Do Brokers of Insiders Tip Other Clients?

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Abstract

This paper finds evidence that brokers who execute insider trades on the Toronto Stock Exchange engage in tipping and insider trading. We find that on the day when insiders buy (sell), there is a significant increase in the proportion of non-insider client buying (selling) handled by the insider's brokerage firm. Furthermore, we find that the brokerage firm doubles the amount of its own buying (selling) on the day of insider buys (sales). Canada has similar insider trading rules to the U.S. and a number of other countries: insider trades are disclosed with a lag and tipping is illegal.

1. Introduction

Insiders are presumed to be asymmetrically informed, so knowledge of their trades is valuable. Stock brokers who handle the trades of corporate insiders are in a privileged position. Because the trades of insiders are publicly disclosed with several days delay, stock brokers possess non-public knowledge of these valuable signals.[1] They are thus in a position to share this private information with their other clients before the rest of the market finds out. By tipping their other clients about insider trades, brokers help those clients earn abnormal profits by allowing them to take positions mimicking those of the insiders before the wider market has an opportunity to do so. In turn, these brokers earn a reputation for themselves as well-connected advisers and thus may generate higher trading commissions. It is also possible that brokerage firms can profit from their inside knowledge by trading on their own accounts.

Tipping and trading on a tip are both illegal in Canada and the U.S. Tipping by brokers is a violation of the broker's fiduciary duty to their client.

The issue of broker tipping was highlighted in the Martha Stewart case. It was alleged that Ms. Stewart received a tip from her broker, Peter Bacanovic, that the founder of ImClone, Sam Waksal, was selling his shares ahead of news about FDA disapproval of an experimental drug. Ms. Stewart sold her shares and avoided a loss of approximately $100,000. The focus of this paper is to examine whether broker tipping of insider trades to other clients occurs in Canada. Canada has similar insider trading rules as the U.S. and a number of other countries: insider trades are disclosed with a lag and tipping is illegal.

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[1] McNally and Smith (2010) report that insider trades on the Toronto Stock Exchange are publicly disclosed a median of five days after the trade. The trades must be reported within 10 days after the trade.

This study employs a unique dataset from the Toronto Stock Exchange that flags insider trades and identifies the broker. The paper studies whether there is a direct link between the insider's broker and the trades of the broker's other clients. We find that on the day an insider trades there is a significant increase in the trading by other clients of the insider's broker. We examine intraday activity and find that this agency trading peaks in the half hour when the insider trade is executed. These findings are consistent with the tipping hypothesis.

The paper also finds a significant increase in the amount of principal trading by the broker on the day of the insider trade. Thus, brokers appear to use the inside information for their own (principal) accounts. This principal trading may be motivated to profit from the information. Alternatively, if the broker is also a market-maker then the principal trading may be inventory management in anticipation of market demand (supply) induced by the publication of the insider trade.

This is not the first study of broker tipping of insider trades. It is, however, the first to establish direct links from insider to broker to outside trader (shown in the schema). The literature on this topic has developed in stages, with each successive contribution providing more substantive but still indirect evidence of the links. In what follows, we review this literature.

Insider	➡	Broker	➡	Another Client

Geczy and Yan (2006) find that market makers affiliated with brokers used by insiders post more aggressive ask quotes when insiders sell their shares. The authors suggest that

increased quoting activity might reflect selling by outside clients who are tipped by the insider's broker. There is however an alternative explanation to their findings. The increased quote activity might simply be inventory management by the market maker in anticipation of market-wide selling after the publication of the insider sale. Geczy and Yan's quote data do not distinguish between principal and agency orders, and therefore the authors cannot reconcile the two possible explanations.

Khan and Lu (2011) report an increase in short sales immediately prior to large insider sales. They argue that this finding is consistent with front-running facilitated by leaked information. They admit that their data do not identify the information transmission mechanism from the insider to the front-running traders. The dataset used by Khan and Lu does not connect selling insiders to brokers. Neither does it identify whether short sellers are clients of the insider's broker. As such, the authors are unable to prove the first or the second links in the schema above.

Chakrabarty and Shkilko (2012) use data similar to Khan and Lu's but also control for confounding events. They find no evidence of front-running. They do however find evidence of abnormally high (low) short selling on insider sale (buy) days, which is consistent with learning from order flow and with concurrent information leakages. Chakrabarty and Shkilko conclude that the majority of their results are attributable to leakages (rather than learning). Using a unique dataset that connects insiders to executing brokers, they confirm the existence of the first link in the schema above. Nevertheless, they are unable to directly confirm the second link.

Our research further extends the literature on information flow through brokerage firms. Our database flags all insider trades and indicates which brokerage firm is on each side of every trade. With these data, we can precisely measure the amount of trading handled by the insider's

broker. Furthermore, our data allow us to identify the type of tippee (outside clients or the brokerage firm itself) and also to directly establish the second link in the figure above. None of the abovementioned studies of insider trading has been able to provide such a direct link between insiders, their brokers, and the brokers' other clients. Thus, we provide the most conclusive evidence on brokerages as conduits of information from insiders to other clients.

This paper has five more sections. Section 2 reviews the literature on insider trading and tipping. Section 3 discusses regulations and the data. Section 4 describes the testable hypotheses. Section 5 presents the tests and results. Section 6 concludes.

2. Literature Review

This study draws from two strands of the finance literature. First, there are a considerable number of studies that report that insiders generate abnormal trading profits and that their trading is indicative of superior information of the company's future cash flows. Second, a more recent strand of literature shows that brokerage firms appear to be a conduit of non-public information.

2.1 Insider Trading: Private Information and Market Reaction

Studies such as Jaffe (1974), Seyhun (1986), and Lakonishok and Lee (2001) provide evidence that U.S. insiders buy (sell) before price increases (decreases). More recently, in an analysis of insider trading, Inci, Lu and Seyhun (2010) show that insider buys demonstrate intraday timing. It is argued that insiders have this timing ability either because they are contrarians or because insiders have private information about their companies' prospects. Piotroski and Roulstone (2005) and Jiang and Zaman (2010) provide evidence in support of each respective argument.

In response to concerns about illegal insider trading, as discussed in Bettis, Coles, and Lemmon (2000), most companies institute blackout periods that lessen the ability of insiders to generate profitable returns. However, Hillier and Marshall (2002) and Huddart, Ke and Shi (2007) find that insiders are able to time their trades even in markets where insider trading is banned during prohibited or blackout periods. Thus, even with such restrictions, insider trading remains informed.

The literature also provides some evidence on the speed with which the market reacts to insider trades and to the public announcement of these trades in subsequent days. Aktas, de Bodt and Van Oppens (2008) show that insiders contribute significantly to faster price discovery on insider trading days. Inci, Lu and Seyhun (2010) find that on the day of the trade, insider buys are followed by traders who appear to piggyback on the buying even in the absence of public disclosure of the trades. They conjecture that the source of the buying activity may be information leakage by the insider's broker. Their data does not include brokerage information and so their explanation remains a conjecture. Our paper builds on this research by providing more direct evidence that brokers tip their other clients.

The market reaction to insider trade reports has also been studied. The current rules in the U.S. established in August 2002 require reporting within two business days. Previously, insiders only had to report within ten days of the end of the month of the trade. Chang and Suk (1998) find that, despite the delay under the old system of reporting, the market still had an abnormal response to public announcements of insider trades. Thus, investors who know about insider transactions ahead of public announcements can profitably trade.

2.2 Tipping

The past literature on tipping focuses on two types of information: 1) tipping of analyst recommendations and 2) tipping of insider trades. A number of studies document increased institutional trading prior to changes in analyst recommendations and conclude that the institutions may be tipped. The second stream (described in the introduction) provides evidence that information on insider trades is tipped by the insider's broker before its public release. There is a distinction between the legality of these two situations. While it may be inappropriate, it is not illegal for a brokerage firm to selectively inform its clients of its own research. It is however illegal for a broker to tip undisclosed material information about insider trading activity.

Irvine, Lipson and Puckett (2007) document abnormally high institutional buying beginning five days before the public release of an analyst's initial buy recommendation. The authors conclude that institutional traders receive tips regarding the contents of forthcoming analyst initiation reports.

Busse, Green and Jegadeesh (2012) study institutional trading surrounding analyst upgrades and downgrades. They find that institutions are net sellers over the five-day period prior to downgrades but are not net buyers over the five-day period prior to upgrades. Thus, their research indicates that analysts potentially tip their clients prior to downgrades but not for upgrades. The authors suggest that tipping prior to downgrades is more important for institutional clients because they can avoid actual losses on their holdings. Institutional clients are not likely to be as concerned about opportunity losses from not receiving tips on upgrades.

Christophe, Ferri, and Hsieh (2010) find evidence consistent with that of Busse, Green and Jegadeesh (2012). They report that there is a significant increase in short-selling in the three days prior to an analyst downgrade. Blau and Wade (2012) show that there is also an increase in

short-selling prior to analyst upgrades. The authors then suggest that short selling prior to analyst recommendations is not as much informed as it is speculative.

3. Regulation of Insider Trades and Data

Tipping and trading on the basis of undisclosed insider trades is illegal in Canada. Tipping occurs when someone with a special relationship to a listed company informs anyone of an undisclosed material fact.[2] The tipping and trading prohibitions apply to anyone with a special relationship with the listed company. This includes brokers and their clients who learn of a material fact prior to its public disclosure.[3] A material fact is something that affects the market price of the security, and per our literature review in section 2.1., insider trades are a material fact.[4] In Section 2.1, we reviewed the literature which documents significant market reactions to insider trades.

The tipping and trading opportunity is created by a lag between insider trades and their public disclosure. For the period of this study, insiders are required to disclose their trades within 10 days.[5] Subsequently, in 2010, the insider trading report deadline was shortened to 5 days. Canadian insiders report their trades through a web-based disclosure system, SEDI.[6]

Although illegal in Canada, tipping has not been prosecuted. As documented in McNally and Smith (2003), there has not been a single prosecution in Canada of a broker who tipped others about a trade by an insider. Likewise, no client of a broker who acted on tipped insider trading information has been prosecuted in Canada. One reason for the absence of prosecutions

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[2] National Policy 51-201, Part III, 3.1 (1).
[3] National Policy 51-201, Part III, 3.2 (1) (d).
[4] National Policy 51-201, Part IV, 4.1 (2).
[5] See National Instrument 55-104 Insider Reporting Requirements and Exemptions.
[6] Insiders of Canadian companies that are cross-listed on the Toronto Stock Exchange and a U.S. exchange must follow Canadian insider trading regulations and are exempt from U.S. regulations. Such companies are defined as "foreign private issuers," following Rule 405 of the U.S. Securities Act.

is that it is difficult to restrict insider trading by parties that are not direct insiders but are in a special relationship with the company (Arshadi, 1998).

3.1 Data

We use a dataset from the Toronto Stock Exchange (TSX) which was obtained with the permission of IIROC (the Investment Industry Regulatory Organization of Canada). The TSX provided us with data from the messaging system that records details of every order and trade processed by the system. The dataset is called STAMP, which stands for Securities Trading Access Message Protocol, and covers the period from October 2004 to December 2006. It includes system messages, price and quote queries, orders, order changes and cancellations, and trades. Our focus is mainly on the trades, of which there are about 500 million. A unique feature of this dataset is that all orders and trades by insiders are flagged. Insiders are required to disclose their status to their broker, who flags each order when it is placed. Thus, we can identify all orders and trades by insiders.

The system also identifies the brokerage firm handling each order and trade. We remove days when insiders execute through multiple brokerage firms (e.g., when the CEO and CFO trade on the same day but each uses a different broker). Finally, trades for brokers' principal (own) accounts have special identifiers, allowing us to separate brokerage own activity from client activity.

4. Hypotheses & Variables

This paper hypothesizes that stock brokers who handle the trades of corporate insiders pass along that information to their other clients. The stock broker's motive for tipping is to generate higher trading commissions. Clients perceive insiders as asymmetrically informed. By

tipping their clients about insider trades before their public disclosure, brokers allow their clients to mimic the informed insider. By doing so, the brokers enhance their reputation, attract more clients and generate higher trading commissions.

There are two possible motives for brokerage principal trading: profit and pre-emptive inventory management. Brokerage firms may profit from their insider trading knowledge by trading on their own accounts. Brokerage firms who make a market in the stock are affected by insider trades, because many market participants mimic the insider trade once it is publicized. This affects the inventory of the market maker. Market makers may trade in the direction of insider trades to pre-emptively adjust their inventory. Our data do not allow us to distinguish between the profit-seeking motive and the inventory management motive for principal trades.

4.1 Broker Market Share

Our goal is to measure whether brokers share information about their insider-client's trades with other parties (tippees). We distinguish between trades by two sets of tippees: (i) other clients of the brokerage firm (henceforth, agency trades) and (ii) the firm itself (henceforth, principal trades).

If tipping occurs, then agency trading by the broker will increase in the same direction as the insider-client's trade. We measure an increase by comparing the broker's trading against a benchmark – the average amount of trading of the other brokers handling the stock.[7] If a broker

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[7] An alternative benchmark is the average market activity of broker j over a period preceding the event window (days t-30 to t-6, where t is the insider trade date). The results using this alternative benchmark are qualitatively similar to those reported here.

handles a larger amount of trading relative to the benchmark, then we infer that the broker has tipped other parties.[8]

We employ an event-study methodology as follows. The events are insider trades across stocks and dates. We define event windows as days [-3; +3] surrounding the insider trade.[9] We analyze buys and sales separately, and we analyze agency and principal trades separately. For each day in the event window, we measure the volume of shares handled by the broker as a proportion of the total daily volume of shares traded. We call this ratio the broker's market share:

$$MS_{ij} = \frac{v_{ij}}{\sum_{j=1}^{J} v_{ij}}, \tag{1}$$

where MS_{ij} is the share of trading in stock i handled by broker j; v_{ij} is the volume of shares handled by broker j; $\sum_{j=1}^{J} v_{ij}$ is the total volume of shares of i traded by all brokers on that day. Note that v_{ij} excludes insider trades and principal trades, leaving only the agency trades.

Next, we compute the abnormal market share for the broker, AMS_{ij}, as the broker's market share less the benchmark market share. The benchmark is denoted $\overline{MS}$ and is calculated as the average market share of all other brokers in stock i (on that day). Brokers are only included in the $\overline{MS}$ calculation if they are active in the stock.

We average abnormal market share across all insider trades. Average abnormal market share is denoted $\overline{AMS}$ and reflects the abnormal trading activity of the average executing broker. Our null hypothesis is that $\overline{AMS}$ is zero and corresponds to no tipping. The alternative hypothesis is that the average broker tips other clients and so handles a larger proportion of trades (in the direction of insider activity) on the day of the insider trade.

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[8] For example, if broker j's historical agency trading share in stock XYZ is 4%, and this share increases to 8% on a day when an XYZ insider trades through broker j, we infer that broker j tipped his other clients of the insider trade.
[9] Our results are robust to alternative window definitions.

4.2 Determinants of Broker's Market Share

We extend the analysis to explore the cross sectional variation in broker abnormal market share. This section describes five determinants of abnormal market share: 1) broker affiliation; 2) the quality of the insider's information; 3) degree of asymmetric information; 4) order execution delay; and 5) scheduled versus unscheduled insider trades.

An independent brokerage firm is only concerned about its reputation. In contrast, a brokerage firm that is affiliated with a bank is also concerned about the reputation of its parent bank. As such, we expect bank-affiliated brokers to do less tipping than non-bank affiliated brokers. As shown in Figure 1, about two-thirds of insider trades in our sample are handled by nine bank-affiliated brokerage firms.[10]

We expect brokers to condition their activity on the quality of the information motivating an insider trade. Some insider trades are uninformed and are motivated by liquidity needs. Other insider trades are based on private information about the stock's over or under-valuation. We proxy the quality of the information with three variables: *CAR*, *Ins. Volume,* and *#Insider Trades. CAR*s are the abnormal returns on the stock subsequent to the insider trade. Informed buys (sales) should be followed by positive (negative) abnormal returns. We expect broker activity to be positively (negatively) related to *CAR*s for insider buys (sales).

If insiders have better quality of information, then we would expect them to take larger positions. As such, it is expected that brokers will tip more aggressively following greater insider trading volume. The coefficient of the variable *Ins. Volume* should therefore be significantly positive.

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[10] These firms are affiliated with the following institutions: the Bank of Montreal, the Bank of Nova Scotia, the Canadian Imperial Bank of Commerce, Desjardins Group, HSBC, the Macquarie Group, the National Bank of Canada, the Royal Bank of Canada, and Toronto Dominion.

The third proxy for information quality is the *# Insider Trades*. If the insider information is of high quality, then we would expect a number of insiders to trade on that information. As such, it is expected that brokers will tip more aggressively, and so market share should be positively related to the number of insider trades.

Larger companies are more likely to have less information asymmetry between outside investors and management. In part, this is because they are followed by more stock analysts. With less information asymmetry, there is less potential for profit from mimicking insider trading and so less tipping. Thus, the effect of market capitalization on tipping should be negative.

There may be a delay between order submission and execution. In this case, the broker may learn of the insider's trading intentions ahead of the trading day and possibly tip other clients on the days preceding the insider trade day. This will shift trading activity from the insider trading day to prior days. Accordingly, we expect that insider trades that are preceded by previously submitted insider orders will be associated with less abnormal agency trading on the day of the insider trade.

Finally, Cohen, Malloy, and Pomorski (2012) suggest that scheduled insider trades are less informative than unscheduled trades. We should therefore expect to observe less broker tipping for scheduled insider trades. We identify all cases in which the insiders buy (sell) in the same 11-day window (*t-5* to *t+5*) one year earlier and classify these insider trades as possibly scheduled.[11] Accordingly, we expect scheduled trades to be associated with less tipping.

We incorporate the factors mentioned above in the following regression model:

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[11] Cohen et al. (2012) use a longer historical period to classify scheduled trades. Unfortunately, the average insider reporting period in the SEDI insider trading database is eighteen months, so a one-year window maximizes data availability.

$$MS_{ijk} = \alpha + \gamma_1 Bank_{ijk} + \gamma_2 CAR_{ijk} + \gamma_3 MktCap_{ijk} + \gamma_4 Ins.Volume_{ijk} + \qquad [2]$$
$$\gamma_5 \# Ins.Trades_{ijk} + \gamma_6 D\_order_{ijk} + \gamma_7 D\_sched_{ijk} + \varepsilon_{ijk},$$

where MS_{ijk} is broker j's market share (either raw or abnormal) in stock i on insider trading day k; $Bank_{ijk}$ is a dummy variable with value 1 if broker j is affiliated with a bank and zero otherwise; CAR_{ijk} is the cumulative abnormal return for the stock from the event day (day t) to day t+10; $MktCap_{ijk}$ is the logarithm of the market capitalization of the company on day t; $Ins.Volume_{ijk}$ is the number of shares in the insider trade; $\# Ins.Trades_{ijk}$ is the number of insider trades on day t; D_order_{ijk} is a dummy variable with the value 1 if there is an insider order on days t-5 to t-1; and D_sched_{ijk} is a dummy variable with the value 1 if there was an insider trade (in the same direction) in the 11-day window one year prior.

5. Results

5.1 Summary Statistics

Our TSX data is restricted to the period from October 2004 to December 2006. During this period, we identify a total of 6,615 days with insider trades (event days) involving 1,103 stocks. Of these, 950 stocks have insider sells and 931 have insider buys. Thus, most stocks in the sample have both insider buys and sales.

Descriptive statistics for the sample are provided in Table 1. Insider trading is infrequent, but trades are large. There are 38 insider trading days per stock (on average) with an average of 18 (19) insider sale (buy) days, respectively. The average number of days with trading is 386 per stock. Thus, insider trading occurs on approximately one out of every ten days. Average insider daily sale (buy) volume is 71,625 (38,878) shares. Typical daily trading volume is 459,221 shares, so insider sales (buys) represent 8.5% (15.6%) of average daily volume.

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5.2 Daily Market Share

Table 2 shows the average market share and average abnormal market share $(\overline{AMS})$ of brokers on the days around the insider trading event. To avoid spillover effects from previously executed insider trades, we restrict the sample to insider trades that are not preceded by another insider trade in the same stock in the preceding ten days. The left-hand side shows the sub-sample of insider sales and the right hand side shows insider buys. Panel A presents the full sample of 6,615 events, and Panel B focuses on events without an insider order in the preceding ten days.

The results in Panel A of Table 2 demonstrate that there is a spike in the market share of the insider's broker's agency trading on the day of the insider trade. The statistics for $\overline{MS}$ provide a baseline for the broker's typical market share. The average market share over the non-event days is 5% around insider sales and 5.5% around insider buys. On the insider sale (buy) day, the market share rises to 7.0% (8.3%) of the daily volume.[12]

The abnormal market share $(\overline{AMS})$ further highlights the jump in market share on insider trading days. The $\overline{AMS}$ increases from 0.7% on day t-1 to 3.8% on the day of an insider sale – more than a fivefold increase. The $\overline{AMS}$ decreases to 1.2% on the day following the insider sale. We observe a similar pattern around insider buys. The $\overline{AMS}$ increases from 0.9% on day t-1 to 4.5% on the day of an insider sale – a fivefold increase. The $\overline{AMS}$ decreases back to 0.9% on the day following the insider buy. All of these changes in abnormal market share are statistically significant. Thus, our evidence is consistent with executing brokers' tipping their other clients as to insider trades.

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[12] Note that the $\overline{MS}$ statistic excludes insider volume and the volume executed for the broker's own accounts.

In Panel A, $\overline{AMS}$ is small but statistically significant in the days preceding the insider trade. This result may be attributed to the fact that an insider's order is sometimes submitted prior to the trade day, and so the broker knows the insider's trading intention in advance. Thus, tipping may occur prior to the event day. To investigate this issue, we eliminate all insider sales (buys) that are preceded by insider sale (buy) orders in the ten days before the insider trade. This reduces our sample of insider trades from 6,615 to 1,318.

Panel B of Table 2 presents results for the sample of 1,318 insider trades. Without the confounding orders, the filtered sample yields a cleaner and stronger result. We no longer find significant excess market share in the days prior to the insider trading day. The $\overline{AMS}$ on insider sale (buy) days is 5.0% (5.3%), which is larger than the abnormal market shares for the unfiltered sample (shown in Panel A). This marked jump in abnormal market share is consistent with broker tipping.

Table 3 shows the results of our analysis of principal trading by brokers. There is a similar pattern of abnormal market share on the insider trading day. The magnitude of the market shares is small because aggregate principal trading represents a small proportion of daily volume. For both insider buys and sales, with and without prior period insider orders, the insider trading date is marked by the highest level of market share. Panel B shows that the abnormal market share of principal selling (buying) is 0.6% (0.3%) on the insider trade date. This is noteworthy as the typical market share on days other than the insider trade date is around 0.2%. The finding is consistent with the hypothesis that brokerage firms conduct principal trades that mimic their client's insider trades. We note that the principal trading occurs prior to the public disclosure of the insider trades.

5.3 Cross Sectional Analysis

Table 4 contains the results of our multivariate cross-sectional analysis of broker market share. A number of the results are consistent with the tipping hypothesis; none are contrary to the tipping hypothesis.

The coefficient of *Bank* is negative and significant. This finding is consistent with our expectation that those brokers that are owned by a bank are more prudent than those that are independent because of greater reputational risk.

Three of the variables in the regression proxy for the quality of the insider's information: *CAR*, *Ins. Volume,* and *#Ins. Trades*. The coefficient of *CAR* is significant for insider buys but not significant for sales. The coefficients of *Ins. Volume* and *# Ins. Trades* are significantly positive in the case of insider sales, but not statistically significant for insider buys. The results for these variables are not identical across sales and buys, and we cannot explain the inconsistency. However, we note that none of the results reject the quality of information hypothesis. We conclude that these results are generally consistent with the hypothesis that brokers condition their tipping on the quality of the information.

The coefficient of *MktCap* is significantly negative across insider buys and sales. This finding is consistent with the argument that smaller companies have greater information asymmetry and so offer greater potential for profit from mimicking insider trades. It is not surprising that brokers tip their clients more following insider trades in small companies.

As expected, the coefficient of *D_order* is significantly negative for abnormal market share of insider buys and insider sales. This finding is consistent with the argument that when insiders submit orders ahead of the trading day, there is less broker tipping on the insider trade day. This result is also consistent with the contrast in results between Panels A and B of Table 2.

The coefficients of *D_sched* is not statistically significant. Thus, broker tipping does not appear to be significantly affected by whether or not insider trades follow a predictable pattern.[13]

We also conducted a cross-sectional analysis of market share of principal trades. We did not find much explanatory power in this analysis. We attribute the weaker results to the infrequency of principal versus agency trades.

5.4   Intraday Market Share

Table 5 presents intraday analysis of broker market shares. The insider trading day is divided into 13 half-hour intervals. The interval in which the insider trade occurs is time 0. All intervals prior to (post) the time 0 interval are the Pre (Post) intervals. Panel A presents the whole sample, and Panel B presents the results for a sub-sample of trades where an insider order that results in a trade is observed in the same 30-minute time interval as the trade. This reduces the sample size from 6,615 to 416, but this sub-sample has no confounding events in the Pre period.

In Panel A, for both buys and sales during all intraday periods, market share and abnormal market share are statistically significant. Tipping occurs throughout the day, but is concentrated in the time period immediately around the insider trade. The abnormal market share during time-0 is almost twice the size of the preceding and succeeding intraday periods.

In Panel B, the abnormal market share in the Pre period is smaller and of reduced significance compared to Panel A. Thus, we conclude that some of the tipping in the Pre period (evident in Panel A) is due to the brokers' knowledge of orders prior to execution.

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[13] The significance of the *D_sched* may be affected by our inability to trace insider trades for more than one year into the past.

Brokers appear to be acting quickly to tip other clients following the insider trade. This suggests that brokers view the information (regarding the insider trade) as valuable and perishable.

6. Conclusions

We examine the market share of brokers who execute insider trades on the Toronto Stock Exchange. On days when insiders sell, broker market share of agency trades increases from 4.6% to 8.2% (compared to the prior day). On days when insiders buy, broker market share increase from 4.6% to 8.6%. The market share increases are notable in that average market shares of these brokers is otherwise relatively unchanged in the three days before and after the day of insider trades. When we examine intra-day data, we are able to isolate the jump in broker market share to the half-hour in which the insider trade occurs.

We conduct a cross-sectional analysis of these insider trading day market share increases, and draw four conclusions. First, reputation affects tipping. Independent brokers experience significantly larger market share increases than brokers affiliated with banks. Second, brokers condition their tipping on the quality of the insider's information. Third, brokers tip less in shares of large companies, which is consistent with less information asymmetry in such companies. Finally, market share increases (on the insider trading day) are significantly smaller when insider orders are submitted during the 10 days prior to the insider trade.

We find that brokerage firms are engaged in increased principal trading on insider trading days. This finding suggests that brokers trade on their own account or that they tip other employees in their firm. Overall, the results suggest that tipping and insider trading by brokers is widespread for brokerage firms handling insider trades on the Toronto Stock Exchange.

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Figure 1. Percentage of Insider Trades Handled by Bank-Affiliated vs. Independent Brokerage Firms

This figure shows the percentage of insider trades handled by three types of brokerage firms that are members of the Toronto Stock Exchange. We define bank-affiliated brokerage firms as those affiliated with Canada's six largest banks (the Bank of Montreal, the Bank of Nova Scotia, the Canadian Imperial Bank of Commerce, the National Bank of Canada, the Royal Bank of Canada, and Toronto Dominion), two international banks (HSBC and Macquarie Bank), and with Canada's largest financial cooperative, the Desjardins Group. The brokerage firms that are not affiliated with banks are classified as independent brokerage firms.
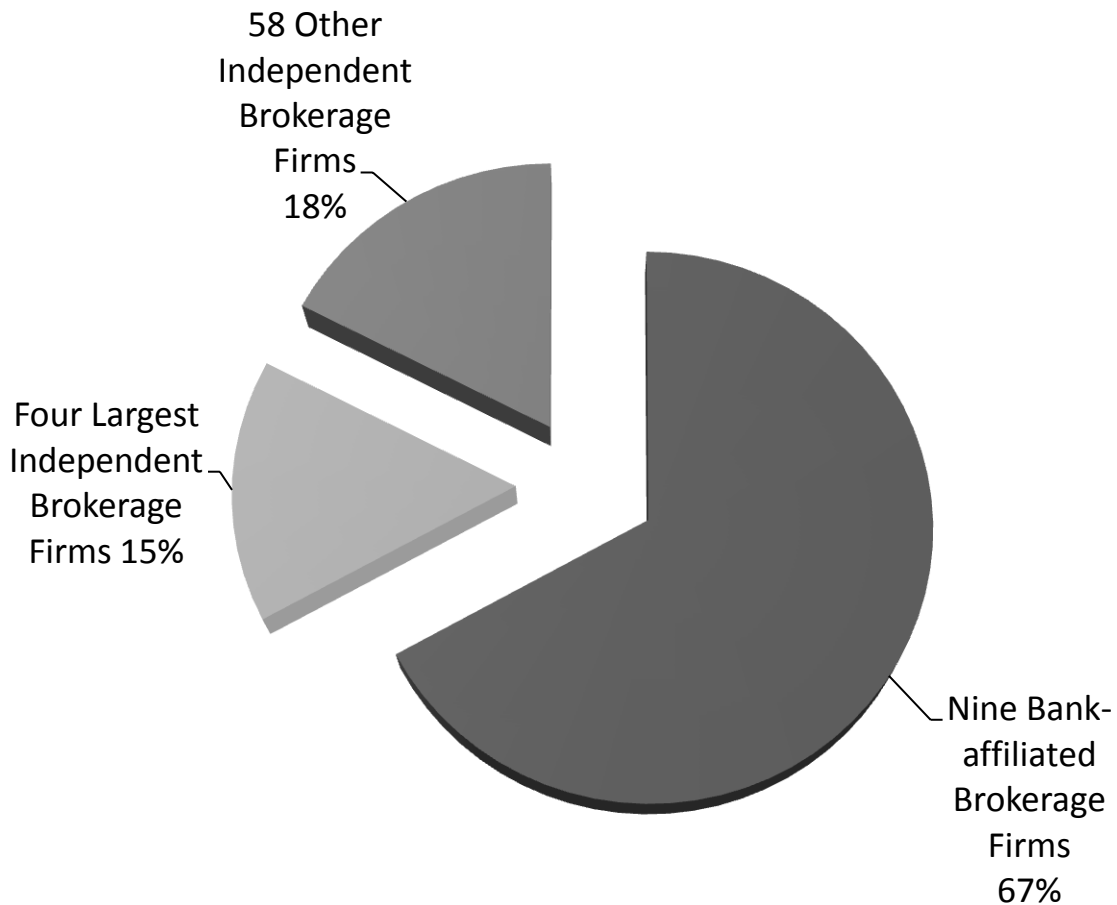
Table 1

Descriptive Statistics on the Sample of Insider Trades

This table provides information on insider trades for common stocks listed on the Toronto Stock Exchange from October 2004 to December 2006.

	Mean	Median	St. Dev.
Number of Insider Trading Days per Stock	38	19	55
Number of Insider Sale Days per Stock	18	8	31
Number of Insider Buy Days per Stock	19	5	42
Number of Trading Days per Stock	386	466	180
Insider Sale Volume (Number of shares per day)	71,625	14,822	308,274
Insider Buy Volume (Number of shares per day)	38,878	9,365	164,692
Daily Trading Volume	459,221	137,472	1,131,613

Table 2

Market Share of Agency Trades

The table reports average market share and average abnormal market share for agency trades around insider sales and buys. $\overline{MS}$ is the average (across all events) of the insider's broker's market share of agency trading on the indicated day. $\overline{AMS}$ is the average (across all events) of the insider's broker's abnormal market share of agency trading on the indicated day. The abnormal market share is calculated relative to the average market share of the other active brokers. We restrict the sample to insider trades that are not preceded by other insider trades in the 10 prior days. In Panel A, we use the full resulting sample of insider transactions. In Panel B, we restrict the sample to transactions that are not preceded by an insider order in the 10 days prior to the insider trade. Asterisks [**] and [*] represent significance at the 1% and 5% levels, respectively.

Event Day	Insider Sales				Insider Buys			
	$\overline{MS}$	p-value	$\overline{AMS}$	p-value	$\overline{MS}$	p-value	$\overline{AMS}$	p-value
Panel A: Full sample; nobs: 6,615								
-3	0.048[**]	(0.00)	0.006[**]	(0.00)	0.053[**]	(0.00)	0.002	(0.46)
-2	0.048[**]	(0.00)	0.007[**]	(0.00)	0.058[**]	(0.00)	0.008[**]	(0.00)
-1	0.050[**]	(0.00)	0.007[**]	(0.00)	0.059[**]	(0.00)	0.009[**]	(0.00)
0	0.070[**]	(0.00)	0.038[**]	(0.00)	0.083[**]	(0.00)	0.045[**]	(0.00)
1	0.052[**]	(0.00)	0.012[**]	(0.00)	0.059[**]	(0.00)	0.009[**]	(0.00)
2	0.051[**]	(0.00)	0.011[**]	(0.00)	0.052[**]	(0.00)	0.000	(0.96)
3	0.048[**]	(0.00)	0.005[**]	(0.00)	0.058[**]	(0.00)	0.007[**]	(0.01)
Panel B: No insider orders in days [-10; -1]; nobs: 1,380								
-3	0.046[**]	(0.00)	0.003	(0.39)	0.041[**]	(0.00)	-0.007	(0.09)
-2	0.048[**]	(0.00)	0.007	(0.18)	0.048[**]	(0.00)	0.003	(0.57)
-1	0.046[**]	(0.00)	0.006	(0.17)	0.046[**]	(0.00)	0.001	(0.85)
0	0.082[**]	(0.00)	0.050[**]	(0.00)	0.086[**]	(0.00)	0.053[**]	(0.00)
1	0.048[**]	(0.00)	0.008[*]	(0.05)	0.052[**]	(0.00)	0.007	(0.13)
2	0.053[**]	(0.00)	0.013[**]	(0.01)	0.042[**]	(0.00)	-0.006	(0.17)
3	0.044[**]	(0.00)	0.002	(0.67)	0.049[**]	(0.00)	0.004	(0.47)

Table 3

Market Share of Principal Trades

The table reports average market share and average abnormal market share for brokers' principal trades around insider sales and buys. $\overline{MS}$ is the average (across all events) of the insider's broker's market share of principal trading on the indicated day. $\overline{AMS}$ is the average (across all events) of the insider's broker's abnormal market share of principal trading on the indicated day. The abnormal market share is calculated relative to the average market share of the other brokers. We restrict the sample to insider trades that are not preceded by other insider trades in the 10 prior days. In Panel A, we use the full sample of insider transactions. In Panel B, we further restrict the sample to transactions that are not preceded by an insider order in the 10 days prior to the insider trade. Asterisks ** and * represent significance at the 1% and 5% levels, respectively.

Event Day	Insider Sales				Insider Buys			
	$\overline{MS}$	p-value	$\overline{AMS}$	p-value	$\overline{MS}$	p-value	$\overline{AMS}$	p-value
Panel A: Full sample; nobs: 6,615								
-3	0.002**	(0.00)	0.001**	(0.00)	0.002**	(0.00)	0.001**	(0.00)
-2	0.001**	(0.00)	0.000	(0.34)	0.001**	(0.00)	0.000**	(0.02)
-1	0.002**	(0.00)	0.000*	(0.04)	0.003**	(0.00)	0.002**	(0.00)
0	0.004**	(0.00)	0.002**	(0.00)	0.004**	(0.00)	0.003**	(0.00)
1	0.002**	(0.00)	0.001**	(0.00)	0.002**	(0.00)	0.001**	(0.00)
2	0.002**	(0.00)	0.000*	(0.04)	0.002**	(0.00)	0.001**	(0.00)
3	0.002**	(0.00)	0.001**	(0.00)	0.002**	(0.00)	0.001**	(0.00)
Panel B: No insider orders in days [-10; -1]; nobs: 1,380								
-3	0.001**	(0.00)	0.000	(0.57)	0.002**	(0.00)	0.001*	(0.02)
-2	0.001**	(0.00)	0.000	(0.44)	0.001**	(0.00)	0.000	(0.25)
-1	0.001**	(0.00)	0.000	(0.99)	0.004**	(0.00)	0.003**	(0.00)
0	0.007**	(0.00)	0.006**	(0.00)	0.004**	(0.00)	0.003**	(0.00)
1	0.003**	(0.00)	0.002**	(0.00)	0.003**	(0.00)	0.002**	(0.01)
2	0.001**	(0.00)	0.000	(0.86)	0.001**	(0.00)	0.000	(0.66)
3	0.001**	(0.00)	0.000	(0.95)	0.002**	(0.00)	0.001	(0.05)

Table 4

Determinants of Market Share of Agency Trades on Insider Trade Dates

The table reports the results of regressions explaining cross-sectional variation in the level of market share ($\overline{MS}$) and abnormal market share ($\overline{AMS}$). *Bank* is a dummy variable with value 1 if the broker is affiliated with a bank and zero otherwise. *CAR* is the cumulative abnormal return for the stock from the event day (day t) to day t+10. *MktCap* is the logarithm of the market capitalization of the company on day *t*. *Ins. Volume* is the number of shares in the insider trade. *# Ins. Trades* is the number of insider trades on day *t*. *D_order* is a dummy variable with value 1 if there was an insider order on days *t-5* to *t-1* and zero otherwise. *D_sched* is a dummy variable with value 1 if there was an insider trade (in the same direction) one year prior and zero otherwise. Asterisks ** and * denote significance at the 1% and 5% levels, respectively.

	Insider Sales			Insider Buys		
	$\overline{MS}$	$\overline{AMS}$		$\overline{MS}$	$\overline{AMS}$	
Intercept	0.297**	0.292**	0.121**	0.396**	0.432**	0.198**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Bank	-0.012*		-0.021**	-0.041**		-0.048**
	(0.03)		(0.00)	(0.00)		(0.00)
CAR	0.010	0.017	0.024	0.123*	0.084	0.144*
	(0.80)	(0.62)	(0.53)	(0.03)	(0.08)	(0.02)
Ins. Volume	0.015**	0.013*	0.014**	0.000	-0.001	-0.001
	(0.01)	(0.03)	(0.01)	(0.96)	(0.38)	(0.06)
# Ins. Trades	0.168**	0.149*	0.120	0.050	0.050	0.057
	(0.01)	(0.01)	(0.06)	(0.32)	(0.32)	(0.28)
MktCap	-0.010**	-0.009**	-0.003*	-0.014**	-0.013**	-0.005**
	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
D_order	-0.017**	-0.016**	-0.018**	-0.009	-0.010	-0.017*
	(0.00)	(0.01)	(0.01)	(0.18)	(0.12)	(0.02)
D_sched	0.017	0.024	0.012	0.043	0.021	0.031
	(0.23)	(0.10)	(0.45)	(0.27)	(0.57)	(0.55)
Broker FE	No	Yes		No	Yes	
Adj. R^2 %	8.54	12.52	4.24	8.25	13.92	3.42
# obs.		2,914			2,401	

Table 5
Intraday Analysis of Market Share

The table reports intraday market share on days of insider trades. $\overline{MS}$ is the average (across all events) of the insider's broker's market share of agency trading in the indicated period on the insider trading day. $\overline{AMS}$ is the average (across all events) of the insider's broker's abnormal market share of agency trading. Trading days are divided into 13 half-hour intervals. Time 0 is the half hour in which the insider trade occurs. All intervals prior to (post) the 0-interval are labeled Pre (Post) intervals. $**$ and $*$ represent significance at the 1% and 5% levels, respectively.

	Insider Sales				Insider Buys			
	$\overline{MS}$	p-value	$\overline{AMS}$	p-value	$\overline{MS}$	p-value	$\overline{AMS}$	p-value
Panel A: Full sample; nobs: 6,615								
Pre	0.063^{**}	(0.00)	0.036^{**}	(0.00)	0.080^{**}	(0.00)	0.033^{**}	(0.00)
0	0.105^{**}	(0.00)	0.060^{**}	(0.00)	0.119^{**}	(0.00)	0.062^{**}	(0.00)
Post	0.071^{**}	(0.00)	0.037^{**}	(0.00)	0.080^{**}	(0.00)	0.039^{**}	(0.00)
Panel B: No trades with orders in pre-period; nobs: 416								
Pre	0.041^{**}	(0.00)	0.023	(0.06)	0.041^{**}	(0.00)	0.026^{*}	(0.04)
0	0.074^{**}	(0.00)	0.068^{**}	(0.00)	0.075^{**}	(0.00)	0.055^{**}	(0.00)
Post	0.045^{**}	(0.00)	0.038^{**}	(0.02)	0.045^{**}	(0.00)	0.037^{**}	(0.02)