

# Does Piggybacking on Insider Trades Benefit Brokers?

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## **Abstract**

Using a unique trade level transaction dataset, we study the probable tipping induced trading activity by the non-insider clients of brokers of firm insiders (Insider Broker). We observe abnormally high trading activity around insider trades through Insider Brokers. Further, the effect is more prominent for their smaller clients. After an insider trades, the overall contribution of brokers who do not tip, systematically increases in the market over the next few weeks. Further, the number of insider trade instances through an Insider Broker over the next few months are affected by their tipping behaviour. This provides insights into preferential information dispersion by intermediaries and presence of market disciplining mechanism.

# 1 Introduction

Regulators have time and again tried to make the markets a level playing field for all the market participants. However, active market participants have always sought information. Firm insiders are one of the most suspected beneficiaries of better information signals. Their trades are highly scrutinized, and are extensively studied to understand the advantage (Seyhun (1986), Dymke and Walter (2008), Alldredge and Cicero (2015)) and the potential impact on markets (Aktas, De Bodt, and Van Oppens (2008)). From a regulator stand point there has been a lot of traction to limit the opportunities for the firm insiders to benefit by virtue of access to material non public information.

Despite plenty of restrictions by the regulators on trading by insiders, research shows that insiders are able to time their trades (Lakonishok and Lee, 2001). Hence, the knowledge about the timing of insider trades could be advantageous. Brokers<sup>1</sup> of these insiders possess this information. This could be particularly useful until it is disclosed to the public. Studies, including McNally, Shkilko, and Smith (2015), Inci, Lu, and Seyhun (2010), show that some brokers of insiders potentially tip their clients about insider trades. Li, Mukherjee, and Sen (2016) provides evidence that analysts associated with brokers of firm insiders provide more accurate forecasts around insider trades.

We utilize a unique data set constituting the trade book for equities trades executed on Bombay Stock Exchange(BSE) from the year 2009 through 2011. The dataset contains an identifier for the trading accounts of the individuals trading on the BSE. We identify an insider account using the publicly available insider filings containing details of trades in their own firms. The trading members associated with insider accounts are also identified. Based on the above information, we are able to track the trading activity of insiders' accounts and also that of the associated trading member.

We observe that, on average, there is an increase in the trading activity in insider's own firm stock on the day the insider trades. Further, the trading of insider firm stock becomes

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<sup>1</sup>We use the terms Broker and Trading Member interchangeably throughout this study.

more concentrated through certain brokers as compared to the trading of same stocks on days when a insider does not trade. Also, the trading portfolio of insider's broker becomes more concentrated in certain stocks on insider trade days as compared to that during other days. This alludes to a systematic change in trading activity during the days when insiders trade in the stock of their own firm, especially through the insider's broker.

In consonance with the findings of prior works, we find evidence supporting the possibility that some brokers on Bombay Stock Exchange tip their clients about insider trades. We study the trading activity by other clients of the broker of an insider (Insider Broker (IB)) around insider trading days. We observe that, when an insider trades in own firm stocks, there is an increase in the fractional volumes (in comparison to total BSE stock volumes) traded through an IB. The increase is significant as compared to the IB's historical trading as well as contemporaneous trading activity of other brokers on BSE. These evidences allude to the possibility that the trading activity of insider broker is induced by tipping. We do not provide direct evidence on tipping. Also, a broker tip that is not accompanied by a client trade based on the tip is not captured in the study.

Next, we study the characteristics of the pool of possibly tipped insider broker's clients. McNally, Shkilko, and Smith (2015) explore the broker and insider characteristics associated with tipping. They find that tipping activity is higher for independent broker who deal with insiders of the smaller firms. Also, insider trades of larger value are accompanied by higher tipping . But, do brokers demonstrate bias within their clients to share valuable information? In order to study this bias, we categorize the clients of the insider brokers as Retail, Institutional and Others based on the criteria used in Anshuman(2016) et al. and, focus on the trading activity by retail and institutional clients on insider trade days. Only during 28 times out of the 3558 instances of insider trades, have institutional clients traded to take similar positions as that of the insider, through the insider's broker. Also, the overall volumes of institutional trading via insider broker, on insider trade date are not comparable to retail client volume (institutional client volumes are low).

In order to obtain further insights, all the clients of insider brokers are ranked based on

their aggregated trade volumes over a benchmark period, prior to the insider trade. The biggest clients of insider broker (in terms of their trading activity with the broker) do not contribute to tipping induced trading activity. Rather most of the effect is driven by the clients who do not trade much through the broker during months prior to the insider trade day. This is consistent with Irvine, Lipson, and Puckett (2006) and Markov, Muslu, and Subasi (2017), who propose that tipping involves selective information sharing with preferred set of clients. This demonstrates a potential bias of insider brokers toward clients that presently do not have a significant contribution in the broking business. Anecdotal evidence suggests that brokers incentivize clients depending on the level of trust and prospects of future gains. The relatively lower involvement of biggest clients of the broker in abnormal trading on insider trade day, is indicative of lower tipping by the broker to this class of clients.

In the final section, we study the change in the contribution of insider brokers toward overall trading activity on BSE, owing to the tipping activity by the broker. The abnormal trading activity by the other clients of IB around insider trade days, represent a way to increase the current compensation of the broker. Hence, we also study the trading activity in the near future (post insider trade). First, we find that higher tipping by IB results in lower instances of trades by firm insides through the IB. The effect persists over 3 months post an insider trade. This demonstrates the loss in the source of information for the broker.

We find that as the insider broker demonstrates higher tipping tendency during an insider trade event, the trading activity of the accounts trading via this broker subsequently reduces. Also, the number of instances of an insider trade with a tipping IB reduce over the next few months. This demonstrates a possible existence of a disciplining mechanism by the clients of intermediaries. <sup>2</sup>

This study provides valuable insight into the nature of intermediaries and their selection bias among clients. This could potentially have regulatory implications for intermediaries.

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<sup>2</sup>We do not observe the tips which did not result in proportionate trading. For example, the instances when broker tips a client and the client does not trade via the broker. Such instances are not captured in the study.

Most of the contemporary literature on insider connected intermediaries and tipping in general, focuses on the short term risks and potential benefits accrued by intermediaries via piggybacking on insider trades. We explore the long term changes for the broker depending on involvement in potential tipping. The rest of the paper is structured as follows: Section 2 provides an overview of regulatory environment in India. Section 3 and 4 provide the data description and sample construction. Section 5 presents the hypothesis and analysis. Section 6 provides concluding remarks.

## 2 Regulatory Environment

In this section, we describe the regulatory environment in India. Securities and Exchange Board of India (SEBI) is the regulator for the securities market in India. The various market participants and regulations governing them have been elaborated in the following subsections:

### 2.1 Trading Members

A trading member (TM) is a stock broker trading on Bombay Stock Exchange and registered with SEBI. SEBI delineates the code of conduct for Trading Members under the Stock Brokers and Sub-Brokers Regulation, 1992.<sup>3</sup> The clause pertaining to “Breach of Trust” mandates that a broker does not disclose the details regarding her clients investments or make improper use of this information. As per this regulation a broker is defined as a person having trading rights at recognized exchange. For the purpose of our study we use the term broker and trading member interchangeably.

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<sup>3</sup>Source: <http://www.sebi.gov.in/acts/stockreg.html> (6<sup>th</sup> November, 2017)

## 2.2 Insider Trade Reporting

As per Prohibition of Insider Trading Act 1992<sup>4</sup>, directors and officers and substantial shareholders in listed companies are required to disclose acquisition or sale of own firm stocks under regulation 13 of this act. These have to be reported to the firm and corresponding stock exchange on which the insiders firm is listed within two working days if the change in the holdings of the person is greater than 25,000 in number or the transaction exceeds 0.5 million INR in value or if the trade results in change of ownership by more than 1% of share-holdings, whichever is lower. The disclosure includes details regarding insiders name, stock identifier, date of acquisition or sale of positions, and volume of shares traded. The disclosure has two broad categories: 1. Initial Disclosure, primarily pertaining to existing holdings when an insider assumes the office; and 2. Continual Disclosure, for the incremental change in the positions held by insiders/major share holders. We use these reported filings under Continual Disclosure to identify the trades by insiders. Many insiders report trades which are below the cut-off for mandatory disclosure. The company is also required to disclose the trades of its insiders within two working days of the receipt of disclosure from the insider under regulation 13(6).

## 3 Data

In this section, we describe the data.

### 3.1 Reported Insider Trades

Insiders report the details of their trades in own firm stock under regulation 13(4) of the Prohibition of Insider Trading Act, 1992. The scanned copies of these forms are uploaded on the Bombay Stock Exchange website.<sup>5</sup> The filings contain details about the name of acquirer or seller (insider), company scrip code (stock identifier), exchange on which the

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<sup>4</sup>Source: <http://www.sebi.gov.in/acts/insideregulation.pdf> (6<sup>th</sup> November, 2017)

<sup>5</sup>Source: <http://www.bseindia.com/corporates/anncomp.aspx?> (6<sup>th</sup> November, 2017)

trade was executed, mode of acquisition or sale, volume of shares transacted, total value of trade (INR), name of the trading member through whom the trade was executed, date of acquisition or sale of shares, and date of intimation to the company. For this study, we retain the filings where insiders name, date of transaction, volume of shares transacted and insider firm identifier are not missing. Also, only the trades traded via Bombay Stock Exchange (BSE) are considered. The filings of insiders are scanned and uploaded in PDF format on the BSE website. We exclude the filings which are unreadable and handwritten for the purpose of the study.

### 3.2 BSE Trade Data

We utilize a unique data set - the trade book for all the trades executed on the Bombay Stock Exchange from the year 2009 through 2011. The trade book contains the date of trade, stock identifier (BSE scrip code), quantity, price (in INR) at which the trade was executed, trading member (TM) code for buyer and seller, client identifier of buyer and seller, order number for buyer and seller and the category of the trader (buyer and seller). Each trader is categorized into 20 categories. Following Anshuman et al.(2016) we classify these into three broad categories:

1. *Retail* : Association of persons, Hindu Undivided Family, Individual, Sole Proprietor, Non Resident Indian;
2. *Institutions*: Foreign Institutional Investors, Mutual Fund, National Pension Scheme , Banks, Insurance Company, Indian Financial Investor; and
3. *Others*: Company, Foreign Venture Capital Fund, Merchant Banker, Trusts, Others, Corporations, Partnership Firm, Portfolio Management Scheme, Qualified Foreign Investors.

A pair of buyer order number and seller order number uniquely identify a trade. A unique combination of trading member id and client id distinctly identify a trader account. Hence,



the trading activity of each account can be monitored over the time period of this study. This feature particularly distinguishes our data from other publicly available transaction databases used in studies such as Inci, Lu, and Seyhun (2010).

### **3.3 Firm and Stock Data**

We utilise Prowess database to obtain daily stock price, daily stock transaction volume, market capitalization of firms. The details on firm corporate events are obtained from Capital IQ.

## **4 Sample Construction**

In this section we elaborate on our sample.

### **4.1 Identification of brokers of company insider**

We manually downloaded all the public filings from *Disclosures under SEBI (Prohibition of Insider Trading) Regulations, 1992* from the *Corporate Filings* section on Bombay Stock Exchange website. These contain the filings by company insiders, major non-individual shareholders and companies. The filings reveal that the stakeholders who have reported under respective clauses of the regulation, undertake positions in their own company via various channels. These channels majorly include secondary market purchase on Bombay Stock Exchange, secondary market purchase on National Stock Exchange, Initial Public Offering, Inter-se Transfer, Allotment of shares under Employee Stock Ownership Plan (ESOP), Bonus, Off-market Transactions, and Employee Stock Options (ESO).

A total of 40,000 filings are reported from the year 2009 through 2011. We use a PDF reader to extract the relevant reported trades from these scanned documents. These are transformed into 45,346 distinct transactions.<sup>6</sup> Even though, SEBI specifies the format for

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<sup>6</sup>A single filing may include multiple transaction reports. Also, some forms were not read by the PDF

trade reporting, many companies report in custom formats which requires additional manual correction of the transformed PDFs. 28,237 entries remain after eliminating the transactions apart from the secondary market trades on BSE by company insiders. But these include the reported transactions from non-standardized filings. So, we manually check each of these reports to exclude non-BSE trades. Among these, 9053 trades are executed on BSE by insiders, including 6265 purchases and 2788 sales of own firm stocks. Additional details are available in Table 1.

In the BSE trade book, a trader account is uniquely identified by the trading member code and client id. We utilize the publicly available insider filings to match an account with an insider. Our primary method for identifying the insider trades among other trades on the Bombay Stock Exchange is to match the stock identifier, date of transaction, and volume of each reported insider transaction with the trades present in our data. This procedure is similar to the matching process employed by Inci, Lu, and Seyhun (2010). However, we do not include the price of the stock or value of the transaction (from the filings) for matching because the reported price is not precise. The transaction stock prices are either missing, or reported as nearest value in lacs or include brokerages fees.<sup>7</sup>

Therefore, we identify all the accounts that have traded in the insiders' own firm's stock on the reported date. We then match the daily aggregate of directional trade volume for these accounts with the volume reported in the filing. We perform the transaction volume match on daily aggregated volume for an account to incorporate the possibility that insiders may split their trades throughout the day. This forms the pool of potential insider accounts. Based on this trade matching mechanism, there are three possible outcomes:

1. *Unique Match* : A reported insider trade matches uniquely to an account on a single day.
2. *Multiple Matches* : A reported insider trade matches to multiple accounts on a single

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Converter as they were handwritten or poorly scanned

<sup>7</sup>Few filings mention that brokerages are included in the reported value but do not specify the exact brokerage amount.

day.

3. *No Match*: A reported insider trade does not match to any trading account.

Each case is further evaluated differently. If a reported insider trade matches with a unique account (Unique Match), we attribute that account to the corresponding insider. 62.4% (5648) of the 9053 reported insider trades are matched uniquely to an account on BSE. To illustrate, say Mr. Insider has reported a total sale of 999 own firm stock  $s$  on day  $d$ . Upon inspecting the aggregated sales of stock  $s$  through every account on day  $d$ , we find that account  $a1$  is the only account that sold a total of 999 shares of stock  $s$  on day  $d$ . Hence, we conclude that account  $a1$  belongs to Mr. Insider. Additionally, for these unique matches if the insider filing contains the name of the trading member, we map trading member names to the trading member ids (available in the BSE trade data). We observe consistent one-to-one map of trading member names and trading member ids. This helps partially to affirm the efficiency of the match.

Further, if the reported insider trade matches to multiple accounts (Multiple Match), then we check if we have been able to uniquely identify an account (through a Unique Match) for the same insider. If there exists a uniquely matched account for the insider (for another insider trade instance) and that account is among the (matched) multiple accounts, we attribute the insider trade to that account. Extending the previous illustration, say Mr. Insider reports a buy of 1000 stocks of  $s$  (insiders' own firm) on day  $d2$ . In aggregate, 3 accounts-  $a1$ ,  $a2$ ,  $a3$ - have bought 1000 shares of  $s$  on  $d2$  therefore resulting in Multiple Match. But, we have been able to establish that account  $a1$  corresponds to Mr. Insider through a Unique Match scenario. Hence, we attribute this insider trade to account  $a1$ . The cases of Multiple Match primarily arise when insiders report round lot trades (trades with quantities such as 100, 500, 1000, 5000, 10000).

Admittedly, the mechanism used for Multiple Match scenario does not contribute to identifying additional insider accounts over and above those identified through a Unique Match. But, it helps reaffirm the accuracy of the matching algorithm and serves as check

for the mapped insider - account pairs.

Around 15% of the reported trades could not be matched to any account. One possible reason could be that the insider split the reported trade across multiple accounts with the same broker or across different brokers. Overall, the accounts for 76% of reported insider trades are identified. This match percentage is much higher than that achieved in Geczy and Yan (2006) and Inci, Lu, and Seyhun (2010).

The matched reported trades have been brokered by 328 distinct trading members. This is 30% of a total of 1095<sup>8</sup> trading members active on Bombay Stock Exchange from 2009 to 2011.

Once an account has been mapped with the insider, we can track the trading through this account. Hence, we study all the trades - reported and unreported - through identified accounts for the respective insiders own firm stocks. These constitute a total of 15,649 trades. We further refine the trades to be considered for this study. First, we exclude the insider trades for firms which have a stock price in the lowest decile on the insider trade day. Second, we exclude the insider trades below transaction amount of 50,000 INR, which is 10% of the threshold amount of INR 0.5 million. We introduce this cut because McNally, Shkilko, and Smith (2015) find that higher tipping is associated with larger valued insider trades. Third, we exclude the instances of insider trading days where, insiders of the same firm trade in opposite direction (through the same IB), on same days. This filter is employed because the direction of a tip (if any) through the IB cannot be clearly anticipated. For example, Mr. X and Mr. Y are insiders of firm  $f$  and have traded through a broker  $IB$  on day  $td$ . But, Mr. X buys 1000 shares of  $f$  whereas Mr. Y sells 1500 shares of  $f$  through  $IB$  on day  $td$ . We exclude such insider trades. Extending the same argument for insider trades that occur during a window of two days around each other through the same IB but in opposite direction, we eliminate them. A window of two days is considered because, the information about insider trade would be publicly available once the trade is reported to the exchange, the stipulated time frame for which is two days. Furthermore, these insider trades

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<sup>8</sup>As evaluated from BSE trade level data

are excluded from our sample to restrict our analysis to a non-overlapping windows where the IB has non-public information. Fourth, insider trades preceded by corporate events pertaining to own firms are also excluded. This is done to eliminate the confounding effect of news on trading activity. Post filtering the trades based on aforementioned criteria, 7,263 insider trades remain.

If an insider / multiple insiders buy (sell) the stocks of her own firm over consecutive trading days, through the same IB, then it is considered as a single event. This is referred as an Insider Trade Event(ITE). To illustrate, Mr. X and Mr. Y are insiders of firm  $f$  and have an account with broker  $IB$ . Mr. X buys 1000 shares of  $f$  on day  $td$  and Mr. Y buys 1500 shares of  $f$  the next day (i.e day  $td+1$ ) through  $IB$ . Then we club these two insider trades into a single insider trade event, which has a start date of  $td$  and end date of  $td+1$ .

The 7,263 filtered insider trades form 3,558 insider trade events. A basic summary is reported in Table 1 and Table 2. The hypothesis and empirical analysis are elaborated in the following section.

## 5 Hypothesis and Empirical Analysis

Do the IBs share information about an insiders trade with other clients? Del Brio, Miguel, and Perote (2002) establish that insiders trade profitably in their own firm stocks. Krishnan and Rangan (Working Paper, 2016), specifically focus on the legal insider trading in the Indian stock markets. They find that insider trades are profitable and can predict stock returns up to one year. Furthermore, they document that insider trading prior to earnings announcements result in profits due to foreknowledge of the news. Chauhan and Kotha (Working Paper, 2012) study the impact of an amendment in the Prohibition of Insider Trading Act (by SEBI) in the year 2008 to establish abnormal returns around insider trades. Brochet et al. (Working Paper, 2016) also find that insider trades are profitable and have significant returns predictability over a year in India. Further more, Alldredge and Cicero (2015) find that unscheduled insider trades are more profitable.

Subsequently, an insider trade could be perceived to contain additional information which is not yet incorporated in the market. In order to ensure that the other equity holders are not disadvantaged, many regulators mandate that the insider trades in own company stocks are made public. The Indian regulator, Securities and Exchange Board of India (SEBI) also mandates that the insiders file the details of their trades with the exchange and the firm under *Prohibition of Insider Trading Act, 1992*. If the trades meet the criteria<sup>9</sup>, the trades ought to be reported within two working days to the firm and the exchange on which the firm is listed. Essentially, insider brokers would be advantaged only until these insider trades are not reported and the information is public. Hence, we expect a tipping induced trading activity to immediately follow the insider trade (or prior, if there is front running).

The trading activity (in terms of transaction volume on the exchange), is higher for insider firm stocks on the days when firm insiders trade. As evident from the univariate reported in Table 2 ,the average volume of insider firm stocks traded on BSE on the insider trade days is roughly 1.7 times as compared to the volume on non-insider trade days. The average volume is higher (around 1.35 times average volume on days when insiders do not trade) even after excluding the insider trades. Also, the IB caters to higher transaction volume of insider firm stock overall. Interestingly, on the insider trade days, the transaction volume (of insider's own firm stock) through IB is almost twice as compared to the volumes on days when insiders do not trade .

The insider broker therefore is in possession of information by the virtue of being an intermediary in the trading process. One of the channels through which this information could be exploited is by engaging in a proprietary trade and mimicking the insiders trade i.e. trading in the same stock and direction as that of the insider. But this could lead to prosecution under *Stock Broker and Sub-Broker Regulation*.

Another channel is to tip other clients about the insiders trades. If tipped client trades, the broker could make profits from transaction fees or alternative compensation arrangements. Given that detection of such an activity is difficult and no broker has been prosecuted

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<sup>9</sup>Elaborated in section 2.

for this, this channel could be perceived as less risky.<sup>10</sup> We are unable to observe the actual tipping activity, but we can observe abnormal trading activity around an insider trade.

In order to get preliminary insights, we study the overall trading activity on BSE exchange around insider trade day. We evaluate the Herfindahl-Hirschman Index to estimate the level of concentration of brokers (volume and transaction value-based) on BSE for trades pertaining to insider firm stock. To estimate the HHI for insider's own firm stock,  $HHI_{tm\_ofs\_v}$  ( $HHI_{tm\_ofs\_t}$ ), based on broker volume (transaction value), market share of each broker trading in insiders' own firm stock is evaluated. Individual broker's volume (transaction value) based market share in insider stock is calculated as the ratio of total daily volume (transaction value) of the stock traded thorough the broker and total daily volume (transaction value) of the insider's own firm stock traded on BSE. The HHI is the sum of squares of the market shares so evaluated. As evident from Figure 1, on an average, the trading of insiders' own firm stock becomes more concentrated within brokers on insider trade days. It drops back to prior levels on the subsequent dates. The source of this increment in the level of concentration of brokers needs further investigation.

To gain a complimentary perspective, we focus only on trades through IB around insider trade days. We evaluate the concentration of stocks traded through the IB around insider trade days. The HHI of IB,  $HHI_{s\_ib\_v}$  ( $HHI_{s\_ib\_t}$ ), based on the concentration of stock volume (transaction value) traded by them, is calculated as the contribution of volume (transaction value) of each stock to the total volume traded through the IB on a day. We observe an increase in the concentration of stocks traded through an IB on insider trade day as evident from Figure 2.

In the light of the increment in the concentrations (of stocks within IB and change in concentration of brokers for insider own firm stock trades), in conjunction with the increase in insider firm stock trading volume through IB (refer Table 2) prods us to focus on directional trades through IB in the insider traded stocks.

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<sup>10</sup>As per watchoutinvestor.com, no trading member has been litigated against under the Stock Broker and Sub-broker Regulation between the period of 1995 and 2011

As in McNally, Shkilko, and Smith (2015), we observe market share of an insider broker around an insider trade day. Market share  $MS_{ijt}^{bs}$  is defined as the fraction of directional volume of stock  $i$  traded through a broker  $j$  ( $\nu_{ijt}^{bs}$ ) within the total directional volume of stock  $j$  traded on BSE on day  $t$  ( $V_{it}^{bs}$ ). For the purpose of market share calculation, insiders trade volumes are excluded.

$$MS_{ijt}^{bs} = \frac{\nu_{ijt}^{bs}}{V_{it}^{bs}}$$

Similar to McNally, Shkilko, and Smith (2015) we propose that if the directional market share of the broker on insider trading day is significantly different from the average and from other brokers in the market, then it is indicative of tipping.

Hence, we observe the difference in trading activity (abnormal market share) in insider traded stock  $i$  for the insider broker  $j$  on insider trade day  $t$  in the insider trade direction  $bs$ . Abnormal market share is evaluated as the difference between the market share ( $MS\_IT E_{ijt}^{bs}$ ) of broker  $j$  in stock  $i$  on day  $t$  in direction  $bs$  and the benchmark market share ( $MS\_Bench_{ijt}^{bs}$ ) for broker  $j$  in stock  $i$  and direction  $bs$ . The benchmark market share is the average market share over a period of 40 trading days, starting 60 trading days prior to insider trade and ending 20 days prior to the insider trade.

As reported in Table 3, there is a significant increase in the buying (selling) activity by the clients of insiders brokers when an insider buys (sells) her own firm's stock. The difference in the market share on insider trade date and benchmark market share peaks on the insider trade day. There is a 4% (3.2%) increase in the market share of the IB on insider trade days when insider buys (sells) stocks of her own firm.

The increase in the trading volume through IB could be because of increase in the overall trading activity in the market. If this is the case, there should not be a significant difference in the volume of insider stock traded through an IB verses a non-IB. Therefore, we next study the trading activity (in the insider traded stock) across all the brokers on BSE around an insider trade event. When an insider trades in her own firm's stock in the same direction



over consecutive trading days, we treat it as a single clubbed event.

Figure 3 depicts the daily market share of IB and non-IB in insider's stock around insider trade day. We observe a discontinuity in the market share on insider trade days for buy and sale insider events. The directional market share of IB increases post an insider buy or sale. This is further elaborated through the econometric study below.

We expect that when an insider trades, the volume ( $vol\_std_{ijt}^{bs}$ ) traded through a broker in the insider traded stock should be explicable by whether an insider traded through her. The volume is standardized by the total volume of stock  $i$  traded on BSE for comparability across trading days. We focus on a window of  $2w$ , where  $w$  is certain number of days, around an insider trade event to study the proposition. The insider trade day is considered as the reference. The day immediately preceding insider trade event is excluded.  $w$  consecutive trading days prior to that formulate the pre-period and the dummy variable  $post$  equals 0 for trades during these dates.  $w$  immediately succeeding dates, post an insider trade day (inclusive of the event day) formulate the post-period and dummy variable  $Post$  equals 1 for these. The  $shared\_broker$  dummy variable is assigned 1 if the trades are executed by insider broker for each event and 0 otherwise. This warrants a deeper investigation and hence we use the following regression:

$$vol\_std_{ijt}^{bs} = \alpha + \beta_1 * shared\_broker + \beta_2 * post + \beta_3 * shared\_broker * post + \epsilon_{ijs} \quad (1)$$

We run the above specification for  $w$  equals 1 and 3 days. The results are reported in Table 4. The results suggest that insider brokers have higher volumes as compared to other brokers on the exchange. After an insider trades, the volume of the insider broker is significantly greater than that of a non-insider broker in insiders own stock. The above regression is evaluated separately for insider buys and insider sales. Furthermore, the model has been estimated with fixed effects for insider trade event and trading member separately. For insider buys (sales), after the insider trades, the market share of IB increases by 2% (1.35%)

for  $w=1$ .

## 5.1 Who is tipped?

We observe an increase in the abnormal trading via insider brokers when an insider trades. This could be induced by tipping. We evaluate which clients contribute to this abnormal trading activity and hence are potentially tipped by the broker. We would like to emphasize that we do not provide direct evidence of tipping. Also, we do not capture the tips which did not result in a trade within this study. We utilize two broad ways to categorise client accounts: 1. Category (Retail or Institution); and 2. Trading Activity (Based on Volume).

The study of the characteristics of clients who are tipped is important because there isn't clarity about the potential recipient. On the one hand, as in Irvine, Lipson, and Puckett (2006), it is probable that the institutional clients and high volume clients receive tips from brokers. But these, on receiving a tip from broker could become wary of the confidentiality of their own trades. This could hamper the trust and hence the broker's future business with them. To unravel the actual overall effect, we focus on these broad categorizations separately.

Firstly, we look at the contribution of retail and institutional client to the market share on the insider trading day. To analyse the category of clients that is tipped, we restrict the events to those which have the categories for all clients who traded during the event.<sup>11</sup> Among the 3,558 insider trade events, 1,843 events are accompanied by trades of other non-insider clients which imitate the insider trade i.e. the accompanying trade occurs through the IB in insider stock on insider trade day and in the same direction as that of the insider. Within these, we have a missing accounting category for 195 events. All the accounts which traded during the event in the same direction as that of the insider are considered for evaluation. These are referred as Imitator Accounts. Table 5 demonstrates the univariate for these

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<sup>11</sup>We do not have the categories of account for the year 2011. Hence, if on any of the event date, we have any volume for an account for which the category is missing, we do not take the event into consideration for our study in this section.

accounts. We observe that only for 28 events out of the 1648 insider trade events which have a corresponding trade that mimics the insider trade, there exists a trade by Institutional Imitator Account. This shows that institutional clients do not demonstrate a high trading activity coinciding with the insider trades.

To gain further insight into the potentially preferred clients of broker, we categorize all the insider broker accounts based on their past trading activity with the broker. We hypothesize that the insider broker do not tip big clients.

Since, tipping activity is found to be maximum during the insider trade event, the focus is on that duration. We consider all the trades (excluding insider trades) in the insiders' own firm stock through insider broker and in the same direction as that of the insider (Potentially Tipped Clients). These are aggregated on account-day level and divided into deciles based on their trading activity during a benchmark period of  $b$  days prior to insider trade day. The following specification is used to study the above argument:

$$MS\_ITE_{ijt}^d = \alpha + \beta_1 * High\_Rank_{jb} + \beta_2 * MS\_Bench_{ijt}^d + \beta_3 * Log\_Insider\_Vol_{ijt} + \epsilon_{ij} \quad (2)$$

The ranks are evaluated based on aggregated trading volumes for each account with insider broker  $j$  over two benchmarks periods of 40 and 20 days, 20 prior to insider events. Dependent variable,  $MS\_ITE_{ijt}^d$ , is the directional ( $d$ ) market share of the insider broker  $i$  in insider traded stock  $j$  on insider trade day  $t$ .  $High\_Rank_{jb}$  is a dummy for high ranked accounts of broker  $j$ , based on aggregated trades during a period of  $b$  trading days 20 days prior to insider trade event. The aforementioned specification is run using different cuts for an account to qualify as “High Rank”. Firstly, we categorize the accounts that occupy the top two deciles (9<sup>th</sup> and 10<sup>th</sup>) based on benchmark trading activity as “High Rank” and assign  $High\_Rank_{jb}$  as 1 for these. All other accounts are assigned  $High\_Rank_{jb}$  as 0. Next, we include all the accounts above 6<sup>th</sup> decile as “High Rank”. We observe similar effects for this specification. Additionally, we control for historical market share ( $MS\_Bench_{ijt}^d$ ) which

is evaluated as specified in the previous section and volume traded by the insider in stock  $i$  via broker  $j$  on day  $t$  through *Log Insider Vol.* The results are reported in Table 6.

The abnormal trading activity is accompanied by a lower trading activity in insider stock by the most active traders of the insider broker. We observe similar trends for ranks evaluated over two benchmark periods. So, the most active clients do not seem to be a part of the preferred clients pool who receive a tip from the brokers and hence imitate the insider trade. This alludes to the possibility that the brokers divulge information to that set of clients who are not among the top clients for the broker based on trading activity.

## 5.2 Effects of tipping on the broker

The abnormal increase in trading activity around insider trade days provide some evidence around tipping induced trades. But, we expect that the decision to leak information about an insider trades is governed by two opposing forces:

1. *Profitability*: The magnitude of profits that could be derived by tipping.
2. *Repercussion*: The damage or reduction in future profits due to reputation and litigation risk of involving in such an activity .

*Profitability* could result in profits majorly through these three channels:

1. Current profits due to transaction fees from tipped client imitating the insider trades;
2. Future profits due to increased trading activity in the future in lieu of a profitable tip;  
and
3. Off-line compensation arrangement which could constitute any other form of compensation. For instance, a part of the profits made by the client due to the tip or subscription to other service with the broker etc.

*Repercussion* could manifest primarily as:

1. *Extreme Repercussions*: Litigation and major harm to reputation. For example, if brokers are proven to be in violation for “breach of trust”.
2. *Mild Repercussions*: Reduction in the profits over time due to loss of clients. For example, if the broker is perceived as biased, the disadvantaged clients will eventually disassociate with the broker.

. The degree of tipping could also be perceived as a signal for insider broker’s *current gain* from tipping. As evident from Table 3 and 4, this is an active channel. We expect that the long term effect of tipping is the net result of increase in *future gain* due to tipping and *mild repercussions* reflecting through trading activity because of reputation damage.<sup>12</sup> *Offline Compensation Arrangement* is unobservable and not in the purview of our study. Another unobservable phenomenon is the case when a broker tipped the client but the client does not respond to it.

Out of the 3,558 insider trade events, during 1,715 events, there isn’t a single trade through the IB that mimics the insider’s trade. As we only study the insider trades which have insider trade volume of greater than 50,000 (which is 10% of the reporting threshold), it is reasonable to assume that these trades are material. Despite this, for these 1,715 insider trades, brokers do not tip. This shows that the effect of *repercussion* can dominate the effect of *profitability*.

To gain further insights into the overall effect of tipping, we focus on the following:

### 5.3 Future trades by Firm Insiders

The trades by insiders are essentially the source of information for the IB. Hence, the *Current Profitability* of IB through tips can be sustained if insiders continue to trade with the IB. But, the tips of the IB to their other client may reduce the profitability of trades for the insider. If the trades of tipped clients front run the insider trades, the prices of stocks would

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<sup>12</sup>We do not consider *Extreme Repercussions* because none of the brokers have been prosecuted for tipping from 1995 to 2011, as per [www.watchoutinvestors.com](http://www.watchoutinvestors.com)

move and profitability of insider trades could get materially affected. Even if the trades of the tipped clients do not front run insider trades, the overall insider trade profits may still be impacted as insiders typically trade over few days. In our sample, on average, an insider engages in positions of her own firm over 3 consecutive days during a single insider trade event. Hence, the subsequent insider trades (over next few days) are affected due to price movement in stocks resulting from the trades of tipped clients.

Now we focus on the effect of tipping on future insider trades with the IB. We study if the abnormal trading activity around insider trade effects the number of insider trades over the subsequent 3 and 6 months through the following model:

$$ITE_{n_m} = \alpha + \beta_1 * AbnormalMS + \epsilon \quad (3)$$

$ITE_{n_m}$  is the number of insider trade instances through IB during next  $m$  months after an insider trades. The abnormal trading activity is measured as the increased market share ( $AbnormalMS$ ) during the current insider trade. Abnormal market share ( $AbnormalMS$ ) is evaluated as described in Section 5. The results are given in Table 7. The increased tipping by IB results in lower instances of insider trading over the next few months. An increase of 10% in abnormal market share results in reduction of insider trades by 3.7%. The coefficients are also reported for stock fixed effects and standard errors are clustered at stock level. It is evident that tipping impacts the number of insider trades through the broker and the effect persists over the next few months.

## 5.4 Future trades by Other Clients

Next, we study the change in the overall market share of the IB around insider trade owing to the abnormal trading activity (potential tipping) during insider trading days. Table 8 shows the summary statistics for the change in the market share of IB on BSE. It is evident that on average, the market share of the insider broker increases post insider trade. But, the accounts that were potentially tipped (and imitated the insider trade) do not demonstrate

increase in the trading activity through the IB over the next 2 months.

To investigate further, we now study the effect of tipping on the overall client base of the IB. We compute the average daily market share of IB (on BSE) around insider trade day. The daily fraction of stocks traded via IB on BSE (i.e. ratio of total stock volume of IB and total volume of stocks traded on BSE) are evaluated and an average is calculated over a period of  $p$  trading days, starting at  $p+w$  days prior to an insider trade day and ending  $w$  days prior to insider trade day. This serves as our benchmark. This is compared to a similarly evaluated measure after an insider trade day. The interval for this starts  $p$  days after insider trade and ends  $p+w$  days after insider trade day. We expect that the difference in the standardized trade volumes of the insider broker are explicable by their tendency to tip. The trading volumes are standardised by total BSE stock volume to increase cross-sectional comparability. Table 9 reports the results for the following regression:

$$\text{Diff\_MS}_{jt} = \alpha + \beta_1 * \text{Tip}_{ijt} + \epsilon \quad (4)$$

The dependent variable  $\text{Diff\_MS}_{jt}$  is the difference between the mean standardised volume (alternatively change in the average market share of the IB on BSE) during the post period (day  $w$  through  $p+w$  after insider trade date) and pre period.  $\text{Tip}_{ijt}$  is a dummy variable that takes the value 1, if the abnormal market share (*AbnormalMS*) is positive and 0 otherwise. The directional net impact of tipping on the future activity through the broker would be evident from the sign of the coefficient  $\beta_1$ . We report the results for volumes averaged over a period ( $p$ ) of 40 trading days. Window of 11 ( $w=5$ ) is used. The results suggest that higher insider tipping activity is associated with a decrease in the overall trading during the subsequent period for insider buy events. No impact is noted for the insider sale events. We control for IB fixed effects and the standard errors are corrected for clustering at IB level. This provides evidence that *Repercussion* (subsection 5.2) is the dominant phenomenon for the tipping during insider buys and clients of the insider broker discipline the broker by reducing

their activity with her.

Next, we examine the pool of clients driving this effect. We expect that the clients who acted on the broker tip and profited as a result of mimicking the insider trades, would contribute to increase in *future gain* and hence demonstrate an increase in their trading activity with the broker. We do not exactly identify the accounts that traded on a broker tip but claim that these accounts belong to the pool of clients of the insider broker who traded in insiders firm, and in the same direction as that of the insider on the insider trade day (insider trade imitators (ITI)). The remaining insider brokers clients are classified as non-insider trade imitators (NITI). ITI and NITI represent the two account types (AT). We study the trading activity of these groups using the following regression:

$$\text{Diff\_MS}_{jt}^{\text{AT}} = \alpha + \beta_1 * \text{No\_Tip}_{ijt} + \beta_2 * \text{NITI}_{ijt} + \beta_3 * \text{NITI}_{ijt} * \text{No\_Tip}_{ijt} + \epsilon \quad (5)$$

The results for above regression are reported in Table 10. The dependent variable  $\text{Diff\_MS}_{jt}^{\text{AT}}$  is the change in the market share of the IB around insider trade. The pre and post time intervals over which the average market shares have been evaluated are similar to those used in equation 4. But these market shares have been separately evaluated for different account type (AT) - ITI and NITI. The variable  $\text{No\_Tip}_{ijt}$  is a dummy which takes value 1 if the IB did not demonstrate abnormal trading activity during insider trade and 0 otherwise.  $\text{NITI}_{ijt}$  is also a dummy that is 1 for accounts that did not imitate the insider trades on insider trading day through IB and 0 otherwise. The interaction term displays incremental contribution of the accounts that did not trade on a tip towards the increase in the IB's overall market share on BSE. A significant positive coefficient for the interaction term demonstrates that the non tipping IB's experience an increase in the overall contribution to the trades on BSE through the non-imitator accounts as compared to the IBs that tipped during the insider event. This provides evidence that the IBs that tip do not benefit in the near future because of their tips about insider trades. This alludes to the presence



of market disciplining mechanism for the tipping brokers owing to reduction in the insider trades and overall trading on BSE over the next few months.

## 6 Conclusion

Firm insiders trades have been considerably scrutinized and regulated. In many markets around the world, the insiders are prohibited to trade during blackout windows typically prior to earnings announcements of the firm. Also, short swing trades are not permitted. But, the intermediaries dealing with the insiders for execution of trades, receive information signal via these insider trades. Following an insider trade, there is an abnormal increase in the trading activity (market share) of the other clients of the insider broker. Also, a comparison of directional market share of insider brokers with other active brokers on the Bombay Stock Exchange, reveals that the insider brokers client activity is significantly higher in the insider traded stock. Also, the abnormal trading activity by an IB on insider trade days is significantly greater than their own historical trading activity in the insider's own firm stock. This conforms to the findings of McNally, Shkilko, and Smith (2015). They find that smaller brokers tend to tip more. And high value insider transactions lead to more tipping. We find that the largest clients of an insider broker do not contribute to the increase in trading activity in the insider firm stock around insider trade day which indicates that they do not receive the tip.

Further, we find that the future instances of insider trading reduce through the IBs that display higher abnormal trading during the insider trade. This effect persists over the subsequent 3 months. This essentially results in the loss of the source of information which the IB used for tipping. Even though tipping may benefit IB in the short run, the long term effects may not be favourable.

Lastly, we study the change in the overall BSE trading activity via insider broker depending on their tendency to tip. We find that post an insider buy trade which is accompanied by high level of tipping, the overall trading through brokers reduces. This is reflected through

a reduction in the trading activity through the broker on BSE. Furthermore, the IBs that did not tip during insider buys experience an increase in their market share on BSE.

This study provides insights into the preferential treatment of the brokers for a certain set of clients. Also, alludes to the presence of market disciplining mechanisms for intermediaries.

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TABLE 1: Basic Data Description

This table represents summary of the insider trades. *Total* represents the count of variables from the trades reported by an insider that are a part of our sample. *Matched* represents the data based on reported insider trades that were matched to an account on a day. *Identified* has all the trades through an identified insider account in the stock of her own company. *Filtered* is a subset of the *Identified* insider trades. Filtering criterion are elaborated in data construction. *Events* is the count of clubbed insider trades. The insider trades are considered as a part of a single unique event if a firm insider engages in similar position (only buy or only sale) of her own firm stock over consecutive trading days through the same broker. Accounts and Trading Members are determinable only for identified insider trades.

Variable	From Reported trades		From BSE Trades		
	Total	Matched	Identified	Filtered	Events
Number of insider trades	9,053	6,862	15,649	7,263	3,558
Number of insider purchase	6,265	4,817	10,860	4,428	2,082
Number of insider sale	2,788	2,045	4,789	2,835	1,476
Number of unique insiders	1,683	1,233	1,233	1,052	1,052
Number of insider accounts	-	1,393	1,393	1,180	1,180
Number of insider own company stocks	724	620	620	543	543
Number of Trading Members	-	328	328	294	294

TABLE 2: Summary Statistic

This table represents the summary statistic.

PANEL A					
Variable	Mean	Std. Dev.	Q1	Q2	Q3
Number of insider trade events per stock	6.55	8.02	2	4	8
Number of insider buy events per stock	5.39	6.53	1	3	7
Number of insider sell events per stock	5.07	7.01	1	2	6
Number of insiders per stock	2.00	1.74	1	1	2
Number of insider trade events per broker	12.10	19.80	2	6	15
Number of insider buy events per broker	8.82	13.08	1	4	11
Number of insider sell events per broker	7.61	12.40	2	4	8
Number of insiders per broker	3.93	5.38	1	2	5

PANEL B					
Variable	Mean	Std. Dev.	Q1	Q2	Q3
Insider stock volume during insider trading days	222,367	882,120	11,951	39,161	124,750
Insider stock volume during insider trading days (excluding insider trades)	176,881	796,614	4,310	21,744	86,858
Insider stock volume during non-insider trading days	130,085	767,192	3,289	15,877	68,639
IB's insider stock volume during insider trading days	74,253	474,532	3,000	9,350	30,000
IB's insider stock volume during insider trading days (excluding insider trades)	28,690	324,504	0	80	2,500
IB's insider stock volume during non-insider trading days	15,887	807,858	250	1,200	5,500
Non-IB's insider stock volume on insider trading days	6,304	82,349	100	500	2,020
Non IB's insider stock volume on non-insider trading days	5,200	72,812	100	500	2,000

**TABLE 3: Time Series of Insider Brokers' trading around Insider Trade**

This represents the univariate for Market Share (MS), which is a measure for insider brokers' buying (selling) activity during insider buy (sell) event. Market share is proportional transaction volume of insider broker as compared to total BSE volume, excluding the insider trades, in the insider's own firm stock. Following McNally, Shkilko, and Smith (2015), a benchmark period of 40 days, 20 days prior to insider trade is considered. MS<sub>IE</sub> is the market share of the insider broker (in insider's own company) during insider event. MS<sub>Bench</sub> is the benchmark market share. *Diff* represents the difference between MS<sub>IE</sub> and MS<sub>Bench</sub>. *t-stat* reports the value of t-statistic.

Ref Date	Insider Buy Event				Insider Sell Event			
	MS <sub>IE</sub> (1)	MS <sub>Bench</sub> (2)	Diff (1)-(2)	t-stat (3)	MS <sub>IE</sub> (1)	MS <sub>Bench</sub> (2)	Diff (1)-(2)	t-stat (3)
-2	0.048	0.048	0.001	0.141	0.027	0.021	0.006	2.350
-1	0.047	0.047	0.000	0.002	0.031	0.021	0.009	3.391
<b>0</b>	<b>0.087</b>	<b>0.048</b>	<b>0.039</b>	<b>8.790</b>	<b>0.054</b>	<b>0.021</b>	<b>0.032</b>	<b>8.703</b>
1	0.046	0.048	-0.002	-0.591	0.025	0.022	0.003	1.470
2	0.045	0.048	-0.003	-0.829	0.028	0.022	0.006	2.198

TABLE 4: Standardized volumes of broker around Insider Trades

This table reports estimated coefficients of regression done to examine the incremental effect on *standardized volume* (dependent variable) of accounts due to common broker with a company insider, post an insider trades. Standardized volume is evaluated as the fraction of day level aggregated transaction volume (in insider traded stock) for an account. *Post* is a dummy for date. It takes a value 1 for insider trade date and days after that and a value of 0 for the days preceding insider trade. *Shared Broker* is a dummy that takes value 1 for insider broker and 0 for other brokers. \*\*\*, \*\*, \* represents statistical significance at the 1%, 5% and 10% levels. *window* if the number of days considered around the insider trade date.

Independent Variable	Insider Purchase Event				Insider Sale Event			
<i>Post</i>	-0.0036*** (-16.16)	-0.0032*** (-29.82)	-0.0018*** (-13.86)	-0.0014*** (-24.40)	-0.0014*** (-12.71)	-0.0013*** (-23.01)	-0.0006*** (-9.90)	-0.0005*** (-18.64)
<i>Shared Broker</i>	0.0464*** (7.93)	0.0396*** (9.81)	0.0456*** (7.95)	0.0375*** (13.05)	0.0180*** (6.04)	0.0189*** (7.28)	0.0172*** (6.47)	0.0178*** (8.74)
<i>Post * Shared Broker</i>	0.0205*** (3.73)	0.0217*** (4.39)	0.0093*** (3.09)	0.0101*** (3.11)	0.0135*** (3.30)	0.0134*** (3.87)	0.0066*** (3.08)	0.0067*** (2.95)
<i>Intercept</i>	0.0081*** (49.29)	0.0079*** (103.49)	0.0080*** (83.50)	0.0078*** (204.05)	0.0050*** (66.42)	0.0049*** (133.71)	0.0049*** (123.01)	0.0049*** (272.88)
<i>Window</i>	2	2	6	6	2	2	6	6
<i>Exclude 1 day before event</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>TM Fixed Effects</i>	Yes	No	Yes	No	Yes	No	Yes	No
<i>Event FE</i>	No	Yes	No	Yes	No	Yes	No	Yes
<i>No. of Obs.</i>	734,062	734,062	1,639,321	1,639,321	817,606	817,606	1,948,855	1,948,855
<i>R2 Adj.</i>	0.0410	0.0441	0.0309	0.0411	0.0364	0.0198	0.0328	0.0207

TABLE 5: Descriptive Statistics of Imitator Account Category

This table provides the distribution of clients of the insider broker. This captures a sub-sample of client accounts of insider broker that imitate the insider trade during insider trade event. Imitation of insider trade implies that the account carried out a transaction in the insider's own firm stock, during insider event via the insider's broker. The accounts are categorized as Retail, Institution or Others. In Panel B, *Count* is the number of insider events during which atleast one account (of the concerned account category) traded.

PANEL A						
Variable	Value					
Number of Insider Trade Events With Imitators	1,843					
Number of Insider Trade Events without Missing Categories	1,648					
Number of Retail Imitator Accounts	11,101					
Number of Institutional Imitator Accounts	17					
Number of Other Imitator Accounts	290					

PANEL B						
Variable	Count	Mean	Std. Dev.	Q1	Q2	Q3
Volume of Retail Imitators	1,547	18,430	130,721	250	1,155	6,038
Volume of Institutional Imitators	28	31,556	95,998	50	514	7,879
Volume of Other Imitators	320	82,530	555,553	525	2,996	15,000

**TABLE 6:** Contribution of most active accounts of insider broker to abnormal trading activity

This displays the estimated coefficients for regression for abnormal market share with the most active investors of the insider broker. Abnormal market share is the difference in the directional trading volume of insider broker (excluding insider trades) on the insider trade date within insider's own firm stock and a similar value measured over a benchmark period prior to the insider trade. The directional trading volumes are standardized by the total trading in the insider's own firm stock on a given day. The benchmark is evaluated over a period of 40 days (starting 60 days prior to insider trade date and ending 20 days prior). *High Rank* is a dummy variable that takes the value 1 if an account belongs to the decile specified in "*Decile with High Rank = 1*" and 0 otherwise. Each account is ranked based on the aggregated trading activity (volume) of the account during the benchmark period specified in "*No. of days in benchmark period*". These are then divided into deciles; most active accounts in the highest decile and so on. *Log Insider Vol* is the volume traded by the insider in her own firm. *TM FE* is the trading member fixed effects. \*\*\*, \*\*, \* represents statistical significance at the 1%, 5% and 10% levels.

Independent Variable	Insider Purchase Event				Insider Sale Event			
	40	40	20	20	40	40	20	20
<i>No. of days in benchmark period</i>	40	40	20	20	40	40	20	20
<i>Decile with High Rank=1</i>	>8 <sup>th</sup>	>6 <sup>th</sup>	>8 <sup>th</sup>	>6 <sup>th</sup>	>8 <sup>th</sup>	>6 <sup>th</sup>	>8 <sup>th</sup>	>6 <sup>th</sup>
<i>High Rank</i>	-0.056***	-0.071***	-0.055***	-0.060***	-0.012***	-0.017***	-0.016***	-0.017***
	(-8.74)	(-9.95)	(-9.07)	(-9.50)	(-6.73)	(-8.25)	(-8.82)	(-9.40)
<i>Average Lagged MS</i>	0.983***	0.983***	0.984***	0.983***	1.110***	1.110***	1.110***	1.109***
	(23.5)	(23.5)	(23.53)	(23.54)	(32.44)	(32.4)	(32.52)	(32.50)
<i>Log Insider Vol</i>	0.026***	0.026***	0.026***	0.026***	0.007***	0.007***	0.007***	0.007***
	(12.6)	(12.4)	(12.48)	(12.43)	(17.18)	(17.08)	(17.19)	(17.14)
<i>Intercept</i>	-0.087***	-0.08***	-0.087***	-0.081***	-0.023***	-0.025***	-0.027***	-0.025***
	(-3.93)	(-3.05)	(-3.92)	(-3.66)	(-6.58)	(-5.33)	(-6.09)	(-5.61)
<i>TM FE</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Adj. R2</i>	0.53	0.54	0.535	0.536	0.416	0.417	0.417	0.418
<i>No. of Obs.</i>	4656	4656	4656	4656	12091	12091	12091	12091



**TABLE 7:** Impact of Tipping on number of future insider trades through the insider broker

The dependent variable is, number of future insider trade instances (over a period of 3 months or 6 months) through an insider broker post an insider trade. The explanatory variable is the abnormal market share (*Abnormal MS*) during the insider trade which is a measure of tipping by the insider broker. Abnormal market share is evaluated as per the details in section 5. \*\*\*, \*\*, \* represents statistical significance at the 1%, 5% and 10% levels.

Independent Variable	3 months		6 months	
<i>Abnormal MS</i>	-0.82*** (-5.36)	-0.37** (-2.11)	-1.05*** (-4.51)	-0.36 (-1.28)
<i>Intercept</i>	1.67*** (54.48)	1.65*** (198.67)	2.48*** (52.86)	2.44*** (185.57)
<i>Firm Fixed Effect</i>	No	Yes	No	Yes
<i>Adj. R2</i>	0.006	0.301	0.004	0.374
<i>No. of Obs.</i>	4506	4506	4506	4506

TABLE 8: Summary Statistics: Future trades by non-insider clients

This table contains the summary statistic for the change in contribution of insider broker in the overall trading activity on BSE around insider trade date. The *Overall Market Share* of a broker is daily standardised trading volume through the broker. The daily BSE trading volume is utilised for standardization. The pre-period market share of a broker is evaluated as the average of daily market shares over a period of 40 days, ending 5 days prior to insider trading day. Similarly, post-period market share is evaluated over 40 days, starting 5 days after insider trade day. The *Difference in market share* is evaluated as the difference in post-period market share and pre-period market share. The *Single Trade Insider Brokers* are the brokers that carried out just the insider's trade on the given insider trade day i.e. no other account engaged in similar position as that of the insider through these brokers on that day. *Potentially Tipping Brokers (PTB)* are the brokers that have engaged in tipping during insider trade days based on two Criterion- *C1* and *C2*. As per *C1*, an insider broker is classified as PTB if the market share of the broker on insider trade day is greater than that during the benchmark i.e. Abnormal MS (as elaborated in section 5) is positive. As per *C2*, the insider broker is classified as PTB if the market share of the broker on insider trade day is greater than one standard deviation above the mean market share evaluated during the benchmark period. *Imitator Accounts* are the accounts of the insider broker that engage in positions similar to that of the insider on insider trading days through the insider's broker. \*Interpret the values post dividing them by 10000.

Variable	Mean*	Std Div*	t-stat	N
Difference in overall market share of insider brokers around insider trade	<b>0.1801</b>	2.5534	4.19	3,521
Difference in overall market share of single trade insider brokers around insider trades	<b>0.1244</b>	2.2382	2.29	1,691
Difference in overall market share of potentially tipping brokers (C1)	<b>0.2052</b>	2.6652	2.61	1,152
Difference in overall market share of potentially tipping brokers (C2)	<b>0.2136</b>	2.4435	2.35	726
Difference in overall market share of imitator accounts for all insider brokers	0.0038	0.5684	0.28	1,757
Difference in overall market share of potentially tipping brokers (C1) owing to imitator accounts	0.0238	0.5022	1.55	1,077
Difference in overall market share of potentially tipping brokers (C2) owing to imitator accounts	0.0363	0.6266	1.48	656

TABLE 9: Impact of Tipping on Future Trading Activity of Insider Broker

The dependent variable is *Difference in Overall Market Share* ( $Diff\_MS_{jt}$ ), which is evaluated as the change in the overall contribution of the broker to the trading activity on BSE. The *Overall Market Share* of a broker is daily standardised trading volume through the broker. The daily BSE trading volume is utilised for standardization. The pre-period market share of a broker is evaluated as the average of daily market shares over a period of 40 days, ending 5 days prior to insider trading day. Similarly, post-period market share is evaluated over 40 days, starting 5 days after insider trade day. The *Difference in Overall Market Share* is evaluated as the difference in post-period market share and pre-period market share. *Tip* is a dummy that takes value 1 if the *Abnormal MS* during insider trade day is positive. *Abnormal MS* is evaluated as explained in section 5. \*\*\*, \*\*, \* represents statistical significance at the 1%, 5% and 10% levels.

Independent Variable	Buy	Sale
<i>Tip</i>	-0.0027* (-1.66)	0.0012 (0.52)
<i>Intercept</i>	0.0023*** (4.41)	0.0019*** (2.29)
<i>IB Fixed Effect</i>	Yes	Yes
<i>IB Clustered</i>	Yes	Yes
<i>Adj. R<sup>2</sup></i>	0.0609	0.00631
<i>No. of. Obs.</i>	2053	1468

**TABLE 10: Impact of Tipping on Future Trading Activity of Insider Broker owing to Non-Imitator Clients**

The dependent variable is *Difference in Overall Market Share*, which is evaluated as the change in the overall contribution of the broker to the trading activity on BSE. The *Overall Market Share* of a broker is daily standardised trading volume through the broker. The daily BSE trading volume is utilised for standardization. The pre-period market share of a broker is evaluated as the average of daily market shares over a period of 40 days, ending 5 days prior to insider trading day. Similarly, post-period market share is evaluated over 40 days, starting 5 days after insider trade day. The *Difference in market share* is evaluated as the difference in post-period market share and pre-period market share. *No Tip* is a dummy that takes value 1 if the *Abnormal MS* during insider trade day is not positive. *Abnormal MS* is evaluated as explained in section 5. *Insider Trade Imitator (ITI)* is a client who engages in similar positions as that of the insider through insider’s broker on the insider trade day. *NITI* is a dummy which takes value 1 if the client did not imitate the insider trade. Fixed effects are evaluated at insider broker (IB) level. \*\*\*, \*\*, \* represents statistical significance at the 1%, 5% and 10% levels.

Independent Variable	Buy	Sale
<i>NITI</i>	0.00002 (0.21)	0.00025 (0.89)
<i>No Tip</i>	0.00000 (0.03)	-0.00018 (-1.51)
<i>NITI*No Tip</i>	0.00027* (1.88)	0.00016 (0.92)
<i>Intercept</i>	-0.00005 (-0.60)	0.00004 (0.30)
<i>IB Fixed Effect</i>	Yes	Yes
<i>IB Clustered</i>	Yes	Yes
<i>Adj. R2</i>	0.0324	0.00118
<i>No. of. Obs.</i>	2935	2343

Figure 1: CONCENTRATION OF INSIDER OWN FIRM STOCKS

The horizontal axis represents date from Day -5 to Day 5 around insider trade day and the vertical axis represents log values of Herfindahl-Hirschman Index (HHI) of insider own firm stocks. For the insider traded stock  $s$ , the daily fraction of total volume (transaction value) traded through a broker and total volume (transaction value) traded on BSE is evaluated. The volume (transaction value) based HHI of Insider Firm Stocks is evaluated as the sum of squared daily fractions in terms of percentage.

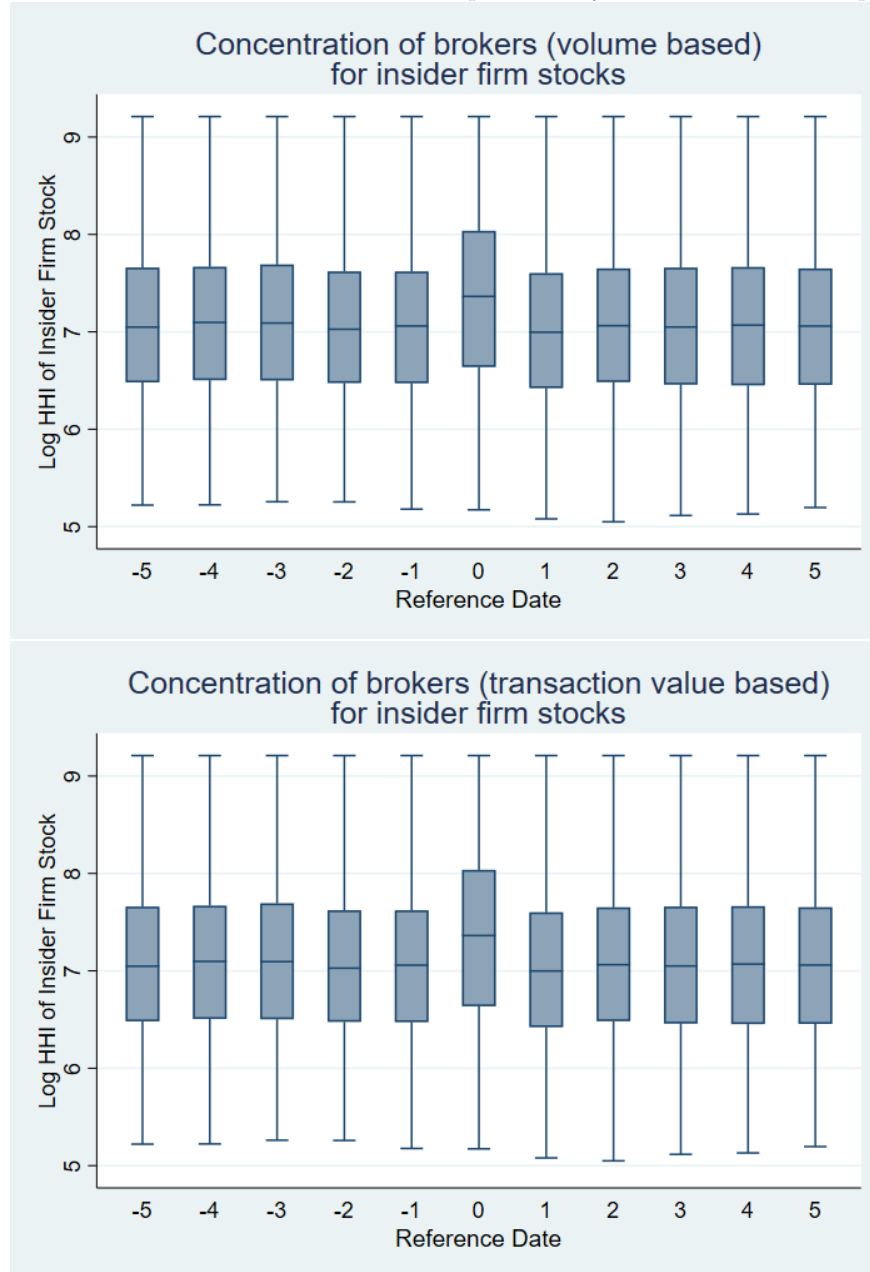


Figure 2: CONCENTRATION OF INSIDER BROKERS

The horizontal axis represents date from Day -5 to Day 5 around insider trade day and the vertical axis represents log values of Herfindahl-Hirschman Index (HHI) of Insider Broker. For the insider broker *IB*, the daily fraction of total volume (transaction value) particular stock and total volume (transaction value) traded through IB is evaluated. The volume (transaction value) based HHI of Insider broker is calculated as the sum of squared daily fractions in terms of percentage.

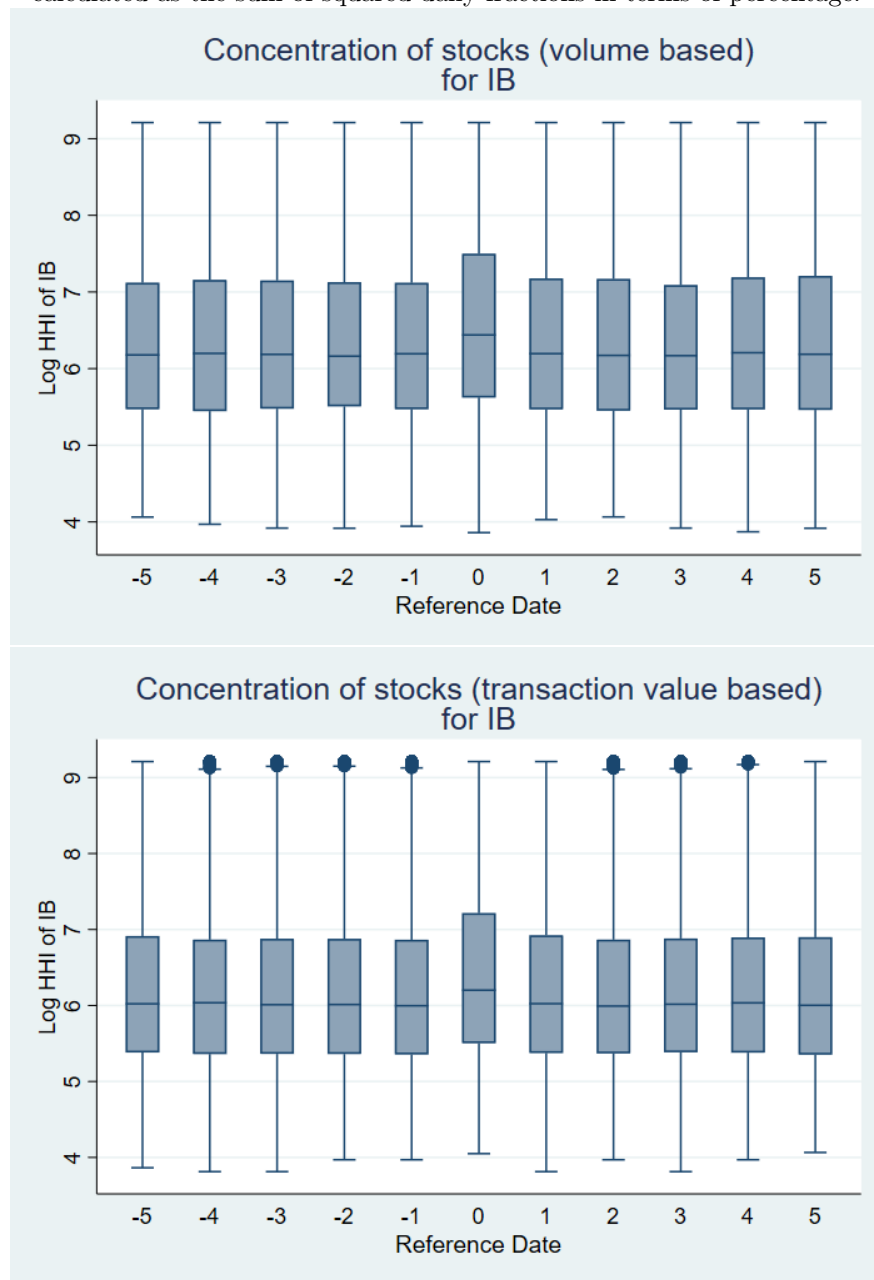


Figure 3: MARKET SHARE OF INSIDER BROKER AROUND INSIDER TRADE

The horizontal axis represents date from Day -5 to Day 5 around insider trade day and the vertical axis represents market share of the insider broker in the insider's own firm stock.  $MS_{ijt}^{bs}$  is defined as the fraction of directional volume of stock  $i$  traded through a broker  $j$  ( $\nu_{ijt}^{bs}$ ) within the total directional volume of stock  $j$  traded on BSE on day  $t$  ( $V_{it}^{bs}$ )

