak many month before a large drop. They argue that rational uninformed investor may react more strongly to the absence of the insider selling than to its presence.

Cohen et al. (2012) look at the insiders' consistency in timing their trades. They found that a portfolio strategy that focuses on the insiders who trade in different months from year to year yields a value-weighted abnormal return of 0.82% per month, while the abnormal return of other insiders is around zero. Alldredge and Cicero (2015) provided evidence that some profitable insider selling are based on the public information, arguing that insiders are more attentive in analyzing new information about their company than outside investors.

Ofek and Yermack (2000) find that stock-based compensation succeeds in increasing incentives for low-ownership management, whereas high-ownership managers reverse much of its impact by selling previously owned shares. Jenter (2005) reports that managers have contrarian views on the firm value relative to the market valuation. He show that the low valuation companies are regarded as undervalued by their managers compare to the high valuation companies.

In this thesis, I use the framework proposed by Ali and Hirshleifer (2017). Using the US data, they show that opportunistic insiders can be identified by looking on the profitability of their pre-QEA trades. They report that a value-weighted trading portfolio based on the trades of opportunistic insiders earns monthly four-factor alphas of over 1%.

As for the papers that investigate insider trading in Canada, McNally and Smith (2003) report a widespread violation of OSC's regulations regarding insider trading. Brian and Smith (2003)

report that corporate insiders show great timing in trading their stocks. They also show that outside directors earn the highest abnormal returns before selling and avoid losses by timing their sells, viz. 50% abnormal returns and avoid abnormal losses of -9% following their sales over the two years period.

3. Data

The data for this thesis come from several sources. The main data on insider trades come from the Thomson Reuters insider filling database, which includes trades by corporate insiders in Canada from Jun 2003 to March 2018. According to Section 107 of the OSA, insiders must file a report disclosing any change in the direct or indirect beneficial ownership of a related financial instrument within ten days of the transaction. The process is organized through the System for Electronic Disclosure by Insiders, known as SEDI[9], the electronic system for filing and publicly disseminating insider trading reports. The data contains a unique identifier for every company, the name and position of the insider, the transaction date, price, and quantity. I focus on the open market acquisition and disposition by insiders, and therefore I excluded options and warrants exercises and private transactions by insiders.

The earnings announcement and the index data were also downloaded from the Thomson Reuters. I used the value-weighted S&P/TSX Composite Total Return index[10]. Since there were many missing values for earning announcement dates in the data from the Thomson Reuters, I additionally scraped the announcement dates from the TMX Group website[11]. TMX Group is a Canadian financial services company, which operates Toronto Stock Exchange and TSX Venture Exchange. After merging and cleaning two datasets I got rid of those company-years in which a companies were filling more than four earning releases. In most cases it was because firms were reporting as two separate entities, e.g. in the period 2011- 2015 Bce Inc was filling earning releases as itself and as Manitoba Telecom Services Inc. It reduced the available earnings releases data by 4.7%.

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[9] https://www.sedi.ca/sedi/
[10] Through this thesis, I will refer to index, market interchangeably, meaning S&P/TSX Composite Total Return index, unless other stated.
[11] https://web.tmxmoney.com/earnings_cal.php

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For calculating the stocks' returns, I scraped the historical stock prices data from the Yahoo Finance website[12], which provides dividend adjusted stock prices data. I focused on the common stocks, listed on the Toronto Stock Exchange and the TSX Venture Exchange. As a risk-free rate I took the one-month Canadian Treasury bill rate (data from the Federal Reserve Economic Data website).[13]

I used the Capital Asset Pricing Model (CAPM) to measure abnormal returns on the insiders' trades. The CAPM was introduced in the 1960s by J. Mossin (1966), J. Lintner (1965 a, b), W. Sharpe (1964), and J. Treynor (1962). It provides a framework to measure the asset's sensitivity to non-diversifiable risk (also known as a market or systemic risk), often represented by beta (β) in the financial literature, and has the following form:

$$r_{i,t}^e = \alpha_i + \beta_i \cdot r_{m,t}^e + \varepsilon_{i,t},$$

where

$r_{i,t}^e$ − stock excess return;

$r_{m,t}^e$ − market excess return;

β_i − sensitivity of a securities' return i to the market risk;

α_i − securities' abnormal return ($E[\alpha_i] = 0$);

$\varepsilon_{i,t}$ − idiosyncratic or firm-specific risk ($E[\varepsilon_i] = 0$).

CAPM requires some simplifying assumptions about investors, e.g. homogeneous expectations, no transaction costs, investors are price takers and they are rational with mean-variance utility, etc. Fama and French (1993) showed that the CAPM model does not explain market anomalies like value and size effects. I did not find a reliable source with the factors to

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[12] https://finance.yahoo.com/
[13] https://fred.stlouisfed.org/series/INTGSTCAM193N

adjust for the value and size effects for Canada, but the CAPM framework should be enough to answer the question of this thesis.

Using the CAPM, monthly stock and market excess returns for the previous 3 years, I calculated betas for each company for each month. Having betas, I then calculated the daily and monthly abnormal returns for every sock in the database:

$$\alpha_{i,t} = r_{i,t}^e - \beta_{i,t} \cdot r_{m,t}^e,$$

where $r_{i,t}^e$ is the company i's excess return during t's time period, $r_{m,t}^e$ is the market excess return at time t, and $\beta_{i,t}$ is the company i's beta for the t's month.

In order to get rid of some extreme changes in the stock prices and focused on price movements, caused by the changes in the company's fundamentals, I excluded company-months with the average stock price below CAD 10, the trading volume below CAD 100,000, or the absolute value of the company's excess return above 200%.

4. Model Overview

4.1. Main Estimates

To identify opportunistic insiders I use the framework proposed by Ali and Hirshleifer (2017) that looks at the profitability of pre-quarterly earnings announcements (QEAs) trades, made by insiders. They claim that trading by the corporate insiders before the earnings announcement is more likely to attract unwanted attention from the market regulators and can be restricted by the company's policy. Thus, opportunistic insiders, who are willing to take the risk to earn abnormal return, will trade their stocks prior to the QEA date.

The pre-QEA trades are those trades executed during 31 days before the QEA, excluding the last two days before the QEA. I calculate the profitability of each pre-QEA trade as the average daily abnormal return (AR) during the five-day window centered at the QEA date:

$$AR = \frac{1}{5} \cdot \sum_{t=-2}^{t=2} \alpha_{i,t},$$

where t is the QEA date and $\alpha_{i,t}$ is stock i's daily abnormal return on day t. Two days before the QEA are chosen because as the QEA date approaches new information about the company's upcoming earnings may become known to the public and be incorporated into the price. The two days after the QEA date is for the market to assimilate new earnings information into the price. A longer window would capture more of the insider's profit but it would contain more noise.

At the beginning of each year for every insider, with at least one pre-QEA trade, I calculate the average abnormal return of the insider's past pre-QEA trades:

$$Average\ AR = \frac{1}{B+S} \cdot \left(\sum_{i=1}^{i=B} AR_i(buy) - \sum_{i=1}^{i=S} AR_i(sell) \right),$$

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where *B* and *S* are the total number of buy and sell pre-QEA trades made by the insider prior to the start of the year. If an insider had multiple trades during one pre-QEA period, I combine them and classify as a buy (sell) if the number of stocks bought greater (less) than the number of stocks sold. I also exclude (combined) pre-QEA trades with absolute value less than CAD 3,000 to focus on more substantial transactions.

I then rank insiders into quintiles based on their *Average AR* and examine the profitability of all their trades during that year. I start the division into quintiles from the January 2006, which means that I have insider trading data for two and a half years before the first ranking.

Table 1 shows the insider-level characteristics.[14] During the observed period almost 40% of the insiders did at least one pre-QEA trade. Ranked insiders do about 10% less trades than the average insider in the sample. The ratio between the number of buys and the number of sales tends to decrease as the rank increases.

Table 1 – Insider characteristics

Rank	Number of unique insiders	Number of buys	Number of sells	Number of buys/ number of sells
1	117	558	917	0.61
2	227	1405	1919	0.73
3	228	2247	6670	0.34
4	161	1260	3266	0.39
5	135	659	2112	0.31
Ranked insiders	672	6129	14884	0.41
All insiders	1732	20892	53406	0.39
Ranked insiders/All insiders	0.39	0.29	0.28	

Note: This table provides and overview of the insiders, who were assigned to any of the quintiles during 2006-2018, and all insiders for the same period. All insiders are those who did at least one trade during the months when we observe the company i.e. company's average stock is above CAD 10, the trading volume is higher than CAD 100,000, and the absolute value of the company's monthly excess return is less than 200%.

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[14] Since the ranking is updated every year, the same insider may be counted to more than one quintile.

The average number of pre-QEA trades per ranked insider is 1.99; the mean value is 1. This is consistent with the fact that some companies restrict the trading by the corporate insiders prior to the quarterly earnings announcements.

The profitability (*Average AR*) of pre-QEA trades and corresponding firm-level characteristics are displayed in Table 2. Pre-QEA trades by insiders in Quintile 5 are very profitable. On average, they earn 10% above the market (*AR*) during the five-day window, centered at the QEA date. The median abnormal return is not very different: about 8.95%. Firms that have ranked insiders are bigger and have higher book-to-market ration that the average in the sample.

Table 2 – Pre-QEA trades profitability and the firm-level characteristics

Rank	Average pre-QEA profitability		Book-to-market		Size		Number of unique firms
	mean	median	mean	median	mean	median	
1	-3.29%	-2.84%	0.56	0.62	10330	2215	89
2	-1.04%	-0.88%	0.51	0.64	11732	4108	112
3	-0.20%	-0.17%	0.48	0.62	12206	4429	103
4	0.52%	0.53%	0.50	0.61	13885	5144	94
5	2.00%	1.79%	0.49	0.65	10265	2298	101
Ranked universe			0.49	0.63	9338	2472	173
All universe			0.33	0.53	5977	1326	363

Note: The table shows average and median abnormal return of pre-QEA trades in each quintile for 2006-2018 period. It also provides company-level characteristics of the size and the book-to-market ratio for each quintile. Mean (median) average pre-QEA profitability is the time-series mean of the annual cross-sectional mean (*Average AR*). Mean (median) book-to-market ratio is the time-series mean of the annual cross-sectional mean (median) book-to-market ratios. Mean (median) size is calculated similarly. If a company had more than one trade by insiders from a given quintile in a given year the company's size and book-to-market ratio is counted only ones for that year. I winsorize book-to-market ratio and size at 1% and 99% levels. Size is expressed in millions of Canadian dollars (CAD).

In order to test whether the profitability of the past pre-QEA trades predicts the returns on the future trades by the insiders, I use the calendar-time portfolio approach. The objective of the approach is to construct a portfolio of firms for which the event of interest occurred and calculate the portfolio abnormal return, also known as the Jensen's alpha:

$$r_t^{c,e} = \alpha + \beta \cdot r_t^{m,e} + \varepsilon_t,$$

where $r_t^{c,e}$ is the average excess return among companies during t's time period, $r_t^{m,e}$ is the market excess return at time t, and α is the portfolio abnormal return (alpha).

At the beginning of every month for each quintile I construct a long (short) strategy, which consists of stock that were bought (sold) by at least one insider from a quintile during the previous month. The long-short strategy is constructed in the following way: buy the stock if insider bought, short the stock if insider sold. The stocks are held in the portfolio for one month. The portfolio is rebalanced at the beginning of every month based on the new insider trades. I also consider the "benchmark" portfolio (All insiders). It is constructed in the same way, but the difference is that a stock is put into portfolio if it was bought by any insider during the previous month.

The first main results of the thesis are presented in table 3, which reports the average monthly abnormal return and the CAPM's alpha of equal-weighted portfolios. The monthly abnormal returns for the long strategy are mostly negative and not statistically significant for any of the quintiles. CAPM's alphas are not significant either. Regarding the short strategy, only sales by insiders from Quintile 3 have a statistically significant negative monthly abnormal return and alpha -1.2% and -1.15% respectively ($p<0.01$). This means that shorting the stocks, which were sold by the insiders for Quintile 3, can yield more than 14% abnormal return per year. The long-short strategy results in mostly positive abnormal returns, but they are only significant for Quintile 3 and All insiders strategies.

Another result presented in table 3 is that, although not statistically significant, insider's buys yield positive one-month abnormal return of 0.22%, while insider's sales produce much lower abnormal return (-0.07%) with lower t-statistics. This outcome is consistent with the existing literature (Lakonishok and Lee, 2001, Metrick, Zeckhauser, and Jeng 2003).

Table 3 – Portfolio returns (equal-weighted)

Rank	Long			Short			Long-short		
	Abnormal return	CAPM alpha	# Obs.	Abnormal return	CAPM alpha	# Obs.	Excess return	CAPM alpha	# Obs.
1	-0.60 (-0.75)	-0.75 (-0.91)	91	0.55 (0.72)	0.16 (0.21)	115	-0.33 (-0.54)	-0.22 (-0.39)	133
2	0.11 (0.19)	-0.31 (-0.52)	111	-0.55 (-1.24)	-0.80* (-1.78)	129	0.25 (0.71)	0.32 (0.86)	136
3	-0.78 (-1.54)	-0.73 (-1.40)	111	-1.20*** (-2.92)	-1.15*** (-2.70)	130	0.66** (2.08)	0.74** (2.44)	134
4	0.69 (1.14)	0.36 (0.60)	109	0.10 (0.23)	0.33 (0.79)	122	0.11 (0.31)	-0.03 (-0.09)	139
5	-1.02 (-1.04)	-1.29 (-1.29)	88	-0.84* (-1.66)	-0.68 (-1.40)	129	0.48 (1.13)	0.10 (0.24)	136
All ranked	-0.59 (-1.34)	-0.67 (-1.58)	142	-0.19 (-0.73)	-0.25 (-0.94)	147	0.02 (0.09)	0.03 (0.15)	147
All insiders	0.22 (1.26)	0.29 (1.37)	146	-0.07 (-0.42)	-0.18 (-1.06)	147	0.14 (1.04)	0.22* (1.68)	147

Note: This table reports the returns and alphas of equal-weighted portfolios constructed on insider trades. At the beginning of each year, starting from 2006, I assign every insider with at least one pre-QEA trade to one of the quintiles. The assignment is based on the average profitability (*Average AR*) of previous pre-QEA trades (Quintile 1 – lowest profitability, Quintile 5 – highest profitability). At the beginning of every month I construct a long, short, and long-short portfolios for each quintile. A long (short) portfolio consist of all the stocks that were bought (sold) by at least one insider from a quintile during the previous month. For example, the Quintile 1 long portfolio consist of all the stocks, which were bought by at least one insiders form Quintile 1 during the prior month. Stocks are held in a portfolio for one month and portfolios are rebalanced at the beginning of every month, based on the new trades. If an insider had buys and sells during a month, I aggregate those trades and classify it as a buy (sell) if the number of shares bought is higher (less) than the number of share sold. If there were many buys of a particular stock in a given month, only one share is put into the portfolio, meaning that each portfolio has no more than one share of a particular company in a given month. The company excess returns are calculated as follows: $r_t^{c,e} = \sum_{i=1}^{N} \frac{1}{N} \cdot r_{i,t}^{c,e}$, where N is the number of companies in a portfolio at time t, $r_{i,t}^{c,e}$ is the company i's excess return at time t. The abnormal returns and the market excess returns are calculated in a similar manner. *t*-statistics are shown in parentheses; 1%, 5%, and 10% statistical significance is indicated with ***, **, and *, respectively.

Table 4 shows the returns for the value-weighted portfolios. The long-short strategy constructed using trades of Quintile 5 generates CAPM's alpha of 0.38% per month (*p*<0.05). At the same time, CAPM's alpha for the Quintile 5 long portfolio is negative. Contrary to the equal-weighted case, the value-weighted All insiders portfolio yields almost zero return for each of the strategies. This means that, on average, corporate insiders are more prone to leverage their information in the small and medium-sized companies, where the corporate governance is less developed and which has smaller share of institutional investors, who have resources to monitor the company's management.

Table 4 – Portfolio returns (value-weighted)

Rank	Long			Short			Long-short		
	Abnormal return	CAPM alpha	# Obs.	Abnormal return	CAPM alpha	# Obs.	Excess return	CAPM alpha	# Obs.
1	-0.91 (-1.37)	-1.07 (-1.52)	90	0.73 (1.18)	0.17 (0.29)	115	-0.62 (-1.31)	-0.58 (-1.37)	133
2	0.10 (0.26)	-0.33 (-0.67)	111	-0.34 (-1.34)	-0.56* (-1.90)	129	0.17 (1.07)	0.23* (1.74)	136
3	-0.53 (-1.63)	-0.65* (-1.80)	111	-0.52* (-1.91)	-0.41 (-1.52)	128	0.22* (1.83)	0.12 (1.03)	134
4	0.48 (1.35)	0.28 (0.78)	109	-0.08 (-0.25)	0.12 (0.37)	121	0.11 (0.57)	0.05 (0.30)	139
5	-1.07 (-1.31)	-1.42* (-1.74)	87	-0.77** (-2.16)	-0.58* (-1.69)	128	0.55** (2.51)	0.38** (1.64)	136
All ranked	-0.30 (-1.31)	-0.20 (-1.23)	142	-0.02 (-0.21)	0.01 (0.12)	147	-0.04 (-0.56)	0.04 (1.10)	147
All insiders	0.01 (1.42)	0.01 (1.58)	146	0.00 (-0.41)	0.00 (0.15)	147	0.00 (1.15)	0.00 (1.04)	147

Note: This table reports the returns and alphas of value-weighted portfolios constructed on insider trades. The methodology is similar to the portfolios in Table 3. The difference is that each return is weighted according to the market capitalization of a company in a given month: $r_t^{c,e} = \sum_{i=1}^{N} \frac{m_{i,t}}{m_t} \cdot r_{i,t}^{c,e}$, where N and m_t are the number of companies in a portfolio and their total market capitalization at time t respectively, $m_{i,t}$ is the company i's market capitalization in at time t, $r_{i,t}^{c,e}$ is the company i's excess return at time t. The abnormal returns and the market excess returns are calculated in a similar manner. t-statistics are shown in parentheses; 1%, 5%, and 10% statistical significance is indicated with ***, **, and *, respectively.

Summing up, the framework of identifying opportunistic insiders by looking at the profitability of their pre-QEA trades does not give the same results as ones found by Ali and Hirshleifer (2017) in the US. Most of the estimates are not significant and long strategy produce negative returns for different quintiles. This may be because of the lack of data, since the sample size in the original paper was considerably larger, or because Canadian equity market is different from the US market. At the same time, the short and the long-short strategies for most of the portfolios yield negative and positive abnormal returns respectively. This indicate that a bigger sample might support some of the findings of Ali and Hirshleifer (2017).

4.2. The Effect of the Role of Insider

In order to check if the opportunism of the corporate insiders depends on their role in the organization, I split all insider into three groups:

1. Management: directors and senior officers of the issuer or its subsidiaries;

2. Large Shareholders: shareholders with more than 10% of the outstanding shares of the issuer and their management;

3. Others.

Table 5 show the characteristics of the corporate insiders, based on their role in the company. Most of the insiders in the sample belong to the company management. The ratios between the number of buys and the number of sales for the Management and Large Shareholders are 0.31 and 0.63 respectively. This is not surprisingly, since managers receive a significant portion of the company stocks through a stock-based compensation plans (Nittai et al. 2007)

Table 5 – Insider characteristics (role)

	Number of unique insiders	Number of buys	Number of sells	Number of buys/ number of sells
Management	1612	11942	39127	0.31
Large Shareholders	154	8936	14238	0.63
Others	10	14	41	0.34
All insiders	1732	20892	53406	0.39

Note: This table provides and overview of the insiders, based on their role in the company during 2006-2018, and all insiders for the same period. All insiders are those who did at least one trade during the months when we observe the company i.e. company's average stock is above CAD 10, the trading volume is higher than CAD 100,000, and the absolute value of the company's monthly excess return is less than 200%.

Table 6 – Firm characteristics (role)

	Book-to-market		Size		Number of unique firms
	mean	median	mean	median	
Management	0.33	0.49	6961	1824	282
Large Shareholders	0.36	0.50	5052	1023	118
Others	0.42	0.51	16518	5937	9
All insiders	0.33	0.53	5977	1326	363

Note: The table provides company-level characteristics of the size and the book-to-market ratio. Mean (median) book-to-market ratio is the time-series mean of the annual cross-sectional mean (median) book-to-market ratios. Mean (median) size is calculated similarly. If a company had more than one trade by insiders from a given group in a given year the company's size and book-to-market ratio is counted only ones for that year. I winsorize book-to-market ratio and size at 1% and 99% levels. Size is expressed in millions of Canadian dollars (CAD).

The firm-level characteristics are displayed in Table 6. The difference in the average

company size for Management, All insiders, and Large Shareholders portfolios is around 1

million CAD; with All insiders portfolio being in the middle.

Table 7 presents the returns on the equal-weighted and value-weighted portfolios. Only trades

by the managers of the company generate consistent and statistically significant abnormal

returns. The equal-weighted long-short strategy constructed using trades of managers generates

the CAPM's alpha of 0.24% per month ($p<0.05$). The returns on the value-weighted portfolio

based on the trades of managers is not economically significant, suggesting that managers are

more prone to trade profitably in the small and medium-sized companies, where the chances

of being prosecuted for illegitimated behavior are lower.

Table 7 – Portfolio returns (insider types)

	Long			Short			Long-short		
Type	Abnormal return	CAPM alpha	# Obs.	Abnormal return	CAPM alpha	# Obs.	Excess return	CAPM alpha	# Obs.
	Equal-weighted								
Management	0.36* (1.91)	0.27 (1.38)	146	-0.07 (-0.50)	-0.17 (-1.13)	147	0.18 (1.41)	0.24** (1.97)	147
Large Shareholders	-0.28 (-0.84)	-0.25 (-0.74)	145	0.02 (0.03)	0.24 (0.38)	141	0.06 (0.15)	-0.11 (-0.32)	146
Others	0.23 (0.24)	0.84 (0.81)	18	-1.23 (-0.93)	-1.05 (-0.77)	53	1.03 (0.91)	0.98 (0.88)	64
All insiders	0.22 (1.26)	0.29 (1.37)	146	-0.07 (-0.42)	-0.18 (-1.06)	147	0.14 (1.04)	0.22* (1.68)	147
	Value-weighted								
Management	0.02 (1.61)	0.02* (1.77)	146	0.00 (-0.40)	0.00 (0.26)	147	0.003 (1.02)	0.003 (1.01)	147
Large Shareholders	-0.03 (-0.31)	0.07 (0.57)	145	0.03 (0.11)	-0.13 (-0.46)	141	0.06 (1.30)	0.03 (0.69)	146
Others	0.67 (0.63)	1.30 (1.15)	18	-1.54 (-1.19)	-1.33 (-1.01)	53	1.47 (1.37)	1.36 (1.27)	64
All insiders	0.01 (1.42)	0.01 (1.58)	146	0.00 (-0.41)	0.00 (0.15)	147	0.00 (1.15)	0.00 (1.04)	147

Note: This table reports the abnormal returns and CAPM's alphas of equal-weighted and value-weighted portfolios constructed on insider trades. The methodology is similar to the one in Tables 3 and 4. The difference is that instead of the quintiles, the insiders are split according to their role in the company: Management, Large Shareholders, Others. *t*-statistics are shown in parentheses; 1%, 5%, and 10% statistical significance is indicated with ***, **, and *, respectively.

Figure 1 plots the long-term performance (CAPM's alpha) of portfolios constructed using trades of corporate insiders: All insiders, All Quintiles, and Managers. For equal-weighted portfolios, All insiders and Managers portfolios continue to generate returns up to four months, whereas All quintiles portfolio stops generating returns within three months. The Managers' alpha rises to about 0.7% after four months; the All insiders portfolio yields cumulative alpha of 0.6% over 4 months and starts to decrease afterwards. For value-weighted portfolios, only All Quintiles portfolio generates economically significant return over the first three months (1.1%) and starts to decrease rapidly afterwards. All Insiders and Managers portfolios stay around zero. These results suggest two trends. First most of the abnormal return on the trades by corporate insiders come from the small and medium-sized companies, which are less covered by the analysts and where the asymmetric information is bigger. Second, Ali and Hirshleifer's framework is better at identifying opportunistic insiders in the large companies, which can also be observed in Table 3 and Table 4.

Figure 1 – Cumulative Abnormal Return
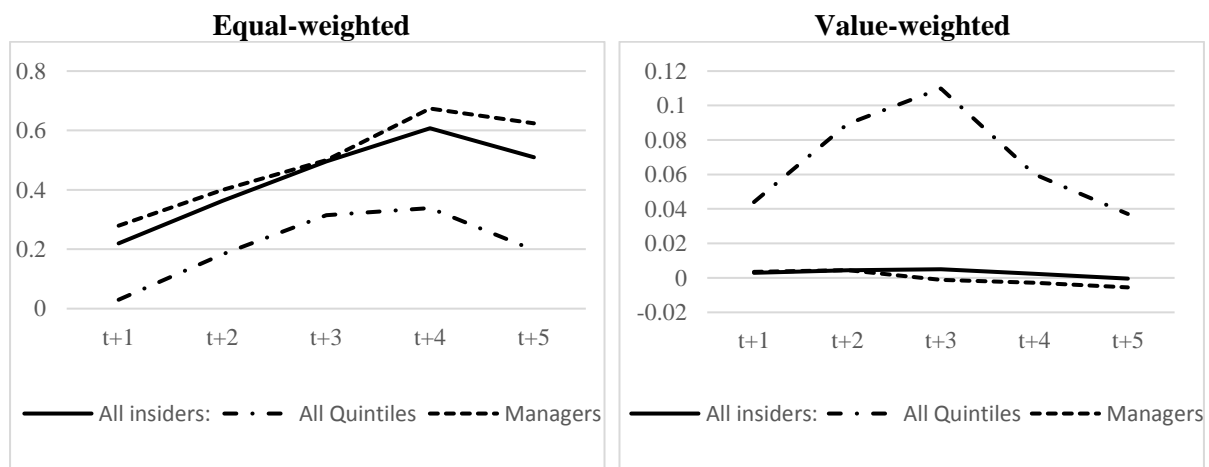
Note: This figure shows the cumulative abnormal performance of portfolios (CAPM's alpha) constructed using insider trades over the Jun 2003-March 2018 sample period. Portfolios are constructed as described in Table 3, 4, 5. Portfolios implement long-short strategy.

5. Conclusion

This thesis studies the opportunism among corporate insiders in Canada from 2003 to 2018. I use the methodology, proposed by Ali and Hirshleifer (2017), that looks at the profitability of insiders' trades prior to quarterly earnings announcements (QEAs). The idea of using the profitability of pre-QEA trades as a proxy for opportunism is based on the assumption that these trades are more likely to attract unwanted attention from the market regulators and can be restricted by the company's internal policy. Thus, opportunistic insiders, who are willing to take the risk to earn abnormal return, will trade their stocks prior to the QEA date.

The evidences, presented I this thesis, suggest that the profitability of pre-QEA trades does not indicate about the returns on the subsequent trades by corporate insiders. The results are not consistent with the applied framework and most of the estimates are not statistically significant. Although, the profitability of the pre-QEA trades seams to identify opportunistic insiders in the large companies: the Quintile 5 value-weighted portfolio generates a CAPM's alpha of 0.38% per month ($p<0.05$); portfolio based on the trades by all ranked insiders continues to generate positive abnormal return up to 3 months, whereas the portfolio, based on the trades by all insiders, yields almost zero return.

I also investigate if the opportunism of the corporate insiders depends on their role in the organization. Only trades by the managers of the company generate consistent and statistically significant abnormal returns.

Another results presented in this thesis is that insider's buys yield positive abnormal return, while insider's sales do not. This results are consistent with the existing literature (Lakonishok and Lee, 2001, Metrick, Zeckhauser, and Jeng 2003). Furthermore, the opportunistic insider trading is more common in the small and medium-sized companies, where the corporate

governance is less developed and which have smaller share of institutional investors, who have resources to monitor the management of the company.

Ali and Hirshleifer's framework does not prove its validity on the Canadian data. One of the potential reasons for this is the lack of data, since the sample size in the original paper was considerably larger. Further research on the insider trading in Canada will have to find a better way of dealing with companies with low stock prices (getting rid of the stocks with price below CAD 10 significantly decrease the sample size) and control for value and size effects, since they can affect the estimated abnormal returns.

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