Mimicking insider trades

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We thank Allan Hodgson, Amit Goyal, Anand Venkateswaran, Ephraim Clark, Hava Orkut, Hisham Farag, Jason Cen, Jayant Kale, Jayati Sarkar, Khine Kyaw, Lauren Cohen, Mike Jones, Patrick McColgan, Rafaelle Corvino, Sanjay Bhagat, Subrata Sarkar, Sugato Bhattacharya, and Usman Ali for helpful comments and suggestions. We also thank seminar participants and discussants at the 2020 Journal of Corporate Finance Special Issue Conference on "Corporate Failures", 2019 Young Finance Scholars' Conference, 2019 Essex Finance Centre (EFiC) Conference in Banking and Finance, 2019 Financial Engineering and Banking Society (FEBS) International Conference, 2018 Behavioural Finance Working Group (BFWG) Conference, 2018 International Accounting and Finance Doctoral Symposium (IAFDS), 2018 National Stock Exchange (NSE)-Indira Gandhi Institute of Developmental Research (IGIDR) Conference on Corporate Governance, 2018 European Financial Management Association (EFMA) Annual Meetings, 2018 British Accounting and Finance Association (BAFA) Annual Meetings, 2018 BAFA Scottish Area Group Conference, University of Strathclyde, and University of Greenwich. Andrew and Biwesh also gratefully acknowledge the research support provided by the National Stock Exchange (NSE) of India and Indira Gandhi Institute of Development Research (IGIDR) Corporate Governance Research Initiative 2017.

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Abstract

We examine whether outside investors mimic insider trades by analyzing the daily transactions of foreign institutional investors (FII) in the Indian emerging market. We find that the value relevance of insiders' opportunistic buy trades is much higher in our context relative to that reported for developed markets. More importantly, we find that FII mimic opportunistic buy trades, which is more pronounced for firms that are informationally more opaque or have lower corporate governance quality. A long-short strategy based on FII's transactions after opportunistic trades generates an additional abnormal return of approximately 29% annually, compared to transactions based on routines trades.

Keywords: Foreign institutional investors, information asymmetry, mimicking, opportunistic insider trades, routine insider trades

JEL Classifications: G14, G15, G40, K22

1 Introduction

We test whether foreign institutional investors (FII) exploit information generated by insider trades. Our study draws motivation from two different strands of finance literature. First, a sizeable body of studies supports the view that corporate insiders, such as managers and boards of directors, earn superior abnormal returns by trading their firms' stocks, particularly through their buy trades (Lakonishok and Lee, 2001; Jeng, Metrick, and Zeckhauser, 2003; Ke, Huddart, and Petroni, 2003; Piotroski and Roulstone, 2005).[1] More recently, there has been an increased focus in trying to distinguish insider transactions into opportunistic and routine trades to assess their relative value relevance. In general, studies report that opportunistic trades convey significant information about firms' future performance, but routine trades are predictable and driven by hedging, diversification, or liquidity needs. Additionally, the findings from these studies show that portfolios based on opportunistic trades generate higher abnormal returns compared to portfolios based on routine trades (Cohen, Malloy, and Pomorski, 2012; Ali and Hirshleifer, 2017).

Second, we rely on the literature that examines the trading behavior of FII's equity investment. FII's investment in equity markets is considered to be volatile, highly reversible and driven by cyclical factors (Hattari and Rajan, 2011).[2] Although Seasholes (2000) and Bailey, Mao, and Sirodom (2007) show that foreign investors have superior information processing ability, there is a much larger body of literature argues that relative to their domestic counterparts, FII are at an information disadvantage in emerging markets, i.e., FII possess lower levels of relevant information (Choe, Kho, and Stulz, 2005; Dvořák, 2005; Agarwal et al., 2009; Leuz, Lins, and Warnock, 2009; Kang and Kim, 2010; Bell, Filatotchev, and Rasheed, 2012; Baik et al., 2013). Such information asymmetry stems from physical, linguistic, or cultural barriers resulting in suboptimal investments

[1] For instance, Lakonishok and Lee (2001) report a portfolio return of 4.8% for stocks with insider buys. Jeng, Metrick, and Zeckhauser (2003) similarly show annual abnormal returns of more than 6% for insider purchases.
[2] FII refers to any entity established or incorporated outside India that makes investment in Indian registered securities. These investors include market participants such as mutual funds, investment trusts, insurance/reinsurance companies, banks, asset management companies, investment managers/advisors, portfolio managers, and pension funds.

(Chan, Covrig, and Ng, 2005; Bell, Filatotchev, and Rasheed, 2012). Prior literature suggests that FII attempt to overcome this informational disadvantage by better utilizing the information available from the public (e.g. corporate disclosures) and private sources. For example, Seasholes (2000) argues that FII tend to buy (sell) before good (bad) earnings announcements. Similarly, Bailey, Mao, and Sirodom (2007) suggest that FII's trading before and after earnings announcements is due to their superior information processing ability. Deng, Li, and Li (2018) also argue that FII leverage their management expertise to carefully identify investment targets.

Despite the voluminous literature on insider trading, there is scant empirical evidence on how information on insider trades is used by other market participants, particularly informationally disadvantaged outside investors, such as FII. Cohen, Malloy, and Pomorski (2012) provide some preliminary evidence of institutional investors following insider trades and highlight this issue as a promising avenue for future research.[3] Our paper attempts to fill this gap by exploiting a unique trade-level dataset that allows us to observe every single trade of FII in India. Using this trade-level granular dataset, we perform our empirical analyses around two key issues. First, we test whether FII mimic insider trades, and in particular the more informative opportunistic trades. Given the higher informational content of opportunistic trades and the informational asymmetry FII encounter in emerging markets, we hypothesize that FII are more likely to follow opportunistic traders. We refer to this as the "mimicking hypothesis".

Second, we investigate the profitability of the mimicking strategy. The literature provides conflicting evidence that investment strategies built around insider trades are profitable (Seyhun, 1986; Rozeff and Zaman, 1988; Bettis, Vickrey, and Vickrey, 1997). We empirically test the profitability issue by examining portfolio returns based on the trades executed by the mimickers.

[3] To investigate the link between insider trades and institutional investor trading, Cohen, Malloy, and Pomorski (2012) regress the change in institutional ownership on the number of opportunistic and routine trades in that stock in the past two quarters. This approach has two important limitations. First, quarterly changes in institutional holdings may not fully reflect inter-quarter institutional trading and hence are unlikely to capture the immediate reaction by institutional investors to insider trades. Second, the number of trades in past quarters may not capture the intensity of insider trading as a single large opportunistic trade may have a significant impact on the institutional trading.

Since FII are disadvantaged by information asymmetry and insider trades can disclose significant value relevant information, we hypothesize that FII that follow insider traders, particularly the opportunistic ones, should earn abnormal returns on their investments.

We consider India as an appropriate setting for our study for several reasons. First, the information content of insider trades in emerging markets should potentially be more informative to outsiders, as these markets, relative to their developed counterparts, exhibit higher informational inefficiency, greater macro and micro opaqueness, higher concentrated ownership, and more lax enforcement of insider trading regulations (Khanna and Palepu, 2000; Allen, Qian, and Qian, 2005; Gelos and Wei, 2005; Khwaja and Mian, 2005; Bhaumik and Selarka, 2012).[4] Furthermore, Fernandes and Ferreira (2009) show that enforcement of insider trading rules does not increase price informativeness in an emerging market and that insider trading plays a more important role in price discovery in these markets relative to developed markets. Hence, we argue that insider trading in emerging markets should be more valuable and strongly predict future returns.

Second, the regulation that governs insider trading in India, namely the Prohibition of Insider Trading 1992, is not as stringent as it is in the US and other developed markets (Beny, 2005). In this context, Dennis and Xu (2013) show that the Insider Trading Restriction (ITR) Index and Insider Trading Law (ITL) index (developed by Beny, 2004; 2006) are both very low for India.[5] Although Bhattacharya and Daouk (2002) recognize India as one of the emerging markets with the presence of insider trading enforcement (proxied by prosecutions), Bushman, Piotroski, and Smith (2005) show that enforcement of insider trading restrictions fails to capture substantial differences in the nature of the insider trading laws and related enforcement mechanisms. Thus, we argue that insiders in India are more likely to trade on their private information, rendering these trades as a useful signal on the prospects of their firms.

[4] For example, Bhattacharya et al. (2000) and Bhattacharya and Daouk (2002) suggest that a lack of strict insider trading regulations and a lower likelihood of prosecutions in emerging markets encourages insiders to trade on their private information.

[5] For instance, out of the 41 countries examined, India ranked 34th in ITR index (Luxembourg – 6.22; Denmark – 6, UK – 5.85, US – 5.64, average = 4.48, India – 3.53).

Third, and as mentioned before, the Indian setting provides us with a unique database that allows us to examine the immediate reaction of FII following insider trades. To the best of our knowledge, this is the most comprehensive trade-level institutional trading data that is available in the public domain. Fourth, our setting is also important in an economic sense. The Indian equity market is a large and attractive destination for FII, which over the past decade has witnessed significant growth in FII's equity investments.[6] Finally, the Indian market is similar in characteristics to other emerging markets, such as high ownership concentration, lower investor protection standards, and weaker environment of legal enforcement (Claessens, Djankov, and Lang, 2000; Gaur and Kumar, 2009; Gopalan and Gormley, 2013). Our results, particularly related to the trading behavior of FII, could be generalized to those emerging markets that share these common characteristics.

We begin our analysis by classifying insider trades into routine and opportunistic trades using the Cohen, Malloy, and Pomorski (2012) approach. A *routine trader* places a trade in the same calendar month for at least three consecutive years. All other insiders are categorized as *opportunistic traders.*[7] We find that insider trades, particularly opportunistic buy trades, are a significant predictor of future returns. Overall, our results show that the incremental predictive ability of opportunistic trades is approximately 243 basis points per month relative to routine trades. This is much larger than the 158 basis points reported by Cohen, Malloy, and Pomorski (2012) for US insider trades. In our case, opportunistic buy trades alone earn, on average, an incremental return of 160 basis points in the following month. Consistent with prior studies, we do not find the predictive ability of other

[6] India was ranked 9th in the world at the end of 2018 in terms of market capitalization, 4th in terms of country weights in the MSCI Emerging Markets Index. Net investment by FII in Indian equity market has grown from INR 440 billion (approximately US$9.6 billion) in 2003-04 to INR 1,102 billion (approximately US$18.01 billion) in 2014-15 (Source: Reserve Bank of India). FII in India hold around 40% of freely floated shares (Crabtree, 2015). Also, see "India is the jewel in the emerging market crown", *Financial Times*, May 31, 2015; "Faster growing India confirmed as most dynamic emerging market", *Financial Times*, May 31, 2016.

[7] This approach has gained increasing acceptance in the insider trading literature. For example, Khan and Lu (2013), Jia, Lent, and Zeng (2014), Reeb, Zhang, and Zhao (2014), Cline, Gokkaya, and Liu (2017), Hong and Li (2018), Goergen, Renneboog, and Zhao (2019), Lee and Piqueira (2019), Drobetz, Mussbach, and Westheide (2020), Contreras and Marcet (2020), Dang et al. (2020) and Fu et al. (2020) follow this classification of insider trading. Many of these recent studies are supportive of its use in their results.

insider trades (opportunistic sell and routine trades) to be significant, both in statistical and economic terms.

We then set out to test the mimicking behavior and find that trades by FII are positively related to past opportunistic insider buy trades. These opportunistic buy driven FII's trades are economically significant. Specifically, a one-standard-deviation (29.41 basis points) positive shift in opportunistic insider buy trades boosts FII's daily net trading by 0.1176 basis points over the 30 days following the disclosure of the insider trades. This translates to an average (median) daily net trading value of INR 4.47 million (0.68 million). This incremental value is approximately equal to (three times) the daily average (median) FII trading over our entire sample period. Further, the economic significance of the relation between FII trades and opportunistic buys is even more pronounced for the more informative large insider trades. Quantitatively, a one-standard-deviation (60.33 basis points) increase in large opportunistic buy trades approximately results in an increase in the average (median) daily FII trading value of INR 13.07 million (1.94 million). Not surprisingly, we fail to find any economically or statistically significant relation of FII trading with both opportunistic sells and routine insider trades.

We address potential endogeneity concern of our mimicking results in two ways. First, we examine reverse causality and test whether our results are driven by the opportunistic (routine) insiders' reaction to past FII trades. The empirical estimations do not show statistically significant and economically material link between insider trades (both opportunistic and routine) and past FII trading. Second, we conduct a difference-in-differences (DiD) analysis of FII trading between a treatment group (firms with insider trading) and a propensity-matched control group (firms without insider trading) before and after the disclosure of insider trades. We find that compared to the control firms, FII trading is immediate and in the same direction as that of opportunistic buy trades in the treatment firms, lending further support to the mimicking hypothesis.

We also examine cross-sectional variations in mimicking behavior by analyzing the firm-specific information environment and the quality of corporate governance. As the disclosure of

opportunistic trades is likely to reduce information asymmetry, we expect the mimicking to be more pronounced in firms that are informationally more opaque and weaker in corporate governance quality. Consistent with this economic conjecture, we find that mimicking is stronger in firms with relatively higher price synchronicity, higher illiquidity, and higher insider ownership. Similarly, mimicking is significantly lower in firms that are cross-listed.[8]

Schmidt (2019) finds that institutional investors pay more attention to announcements relating to stocks in their own portfolios. We examine this possibility in our context by classifying FII into existing, past, and new shareholders. Consistent with this economic prediction, we find that it is predominantly existing FII that follow insider trades. Although few new FII also trade following the disclosure, we do not find any support for the mimicking hypothesis for past FII.

As an additional test, we also consider delays in reporting insider trades as past studies suggest that trades that are reported late contain more information and cause price distortion (Carter, Mansi, and Reeb, 2003; Betzer and Theissen, 2010). We find that almost 85% of the insider trades in our sample are reported within seven days of the transaction. Interestingly, the majority of the reporting delays in India are related to sell transactions. Although opportunistic buy trades that are reported late appear to contain more information, mimicking tests using delayed trades do not yield any statistically significant results, potentially due to a smaller subsample size.

Finally, we examine the abnormal returns of the mimickers. We undertake a calendar-time portfolio analysis and evaluate the risk-adjusted portfolio returns for FII trades following opportunistic and routine insider trades. We compute raw returns and the market-adjusted returns as well as the Capital Asset Pricing Model (CAPM), three-factors- and four-factors-based intercept (alpha) returns. Our results strongly suggest that trades conducted by FII following opportunistic buy trades earn significantly higher abnormal returns compared to the trades conducted after routine

[8] Consistent with the assertion of the bonding hypothesis, prior studies show that internationally cross-listed firms, principally from emerging markets, by complying with the stringent corporate governance regulations of the developed markets, exhibit superior corporate governance practices relative to domestically listed firms (Stulz, 1999; Coffee, 2002; Karolyi, 2012).

buys. Furthermore, a long-short strategy on FII trades that mimics opportunistic insider trades generates an additional annual adjusted return of 29% compared to a long-short strategy that mimics routine trades. On the other hand, portfolios based on FII trades following opportunistic and routine sell trades do not yield any significant returns. Collectively, these results suggest that FII who mimic opportunistic buy trades earn substantially higher returns compared to FII who follow other insider trades.

We perform a battery of robustness tests to tender greater confidence in the mimicking hypothesis and return-based findings. First, we consider our results in a period after the change in insider trading regulation in India in May 2015. Consistent with theoretical expectations, we find that the enforcement of stricter insider trading regulation reduces both, the information content of opportunistic insider trades and the extent of mimicking by FII. Second, as an alternative to using the Cohen, Malloy, and Pomorski (2012) measure we rerun our analysis using Ali and Hirshleifer's (2017) definition of opportunistic trading, which is based on the profitability of insider pre-quarterly earnings announcement (QEA) trades.[9] We find that our results based on this alternative measure are qualitatively similar to those using the Cohen, Malloy, and Pomorski (2012) measure. Third, the results of the mimicking hypothesis and the abnormal returns of the mimickers are also robust to the use of the trade-level definition of opportunistic and routine insider trades as well as a more stringent definition of opportunistic and routine insider trades. Fourth, we find that the mimicking hypothesis holds when we use the changes in quarterly ownership (holdings) as an alternative measure of FII trading. Finally, the results on the mimicking hypothesis are also robust to concerns of window dressing and portfolio pumping by FII.

Our paper makes two important contributions to the literature. First, we add to the literature that focuses on outsiders' response to insider trades (Cornell and Sirri, 1992; Bettis, Vickrey, and Vickrey, 1997; Chang and Suk, 1998). Although Cohen, Malloy, and Pomorski (2012) provide

[9] The insiders with high profit from their pre-quarterly earnings trades are identified as opportunistic insiders. This classification strategy has also been used in the academic literature (see Fu et al., 2020).

suggestive evidence that institutional investors may follow past opportunistic insider trades, we contribute to this literature by providing systematic and robust empirical evidence of outsiders, particularly most informationally disadvantaged ones, mimicking the trades of informed insiders. More specifically, our evidence informs on the importance of insider traders to the informationally disadvantaged FII. Studies note that although FII are sophisticated investors with superior information processing ability (Seasholes, 2000; Bailey, Mao, and Sirodom, 2007), they are also at severe information disadvantage in emerging market (Dvořák, 2005; Agarwal et al., 2009; Leuz, Lins, and Warnock, 2009). As such FII may overcome the issue of severe information asymmetry by effectively utilizing public information (Bailey, Mao, and Sirodom, 2007). In this study, we contribute to this strand of literature by offering systematic evidence that international portfolio investors in emerging markets effectively exploit high-level information content of insider trading to overcome the friction of information asymmetry.

Second, our study further extends the literature on the prospect of profitability following insider trades (Lakonishok and Lee, 2001; Jeng, Metrick, and Zeckhauser, 2003; Ke, Huddart, and Petroni, 2003; Piotroski and Roulstone, 2005; Collin-Dufresne and Fos, 2015). For example, our initial findings on the information content of insider trading is supportive of Collin-Dufresne and Fos (2015). Collin-Dufresne and Fos (2015) show that the announcement of Schedule 13D filing (by insiders and activist investors) generates a significant alpha return, and their key objective is to examine whether liquidity measures show the presence of informed trading. However, unlike Collin-Dufresne and Fos (2015) and other studies, we do not replicate the Schedule 13D filers or the insider trades. We empirically investigate the profitability of actual trades, after disclosure of opportunistic insider trades, by one of the most informationally disadvantageous outside investors, i.e. FII, particularly in the context of relatively inefficient and opaque emerging markets. Our findings that FII do exploit a high level of information content of insider trading to earn significantly higher adjusted returns significantly improves our understanding of the profitability of mimicking trades around insider trading.

This paper proceeds as follows: Section 2 describes our data, main variables, and summary statistics. Section 3 examines the information content of insider trades. Section 4 investigates the mimicking hypothesis and Section 5 reports the abnormal return of the mimickers. Section 6 offers several robustness tests, and Section 7 concludes the paper.

2 Data and summary statistics

2.1 Data

Our data is drawn from several sources. We collect the publicly available insider trading data from the Bombay Stock Exchange (BSE).[10] This dataset provides information on firm identification (name and security code), acquirer name, the mode of trade (open market transactions, employee stock ownership plans, and gifts, etc.), the quantity of trade, side of the trade (buy or sell), trade date, and reported date. Although the database reports data from 1990 onwards, almost 99.99% of transactions are conducted after 2004. Therefore, we exclude insider trading data prior to 2004. Further, we limit our analysis to the end of 2014 for two reasons. First, in January 2015, the Securities and Exchange Board of India (SEBI) introduced a new insider trading regulation that is significantly broader in scope.[11] Second, FII's equity trading was significantly affected by a proposed change in tax regulation in early 2015 and this additional tax demand by the Indian government led to massive withdrawals by FII from the Indian market.[12] Given that these two events could potentially affect the trading behavior of both insiders and FII, we conduct our empirical analyses over the 2004 – 2014 period. Since the classification of insider trades requires historical trading data for at least three years, our partitionable universe (trades which are classified as either routine or opportunistic) of insider trading ranges from 2007 – 2014.

[10] http://www.bseindia.com/corporates/Insider_Trading.aspx

[11] We also examine the insider trading in the period after this change in insider trading regulation. See section 6.1 for more details.

[12] "100 FII get tax notices for $6bn, say it's retrospective", *The Economic Times*, April 6, 2015; "India on collision course with investor over $6.4 billion tax target", *Financial Times*, April 15, 2015; "How to end India's Tax Terrorism", Bloomberg, April 17, 2015 and, "SEBI backs foreign portfolio investors, raises concern over impact of MAT", *The Economic Times*, May 29, 2015.

We apply several well-established filters to clean the data. First, following the insider trading literature, we only focus on open market transactions and exclude option exercises and private transactions (Sias and Whidbee, 2010; Cohen, Malloy, and Pomorski, 2012). Second, SEBI requires every listed firm and director to disclose their interest or holdings as an initial disclosure. Since the disclosure is not an outcome of the open market transaction, we exclude them from our analysis. Third, we exclude observations that are reported more than 30 days after the actual transaction date. Finally, we also check our insider trading data for consistency with respect to the names of the insider.[13]

We collect FII's trade-level data from the SEBI endorsed National Securities Depository Limited (NSDL).[14] This database contains details of all individual trades conducted by FII since 1st January 2003. Internet Appendix A provides a snapshot of the dataset. Each transaction provides information related to the company name, international security identification number (ISIN), transaction date, transaction type (buy or sell), stock exchange-traded, traded rate, quantity traded, value, and instrument types. We collect data on firm characteristics from the Prowess database, maintained by the Centre for Monitoring Indian Economy (CMIE). The Prowess database is widely used by existing studies (Gopalan and Gormley, 2013; Vig, 2013; Gopalan, Mukherjee, and Singh, 2016). We use the Morgan Stanley Capital International (MSCI) India Index return as a proxy for the market return, which we source from the Thomson Reuters database. Finally, we collect analyst coverage data from I/B/E/S database.

[13] The database lacks consistency with respect to the names of insiders. As a result, for each firm, we ensure that the names of the inside traders are consistent throughout the sample. For example, the name of the insider could be entered as Mr. Harish Shetty or Harish Shetty or Harish Shety for a certain firm. We ensure that the name is consistent (such as Harish Shetty) for the firm throughout the insider universe. The exercise results in 14,003 unique insiders compared to 18,445 unique insider transactions before the correction.

[14] https://www.fpi.nsdl.co.in/web/StaticReports/FIITradeWise2008/FIITradeWise2008.htm

2.2 Main variable definition and construction

Our principal variables of interest are opportunistic and routine insider trading and FII's net equity trading. Following Cohen, Malloy, and Pomorski (2012), out of the *entire universe* of trades, we only include those insiders in our sample who make at least one trade in each of the three preceding years. We call this subsample a *partitionable universe* as we classify each of the trades either as routine or opportunistic trade. We define an insider as a *routine trader* who places a trade in the same calendar month for at least three consecutive years. All other insiders are characterized as *opportunistic traders*. Once an insider is identified as either routine or opportunistic at the beginning of each calendar year, all trades in the subsequent years are then classified as either opportunistic or routine trades.[15] Equations (1) and (2) show our measures of opportunistic (*OT*) and routine (*RT*) trades, where *OT* (*RT)* is the ratio of number of shares purchased minus number of shares sold by opportunistic (routine) insider *j(k)* on day *t* of the firm *i* scaled by the previous day's number of shares outstanding of firm *i* (Sias and Whidbee, 2010):

$$OT_{j,i,t} = \frac{Number\ of\ shares\ bought_{j,i,t} - Number\ of\ shares\ sold_{j,i,t}}{Number\ of\ shares\ outstanding_{i,t-1}} \quad (1)$$

$$RT_{k,i,t} = \frac{Number\ of\ shares\ bought_{k,i,t} - Number\ of\ shares\ sold_{k,i,t}}{Number\ of\ shares\ outstanding_{i,t-1}} \quad (2)$$

$Opportunistic\ Trading\ (OT_{j,i,t})$ is further classified into $Opportunistic\ Buy_{j,i,t}$ for a positive value and $Opportunistic\ Sell_{j,i,t}$ for a negative value. $Routine\ Trading_{k,i,t}\ (RT_{k,i,t})$ is similarly classified into $Routine\ Buy_{k,i,t}$ and $Routine\ Sell_{k,i,t}$. As a result of the classification, each insider's

[15] For example, if an insider is classified as a routine in the beginning of 2007 based on their past three years (2004-2006) trading, the insider is then treated as a routine for all his subsequent trades, regardless of their trading behavior in the post-classification period. Moreover, we check the past three years trading history of all opportunistic insiders each year. If the opportunistic insiders trade in the same calendar month in past three years, they become routine and then stay routine from that point onward.

trade is placed into one of four groups: (a) "Opportunistic buy", (b) "Opportunistic sell", (c) "Routine buy", or (d) "Routine sell".

We define FII's Net Equity Trading (NET_{it}) as the ratio of the number of shares purchased minus number of shares sold by FII in day *t* of the firm *i* scaled by the previous day's number of shares outstanding of firm *i*:

$$NET_{it} = \frac{Number\ of\ shares\ bought_{i,t} - Number\ of\ shares\ sold_{i,t}}{Number\ of\ shares\ outstanding_{i,t-1}} \quad (3)$$

In our sample period, the total number of firms that FII trade is 2,192. When we map these with the 885 firms in the *partitionable universe*, the result is a *final sample* of 722 common firms where FII, opportunistic, and routine insider trade (represents almost 82% of the firms in the partitionable universe) and 1,470 firms where only FII trade.

2.3 Summary statistics

Table 1 presents the summary statistics for the *partitionable* and *entire* insider trader-level universe samples. For comparative purposes, statistics related to insider trading and firm characteristics are provided for the entire universe as well as the partitionable universe (trades that are classified as either routine or opportunistic) of insider trades. Panel A indicates that our partitionable sample represents approximately 28% of the entire sample of insider transactions. Within the partitionable sample of 18,626 trades, the percentage of insider buy is 79% and insider sell is 21%. Further, within the buys of the partitionable universe, we classify 81.75% as opportunistic buy and 18.25% as routine buy. The comparable figures for insider sell are 75% and 25%. Overall, opportunistic insider trades are 80% and routine insider trades are 20% of our partitionable sample. Given that the buy and sell trade sizes of the partitionable sample are smaller than their entire universe counterparts, our classification of insider trades is not related to the overall trade size.

[Insert Table 1 about here]

Insiders are likely to delay reporting their trades, more so in emerging markets, if they are based on private information (Cheng, Nagar, and Rajan, 2007). In Panel B (Table 1), we report statistics on the number of days between the transaction and the reporting date (reporting delay).[16] The average reporting delay in the insider universe (our sample) is about 8 (5) days. Moreover, about 83% (73%) of the trades for the insider universe (partitionable universe) are reported within seven days of the transaction date. Around 54.17% of the trades are reported between two days and seven days which shows that the reporting delays are highly concentrated around the latest day. Interestingly, we find that reporting delays are more common with sell trades in the Indian context. Almost 75% of the insider trades that are reported after seven days of the transaction are either opportunistic or routine sell trades (not reported in the Table). Similarly, only 25% of insider trades that are reported beyond the 15 days after the transaction date are opportunistic buy trades.

Panel C (Table 1) provides summary statistics related to firm-level characteristics. The number of unique companies in our final sample represents around 35% of all firms with insider trades, which is similar in magnitude to that reported by Cohen, Malloy, and Pomorski (2012) in their U.S. sample. Although our partitionable sample firms have larger assets, higher market capitalization, and higher stock returns, other firm characteristics are generally representative of the overall sample.

3 Information content of opportunistic and routine trades

A central assumption of this study is that opportunistic insider trades possess valuable information on the underlying securities when they trade. In this section, we provide evidence on the information content of insider trades in India by analyzing their stock market performance following opportunistic and routine insider trades. We perform a multivariate regression analysis with future

[16] The [Prohibition of] Insider Trading Regulation 1992, Section (13) requires shareholders, who hold more than 5% shares or voting rights, and insiders to disclose the sales and acquisition of shares to the company within two working days (it was four working days prior to 19/11/2008). Following the receipt of the disclosure, the company is required to intimate the same to the exchanges within two working days (it was five working days prior to 19/11/2008). Thereafter the stock exchanges publish the information instantly.

one-month stock return as the dependent variable and indicators of routine and opportunistic trades as the independent variables. We run pooled regression with standard errors clustered at the firm level by including time (month) fixed effects.[17]

Our main variables of interest are D(Opportunistic Buy), D(Opportunistic Sell), D(Routine Buy) and D(Routine Sell). D(Opportunistic Buy) is a binary variable that takes the value of 1 for firms with opportunistic buys in the prior month and 0 otherwise. Similarly, D(Routine Buy) is a binary variable that takes the value of 1 for firms with routine buys in the prior month and 0 otherwise. D(Opportunistic Sell) and D(Routine Sell) are similarly defined. We follow prior literature and include firm size, book-to-market equity ratio, past month returns, and past year returns as control variables (Cohen, Malloy, and Pomorski, 2012). *Ln (Firm size)* is measured as a log of month-end market capitalization. *Ln (Book-market)* is (log of) the ratio of the book price to the market price of equity at the end of the month. *Past month return* is the return over the prior month and *Past year return* is the return over the prior year (excluding the prior month, (*t*-2, *t*-12)). The estimation results are presented in Table 2.

[Insert Table 2 about here]

We include D(Opportunistic Buy) and D(Routine Buy) in Model (1), D(Opportunistic Sell) and D(Routine Sell) in Model (2), and all the categories in Model (3). Table 2 shows that while opportunistic buy trades are significantly positively related to future stock returns, routine buys do not exhibit any relation with future returns. Model (1) shows that opportunistic buy trades yield a statistically significant return of 195 basis points in the following month (at the 1% level). Model (2) shows that neither opportunistic nor routine sell trades predict subsequent stock returns.[18] The

[17] We also rerun the empirical analysis using (i) pooled regression with firm and time (month) fixed effects (ii) using Fama-Macbeth (1973) regression and (iii) excluding months with extreme negative stock return (<-10%). The results are qualitatively similar and presented in Internet Appendix B.

[18] It may be possible that some of these opportunistic trades could be fire sales, portfolio adjustment, or part of a diversification strategy of the traders and therefore without any real information content. However, it is highly unlikely that all of them could be unrelated to any potential company specific signals, as supported by our event study (in Internet Appendix D). It shows that opportunistic buy and sell trades are informative and can be interpreted as a signal for positive and negative news, respectively. Also in the multivariate context, our results are consistent with the findings of existing literature (Ali and Hirshleifer, 2015; Hong and Li, 2019).

size of the coefficients in Model (3) indicate that, relative to all other insider trades, opportunistic buy trades yield an incremental 160 basis points in the following month. Comparatively, Cohen, Malloy, and Pomorski (2012) and Ali and Hirshleifer (2017) report incremental yields for opportunistic buys of 57 and 51 basis points, respectively for the U.S. market. Thus, information content, which is materially value-relevant, of opportunistic buys is significantly stronger in the context of the Indian market.

Overall, the combined differences in the coefficients between opportunistic and routine trades translate into an incremental return of 243 basis points per month [= (160 - 47) - (-99 - 30)] (compared to only 158 basis points per month as reported by Cohen, Malloy, and Pomorski (2012)). Although Cohen, Malloy, and Pomorski (2012) show the predictive power of opportunistic sell trades, our insignificant results for these trades are consistent with Ali and Hirshleifer (2017) who also do not find any evidence of opportunistic sells predicting subsequent returns.[19] While the direction and statistical significance of most of the control variables are as expected, we nevertheless find a positive relation between past and future stock returns, confirming the presence of momentum effect in emerging market returns (Rouwenhorst, 1999).

Models (4)-(6) of Table 2 shows the results for large insider trades, following the approach in the previous literature. For each category of insider trades, we sort all the trades into terciles and designate the top 33rd percentile as the largest insider trades. Model (6) indicates that, relative to all other insider trades, opportunistic buy trades yield an incremental 233 basis points in the following month. Consistent with past evidence (Fidrmuc, Goergen, and Renneboog, 2006), we find that the predictive ability of large insider trades is more pronounced.

We also analyze the information content of insider trades using Ali and Hirshleifer (2017) measure of opportunistic insiders. A brief discussion of the identification strategy and the results are

[19] The literature on insider trading generally concurs that stocks purchased by insiders earn positive abnormal returns, while stocks sold by insiders either do not exhibit the same level of negative abnormal returns or have zero abnormal returns (Lakonishok and Lee, 2001; Friederich et al., 2002; Jeng, Metrick, and Zeckhauser, 2003; Fidrmuc, Goergen, and Renneboog, 2006).

reported in Internet Appendix C. The findings are similar to our main result reported in Table 2. In Internet Appendix D, we also present results using cumulative abnormal returns (CARs) as the measure of stock market returns. Not surprisingly, we find that CARs associated with opportunistic buys are higher than those with routine buys; similarly, CARs for opportunistic sells are generally lower than those for routine sells.

4 Mimicking hypothesis

Given the findings on the informational content of opportunistic insider trades above, we now examine the connection between insider trading and subsequent FII trading.

4.1 Univariate results

Panel A of Table 3 provides univariate statistics on FII trading in all firms, and the entire and partitionable insider universes during our sample period. As seen, the average NET_{it} (Panel A.1), the number of shares traded (Panel A.2), and the value of shares traded by FII (Panel A.3) are larger for the partitionable universe compared to both the insider universe and all firms traded by FII. Panel B shows the average daily NET_{it} over a period of 30 days before and after insider trades. We find a significant increase (decrease) in FII trading following opportunistic buy (sell). Although FII also increase their trading intensity following routine buys, the magnitude is significantly smaller relative to opportunistic buys (i.e. 0.9315 vs. 1.7103 basis points). We find no difference in NET_{it} before and after routine sell trades. We graphically present the NET_{it} for 30 days before and after the insider trades in Figure 1. A simple eyeballing shows that, compared to all the other three, the opportunistic buy and sell figure shows a much sharper change in the magnitude of NET_{it} after the reported day of insider transaction. Such evidence lends suggestive support in favor of the mimicking hypothesis.

[Insert Table 3 about here]

[Insert Figure 1 about here]

Panel C of Table 3 shows the average time (in days) taken by FII to trade in the same direction as opportunistic and routine insiders (after the reported day). While FII take on average five days to mimic opportunistic buys, they take almost twice that time to mimic other trades. This suggests that FII are much quicker to react to opportunistic buys compared to all other trades. If we compare this with the information content of insider trades, as reported in Table 2, we observe that FII quickly follow the opportunistic buys due to the higher information content of such trades. In an unreported analysis, we also find that FII trade virtually immediately (within two days of the reported day) in one-third (50%) of all opportunistic buy trades. Taken together, these univariate results provide a strong initial indication in support of our mimicking hypothesis.

4.2 Multivariate results

In this section, we examine FII's NET_{it} for different event windows up to 30 days following the disclosure of insider trades using a regression approach. In all the regressions the dependent variable is NET_{it} and the key independent variables are opportunistic and routine trades (buy and sell). Drawing on the existing literature, we also control for various competing factors that could potentially be associated with FII's trading. Empirical evidence suggests that there is a positive link between net foreign flows and lagged stock returns. For example, Brennan and Cao (1997) suggest that the purchase of foreign assets is high when the return on such assets is high. We control for this return chasing effect at the firm level by including the previous day's stock return (*Stock return*).

Kang and Stulz (1997) and Dahlquist and Robertsson (2001) argue that foreign investors prefer to invest in larger growth stocks with higher liquidity. Accordingly, we control for size of the firm measured as log of market capitalization (*Ln(Firm size)*), growth using book-to-market ratio, measured as log of the ratio of book value to the market price of equity (*Ln(Book-market ratio)*), and liquidity using *Turnover* measure, constructed as the ratio of the number of shares traded to total shares outstanding. Further, studies indicate that risk, such as the volatility of returns, may also influence foreign investors (Bae, Chan, and Ng, 2004; Li et al., 2011). As a proxy of risk, we include

Stock volatility, calculated as the daily standard deviation of past 90-day stock returns. Aggarwal, Klapper, and Wysocki (2005) show that analyst coverage is a strong determinant of FII investments. Hence, we control for analyst coverage using the log of number of analysts following the firm *(Ln (1+Number of analysts).*[20] Furthermore, since earnings announcement affect FII investments (Ke and Ramalingegowda, 2005; Landsman, Maydew, and Thornock, 2012) and their return (Seasholes, 2000), we include a dummy variable *D (Announcement)* that takes a value of one if the insider trading day is within 30 days following the earnings announcement and zero else.

We use firm fixed effects and time fixed effects to account for firm-level heterogeneity and the time variation, respectively. Table 4 presents the regression results for three different event windows. Models (1), (2) and (3) examine FII's NET_{it} for 15, 20 and 30 days, respectively following the reporting of insider trades. The standard errors of the test statistics are double clustered at the firm and the time level.

[Insert Table 4 about here]

Consistent with the conjecture of our mimicking hypothesis, the positive and statistically significant coefficients reported in Models (1) – (3) show that FII strongly mimic opportunistic buy trades. However, FII's reaction to all other types of insider trades is insignificant - statistically and economically. The predictive power of past opportunistic buy trades on future NET_{it} persists up to 30 days following the reporting of the trades.[21] Given that the standard deviation of opportunistic buy is 29.41 basis points for our sample, a one-standard-deviation increase in opportunistic buy leads to a 0.1176 basis points increase in NET_{it} (over the 30-day period). This value is economically

[20] Following Chan and Hameed (2006), we include all the firms that do not have earnings forecasts by replacing missing number of analysts to zero. The result remain robust to exclusion of such firms.

[21] As can be seen from univariate results, FII execute their first trades within 5-10 days after the insider trades. Thus, in untabulated results, we also examine NET_{it} for event windows of less than 15 following the disclosure of insider trades. We do not find very strong statistically significant results for the less than 15 days event window, largely due to the loss of statistical power owing to the loss of a significant number of observations. For the event window of more than 30 days, we find a significant decline in the magnitude of mimicking by FII. This is consistent with the view that the share prices may adjust over time to the announcement of insider trades as stock markets are informationally efficient at least to some extent (Friederich et al., 2002; Fidrmuc, Goergen and Renneboog, 2006), which discourages FII from mimicking trades in a long-horizon.

significant, considering the average NET_{it} for the sample is 0.1416 basis points. Further, the mean (median) shares outstanding and the value-weighted average price per share are 470 (71) million and INR 808.81 respectively. Thus, 0.1206 basis points of NET_{it} translates to a mean (median) daily net trading of 5.53 (0.84) thousand shares, or daily market capitalization of INR 4.47 (0.68) million. Also, the effect is economically material as the median increase in NET_{it} following opportunistic buys is three times the median value of daily trades conducted by FII across our sample period.

In Models (4) – (6) of Table 4, we examine only larger insider trades. For each category of insider trades, we sort all the trades into terciles and designate the top 33rd percentile as the largest insider trades. Larger trades are more likely to be driven by opportunities to exploit private information (Fidrmuc, Goergen, and Renneboog 2006). Hence, we expect mimicking to be more pronounced in larger trades. Consistent with our expectation, we find that the size of the coefficients for opportunistic buys in Models (4) – (6) is significantly larger than those in Models (1) – (3). Economically, a one-standard-deviation (60.33 basis points) increase in large opportunistic buy leads to a 0.3439 basis points increase in NET_{it} (over a 30-day period), which translates into a mean (median) daily net trading of 16.16 (2.4) thousand shares or daily market capitalization of INR 13.07 (1.94) million.

Collectively, the findings from these tests highlight a positive and economically meaningful association between FII's NET_{it} and opportunistic buys, supporting the mimicking hypothesis. It suggests that FII value the information content of opportunistic buy trades and consequently trade in the same direction. Not surprisingly, FII do not seem to accord the same informational content for opportunistic sell as well as routine trades.

For the control variables, we find evidence of return-chasing behavior/momentum trading at the firm level, suggesting that FII use recent stock to extract information about future returns. The strong and consistent significance of the momentum factor demonstrates the effect of herding in the Indian emerging market. Further, consistent with Dahlquist and Robertsson (2011), we find that FII

are more likely to invest in growth-oriented stocks (low book-to-market ratio) and firms with high turnover.

4.3 Additional tests

4.3.1 Addressing endogeneity

One concern with our mimicking evidence is the possibility of reverse causality between FII and insider trading. Empirical evidence suggests that insiders prefer value stocks and stocks that have recently declined in value (Jenter, 2005; Piotroski and Roulstone, 2005; Sias and Whidbee, 2010). On the other hand, FII prefer growth stocks and those with a recent positive return, while avoiding firms that pay high dividends (Gompers and Metrick, 2001; Ferreira and Matos, 2008). These diverse preferences could drive an inverse relation between the insider and FII's trading.[22]

We conduct two tests to address the possibility of reverse causality. First, we regress the lag of NET_{it} (i.e. FII's trading before the disclosure of insider trades) on opportunistic and routine trades. The results are presented in Table 5, where time and firm fixed effects are included, and standard errors are clustered at the time and the firm level. In Models (1), (2) and (3) we regress the 15-day, 20-day, and 30-day lag FII NET_{it} respectively for the four types of insider trading. As evident from the results, we fail to find any evidence suggesting the possibility that insiders react to past FII's trading.

[Insert Table 5 about here]

Second, we perform a propensity score-matched difference-in-difference (PSM-DiD) analysis. Our PSM-DiD approach is a quasi-natural experiment where we compare two groups of FII, which should be similar in every aspect except one group is engaged in firms with opportunistic insider trading related information (treatment), and the other group is not (control). We argue that in the absence of mimicking by FII there should not be any significant difference in FII trading between the two firm categories, all else being constant.

[22] It could be that insiders may be trading on information generated by FII's trading.

We employ the PSM technique to generate such near-randomized identical treatment and control groups.[23] Of the 2,192 firms with FII trading, there are 722 firms where FII, and opportunistic and routine insiders trade, and 1,470 firms where only FII trade. We use the following two steps to identify matches between these two groups of firms. In the first step, we estimate a probit model where the dependent variable is equal to 1 if the firm belongs to the treatment group (i.e. firm in which both FII and opportunistic and routine insiders trade) and 0 otherwise. We use various firm-level characteristics as matching covariates. Kang and Stulz (1997), Dahlquist and Robertsson (2001), Aggarwal, Klapper, and Wysocki (2005), and Ferreira and Matos (2008) suggest that foreign investors prefer firms that are larger, have lower leverage, hold larger cash balances, have a higher return on equity, and possess better current ratios. Correspondingly, we include a log of market capitalization (*Ln(Firm size)), Leverage, Return on equity, Cash holdings* scaled by total assets, and *Current ratio* in our analysis. Miletkov, Poulsen, and Wintoki (2014) find that FII show a preference for investing in firms with more independent boards and younger firms. Therefore, we also include (log of) *Board size*, the *Board independence,* and the (log of) *Firm age* as matching covariates.

Model (1) of Table 6 (Panel A) presents the probit model estimates with industry fixed effects and standard errors clustered at the industry level. The specification shows some of the independent variables (such as firm size, return on equity, firm age, board size, and board independence) are statistically significant between the two groups. In the second step, we use the propensity scores from Model (1) to perform nearest-neighbor PSM within a 0.01 caliper. Our PSM output sample consists of 462 unique pairs of matched firms.

[Insert Table 6 about here]

[23] This ensures that our two groups are identical in every aspect and any time-constant or time-varying factors would not have a differential effect. Such an approach significantly reduces the possibility of the results being driven by any other alternative explanations except insider trading (Rosenbaum and Rubin, 1983; Smith and Todd, 2005; Rubin and Waterman, 2006; Rubin, 2007; Angrist and Pischke, 2008). Thus, even if we are unable to obtain any potential key variable that should be part of the model's estimation, particularly the unobserved time-varying ones, our estimates are robust to omitted variable and alternative explanation biases. This is because any potential factor should have homogeneous effects on the control and treatment groups (Angrist and Pischke, 2008, chapter 3, p.62).

We conduct additional diagnostic tests to verify our matching process. First, we rerun the probit model using the matched sample of firms. The results in Model (2) of Panel A show that none of the independent variables is statistically significant. This suggests that there are no observable differences in firm characteristics between the treatment and control groups. Second, we examine the difference in propensity scores between the treated and the matched control group. Panel B of Table 6 shows that the difference in the propensity scores across the two groups is negligible. Finally, in Panel C of Table 6, we report the univariate statistics of the firm characteristics for the two groups with their corresponding *t*-statistics. As shown, none of the mean differences between the treatment and control group firms is significant.

In Table 7, we examine the difference in the NET_{it} between the treatment and control group firms. Following our main evidence on mimicking, our focus here is only on opportunistic trades. For each matched control firm, the event date is taken to be the same as that of the matched treatment firm. Thus, in our case of the two groups of matched firms, there should not be any significant differences in FII trading, unless the FII are motivated to trade more in the treatment group due to the presence of opportunistic insider trades. In Panel A, we present the mean difference in NET_{it} for opportunistic buy and sell trades. Columns numbered (1) and (2) report the average NET_{it} before and after the reported date of opportunistic buy and sell trades for the treatment group, respectively. Column (3) reports the difference. Columns (4) – (6) report similar statistics for the control group. In Column (7), we report the DiD estimator, which is the difference in NET_{it} between the control and the treatment group before and after the reported date of opportunistic buy and sell trades (corresponding *t*-statistics are presented in parentheses).

[Insert Table 7 about here]

Panel A of Table 7 presents two important findings. First, the NET_{it} for the treatment group increases (decreases) following the reporting of opportunistic buy (sell) trades, which is consistent with the mimicking hypothesis. Second, and more importantly, the increase in the NET_{it} following

opportunistic buy trades is significantly larger in the treatment group compared to the control group. The DiD estimator is positive and statistically significant for different event windows, at least at the 5% significance level. The decrease in the NET_{it} following opportunistic sell trades is statistically significant for only one event window. These results are consistent with our main findings that FII generally trade in the same direction when opportunistic insiders buy their stocks.

In Panel B of Table 7, we also show the dynamics of the DiD estimator in a regression framework. We retain the FII's trading level data for both treatment and control firms centered on the reporting date for three periods: 15 days, 20 days and 30 days. Our main dependent variable is NET_{it}. Our main independent variable is either *Opp buy event*$_t$ × *TRMT*$_i$ or *Opp sell event*$_t$ × *TRMT*$_i$. *Opp buy event*$_t$ is a dummy variable that takes the value of 1 for the days following opportunistic buy trades and 0 otherwise. Similarly, *Opp sell event*$_t$ is a dummy variable that takes the value of 1 for the days following opportunistic sell trades and 0 otherwise. *TRMT*$_i$ is a dummy variable that takes the value of 1 for the firms in the treatment group and 0 for the firms in the control group.

We report the regression results for opportunistic buy trades in Models (1) – (3) and for opportunistic sell trades in Models (4) – (6). We use the same set of control variables as used in Table 4 and defined in the notes to Table 1. We control for time and firm fixed effects and cluster standard errors at the time and firm-level. In Models numbered (1) – (3), we observe a statistically significant relation between opportunistic buys and FII trading. On the other hand, in Models (4) – (6) we observe insignificant negative coefficients for our main independent variable. Overall, our results suggest that FII react immediately to opportunistic buys by trading in the same direction, confirming our mimicking hypothesis.

4.3.2 Information environment and FII's mimicking

Our mimicking hypothesis suggests that FII who are at information disadvantage would mimic insider trades. If this is indeed the case, then FII's mimicking should be more pronounced in firms where relatively the information environment is more opaque, and the corporate governance is

weaker. In this subsection, we test these cross-sectional conjectures of mimicking hypothesis in the subsample of firms with varying levels of the information environment and quality of corporate governance. In line with extant literature, we measure the firm-level opacity degree of information environment using standard proxies such as stock price synchronicity, idiosyncratic volatility, stock illiquidity, and promoters' ownership (Morck, Yeung, and Yu, 2000; Campbell et al., 2001; Jin and Myers, 2006; Bartram, Brown and Stulz, 2012). Similarly, we measure the degree of corporate governance using the evidence on whether the firm is internationally cross-listed, as cross-listed firms are considered to have better corporate governance practices and a higher information environment (Hermann, Kang, and Yoo, 2014).[24]

Stock price synchronicity is constructed based on the R^2 of the CAPM model estimated using daily stock return data. Following Morck, Yeung, and Yu (2000), the stock price synchronicity is defined as $\log[R^2/(1-R^2)]$. Firms with greater price synchronicity tend to have lower firm-specific information, which leads to an impaired information environment (Morck, Yeung, and Yu, 2000; Dasgupta, Gan, and Ning, 2010). Likewise, a firm with higher idiosyncratic volatility is associated with higher firm-specific information (Ang et al., 2006; Jiang, Xu, and Yao, 2009; Lee and Mauck, 2016). Gider and Westheide (2016) show that insiders buy shares when information asymmetry is high. Hence, we also expect FII, as they mimic insiders, to trade more in firms that exhibit less firm-specific information. The idiosyncratic volatility is estimated by the variance of the residuals of the CAPM model using daily stock returns.

Next, we calculate stock illiquidity as the percentage of days with zero stock returns. Higher illiquidity is associated with a lower information environment (Chordia, Roll, and Subrahmanyan, 2008). We also consider promoters' (insider) ownership, as larger inside ownership is associated

[24] A well-established body of literature, known as the bonding hypothesis, offers convincing theoretical arguments and empirical evidence that internationally cross-listed firms, particularly from emerging markets, possess better corporate governance practices relative to their non-cross-listed domestic counterparts, as the former must comply with stringent corporate governance regulations of the developed market (Stulz, 1999; Coffee, 2002; Karolyi, 2012). We obtain the list of cross-listed firms from https://www.adrbnymellon.com/directory/dr-directory (maintained by The Bank of New York Mellon). We identify 190 Indian firms that are currently listed as well as terminated in the past. After matching, we identify 89 cross-listed firms where FII and opportunistic and routine insiders trade.

with an opaque information environment (Baik, Kang, and Morton, 2010). We rerun our analysis in Table 4 for the subsample of firms based on high and low information environments (using median value as the cut-off) and whether or not firms are cross-listed. Table 8 reports the regression results.

[Insert Table 8 about here]

As expected, we find a more pronounced effect of opportunistic buys in firms that have a more opaque information environment and a more attenuated effect in firms that are cross-listed. We find that the relation between FII trading and opportunistic trades is significant only in firms with high price synchronicity and high promoter ownership. Although the effect of opportunistic trades appears to be statistically significant in firms with both high and low idiosyncratic volatility and stock liquidity, the economic significance of the effect is much higher in firms with an opaque information environment. Overall, the results are consistent with our argument that FII mimic opportunistic insider trades to help them mitigate their information asymmetry friction to a considerable extent.

4.3.3 Reporting delay in insider trades and FII's mimicking

Several empirical studies analyze the reporting delays in insider trades and conclude that prices may be distorted during the transaction and reporting dates (Carter, Mansi, and Reeb, 2003; Betzer and Theissen, 2010). Betzer et al. (2015) argue that reporting delays can impede the price adjustment to the information in the insider trades. Similarly, Cheng, Nagar, and Rajan (2007) find evidence that insiders are more likely to trade on private information when disclosure of the trade is delayed. The examination of reporting delay is particularly important in the context of emerging markets where insiders may exploit the lax insider trading regulation and strategically delay reporting their trades. Cheng and Lo (2006) find evidence of timing the voluntary disclosure by insiders to maximize their return. Biggerstaff, Cicero, and Wintoki (2020) also show that the opportunistic insiders seek to extend their informational advantage by delaying the reporting dates as long as possible. As such, we examine the FII's mimicking reaction based on the delay of reporting of the insider trades. We rerun our main regression (for 30 days) on a subsample of insider trades based on the reporting

delays. Table 9 presents the results of this analysis. Models (1) – (3) examine the reporting delay of less than one day, three days, and seven days respectively. Models (4) and (6) examine the reporting delay of more than seven days and 15 days respectively, while Model (5) examines the reporting delay greater than seven days but less than 15 days.

[Insert Table 9 about here]

The results suggest that FII mimic the opportunistic buy trades that are disclosed within seven days. However, the insider trades that are disclosed beyond seven days do not incite FII's reaction. As the average reporting delay for opportunistic buy trades is around five days and 81% of the opportunistic trades are reported within seven trading days, FII's reaction to the reported opportunistic buy is higher.

4.3.4 Who mimics insider trades?

Schmidt (2019) finds that institutional investors remain more attentive to stocks that are already in their "portfolio watchlist". We test this conjecture in our setting. We calculate the daily portfolio holding of each FII in each sample firm at the beginning of 2003.[25] Thus, on a trading day, if the portfolio holding of an FII in a firm is positive, it would suggest that the FII currently holds the firm in its portfolio. If it is missing, the FII has never invested in the firm, and if it is zero or negative, the FII has invested in the firm in the past but currently does not hold the firm in its portfolio. Based on the portfolio holding, we classify each FII as (a) past FII if the portfolio holding in a firm in the previous trading day is either zero or negative, (b) new FII if there is no portfolio holding in a firm in the previous trading day, or (c) existing FII if the portfolio holding in a firm in the previous trading day is positive. Finally, NET_{it} is classified into (a) NET_{it} by past FII, (b) NET_{it} by new FII, and (c) NET_{it} by existing FII. We rerun the analysis in Table 4 (for 30 days) and present the results in Table 10.

[25] The trading level data by NSDL masks the true identification of FII, but provides a unique identification code that allows us to track FII investments over time.

[Insert Table 10 about here]

In Models (1) – (3), the dependent variable is NET_{it} by past FII, new FII, and existing FII respectively. All other variables are similar to Table 4. The coefficients of opportunistic buy trade are statistically significant in Models (2) and (3), suggesting that new and existing FII mimic the opportunistic buy trades, but past FII do not. The evidence on existing FII complements Schmidt (2019) who finds that institutional investors remain more attentive to stocks that are already in their "portfolio watchlist". We provide an additional insight that FII could also pay attention to information of potential stocks to be included in their portfolio, hence new FII positively react to the opportunistic buy trades. However, we do not find evidence that FII who held the stock in the past react to the information content of opportunistic insider trades.

5 Abnormal return of the mimickers

In this section, we test our second hypothesis by examining whether the FII who mimic opportunistic insider trades have better trading performance. We use both calendar time portfolio tests and an event study approach. As we are interested in examining the returns earned by FII only, our analysis focuses on only those firms where both FII and insiders (opportunistic and routine) trade.

5.1 Calendar-time portfolio analysis

We first examine whether FII who mimic opportunistic insider trades earn a superior return using a calendar-time portfolio approach. To do so, we calculate returns based on the actual trades conducted by FII. Our approach is a departure from other studies that examine the informativeness of insider trades. For example, Cohen, Malloy, and Pomorski (2012) examine the predictive ability and the portfolio return of the opportunistic/routine insiders, and Collin-Dufresne and Fos (2015) investigate the abnormal buy-hold return of the Schedule 13D filers. As our dataset allows us to track the FII equity trading following the disclosure of the insider trades, we uniquely examine the portfolio return of the actual trades of the FII (rather than the insiders). In other words, we examine the returns of the mimickers of the insider trades.

Analogous to Kallunki et al. (2018), we calculate the following return measures for FII's trades. For each month in our sample period (January 2007 to December 2014, a maximum of 96 months), we calculate the raw return over a one-month period for each FII's trades conducted within 30 days after opportunistic and routine trades. We reverse the sign of the one-month raw return for any sell trades conducted by FII following the opportunistic or routine buy trades and for any buy trades conducted by FII following the opportunistic or routine sell trades.[26] We then calculate the monthly averages of these raw returns. For the adjusted return, we follow the same procedure using a one-month market-adjusted return instead of raw returns. This results in a time-series of equally-weighted monthly portfolio returns earned by FII after the opportunistic and routine trades. Next, we use an intercept test using the CAPM, the three-factor model of Fama and French (1993), and the four-factor Carhart (1997) model, where the dependent variable is the calendar-time returns of each portfolio, or the difference between returns of long opportunistic (routine) buy and short opportunistic (routine) sell portfolio, or the difference between returns of long opportunistic buy (sell) and long routine buy (sell) portfolio. We examine the following CAPM, three-factor, and four-factor regression for every four portfolios:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p\left(R_{mt} - R_{ft}\right) + \varepsilon_{pt}, \tag{4}$$

$$R_{pt} - R_{ft} = \alpha_p + \beta_p\left(R_{mt} - R_{ft}\right) + \gamma_p SMB_t + \varphi_p HML_t + \varepsilon_{pt}, \tag{5}$$

$$R_{pt} - R_{ft} = \alpha_p + \beta_p\left(R_{mt} - R_{ft}\right) + \gamma_p SMB_t + \varphi_p HML_t + \omega_p WML_t + \varepsilon_{pt}, \tag{6}$$

where R_{pt} is the portfolio return for month *t* for each portfolio, R_{ft} is the month *t* risk-free rate of return proxied using 90-day treasury bills rate, $R_{mt} - R_{ft}$ is the month *t* excess return. SMB_t is the difference between the month *t* returns on diversified portfolios of small stocks and big stocks, HML_t is month *t* difference between returns on a diversified portfolio of high book-to-market (value) stocks

[26] As the sell (buy) transactions by FII, after opportunistic/routine insider buy (sell) trades, are in contrary trading directions, we reverse the sign of the raw returns.

and low book-to-market (growth) stocks, and WML_t is the difference between month t returns on diversified portfolios of the winners and losers of the past year.[27]

[Insert Table 11 about here]

Table 11 reports the calendar-time raw returns and risk-adjusted returns for portfolios of trades conducted after the opportunistic (routine) insider trades. The results in Panel A show that average raw and average market-adjusted return of the portfolio based on opportunistic buy trades are significantly higher than those of the portfolio based on routine buy trades. The portfolio of opportunistic buy (routine buy) yields an average monthly market-adjusted return of 2.24% (1.43%) which translates into an economically meaningful annualized return of 30.45% (18.58%). These results hold after controlling for risk using the standard CAPM model, the Fama-French three-factor, and Carhart four-factor models. The estimated intercepts are significantly positive for opportunistic buy portfolio (2.20% using the CAPM, 2.13% using three-factors, and 2.26% using four-factors) and for Long OB minus Long RB portfolio (1.02% using the CAPM, 0.91% using three-factors, and 0.88% using four-factors).

In Panel B of Table 11, we find a significant negative monthly raw return for the opportunistic sell portfolio (at the 5% level); however, the return is not significantly different from the routine sell portfolio. The estimated intercepts based on all models are not significant for opportunistic sell or routine sell portfolios as well as Long OS - Long RS portfolio. In Panel C, we conduct the long/short portfolio for opportunistic (routine) buy and sell trades. We find that the long/short portfolio on opportunistic trades yields a significantly positive average market-adjusted return of 3.03% that translates into an annualized return of 43.08%, i.e. 29.18% points higher than the annualized return earned on the long-short portfolio on routine trades. Similarly, the estimated

[27] The construction of these portfolios in the Indian context is discussed in detail in Agarwalla, Jacob, and Varma (2013). We acknowledge Sobesh Agarwalla, Joshy Jacob, and Jayanth R. Varma for providing this data in their webpage: http://faculty.iima.ac.in/~iffm/Indian-Fama-French-Momentum/

intercepts are significantly positive for long OB + short OS portfolio (2.81% using the CAPM, 2.73% using three-factors, and 2.86% using four-factors).

Taken together, the results suggest that FII earn a significantly higher return from trades conducted after the opportunistic buy compared to routine buy, but the return from opportunistic sell is no different from the routine sell trades.[28]

5.2 Cumulative abnormal returns of the treatment and the control firms

In this section, we compare the CARs of the FII who trade in the treatment firms (identified in Section 4.3.1) with CARs of FII who trade on the PSM control firms. We conduct an event study and compare the CARs earned after reporting of opportunistic trades for the treatment and control groups, and examine the difference in the CARs. We calculate CARs using the market model, with the market return being proxied by the MSCI India Total Return Index. The estimation period for the market model is -200 to -21 days prior to the disclosure of the opportunistic and routine trades. We present the results in Table 12.

[Insert Table 12 about here]

As seen in the table, we report the CARs for opportunistic buy for both the control and the treatment group for a period centered around 41 days on the reported day. For the post-reporting periods, the CARs for opportunistic buy are positive and significant at 1% for both treatment and control groups. More importantly, the CARs for the treatment group are higher than the CARs for the control group and the difference in the CARs is statistically significant at 1%. Specifically, the difference in CARs ranges from 0.493% to 1.086% after the reporting of opportunistic buy. This further suggests that FII earn a superior abnormal return by taking a long position on the stock bought by the opportunistic insiders.

[28] The results also provide indirect evidence that the FII have ability to pick or mimic stocks that are likely to do well in the future. This implies that FII are trading on insider trades that are informationally superior, as higher returns should reflect expected higher cash-flows, profitability and growth opportunities of the firm.

Similarly, we also report the CARs for opportunistic sell for both the control and treatment groups. The CARs for opportunistic sell are negative for the treatment group and statistically significant at the 5% level, while the CARs are positive for the control group and statistically significant at 10% for the 1-5 days window period only. The difference in CARs between the treatment and control groups ranges from -0.575% to -0.563% for 1-5 and 1-10 days window periods and are statistically significant at the 5% level. However, the difference is not significant for the 1-20 days window period. This provides partial support to our hypothesis that FII earn a superior abnormal return by taking a short position on the stocks sold by opportunistic insiders.

6 Robustness tests

In this section, we undertake additional checks to ensure the robustness of the above results.

6.1 Change in insider trading regulation

Our final sample period ends in 2014 due to the change in insider trading regulations. The "Prohibition of Insider Trading Regulations 2015", which replaced the previous regulation established in 1992, implemented stricter controls on insiders, including widening the definition of insiders, increasing the scope of its applicability, placing restrictions on trading by insiders possessing price-sensitive information, and broadening the monitoring obligations of the firm. The regulation was announced on January 15, 2015, to be effective from May 15, 2015.

Existing literature shows that stricter insider trading regulations reduce the case of informed insider trades (Aitken, Cumming, and Zhang, 2015) and decrease the information asymmetry in the market as well (Frijns, Gilbert, and Tourani-Rad, 2008). Akbas, Jiang, and Koch (2020) also show that the trading performance of insiders is attenuated after the passage of the Sarbanes Oxley Act. The passage of the new insider trading regulation could also constrain information-motivated insider trading activities in India. Hence, we conjecture that the extent of the opportunistic trading and its informativeness should decline following the new regulation. Similarly, the extent of mimicking by FPIs should also decline following the stricter insider trading regulation.

We exploit this exogenous variation of 2015 regulation to conduct an out-of-sample test of the informativeness of the insider trading and mimicking hypothesis. The sample period ranges from January 2014 to December 2016. The results are presented in Table 13. Panel A provides a mean difference in each category of insider trades in the post-regulation period. As expected, we find a significant decline in the average trading of opportunistic buy and opportunistic sell. The decline in the average trading of routine buy and routine sell is insignificant.

[Insert Table 13 about here]

Panel B of Table 13 examines the informativeness of insider trading. We construct a dummy variable $D(Regulation_{2015})$ that denotes the passage of the regulation on May 15, 2015, and interact them with our main dependent variables.[29] Model (1) shows the predictive ability of insider trades after the enactment of stricter insider regulation. Consistent with our conjecture, the predictive ability of opportunistic buy trades (117 basis points) is lower than what we find in Table 2. In Model (2), again in line with expectation, the interaction term $D(Opportunistic\ buy) \times D(Regulation_{2015})$ is statistically negative denoting a reduction in the predictive ability of the opportunistic buy to predict stock returns in the post-regulation period compared to the pre-regulation period. Panel C of Table 13 examines the mimicking hypothesis. Again, Model (1) shows that the extent of mimicking is lower in the post-regulation period and the statistically negative coefficient of interaction term $Opportunistic\ buy \times D(Regulation_{2015})$ in Model (2) implies a reduction in the extent to which FPIs mimic the opportunistic buy trades.

6.2 Alternative definition of opportunistic and routine trades

In contrast to Cohen, Malloy, and Pomorski (2012), who focus on the trading history of each insider to identify the opportunistic and routine trades, Ali and Hirshleifer (2017) focus on the profitability of past insider trades prior to the QEA. As a robustness test, we use Ali and Hirshleifer (2017)

[29] Our results remain qualitatively similar using the announcement date of Jan 15, 2015 as an event date.

identification strategy to classify the insiders' opportunistic trades.[30] The results are presented in the Internet Appendix E. Using this alternative definition, we find results consistent with our main findings reported in Table 4 supporting the mimicking hypothesis.

We also use an alternative definition of opportunistic and routine trades to test the robustness of our main results. First, following Cohen, Malloy, and Pomorski (2012) we use the trade-level measure to define the opportunistic and routine trades, as opposed to the trader-level measure used so far. In this trade-level measure, we look at the previous three years' trading history of an insider, and categorize the insider's subsequent trade in the same month as routine trade and in a different month as opportunistic trade.[31] We test the mimicking hypothesis, analyse calendar-time portfolio of FII who mimic opportunistic and routine trades, and conduct event study for treatment and control groups in Panels A, B and C of Table 14 respectively. As evident from all the statistics, the findings using an alternative definition of opportunistic and routine trades are similar to our main results reported in the earlier sections.

[Insert Table 14 about here]

Further, we also use a stricter definition of routine and opportunistic trades. So far, in all our investigations, we track the insider trades for three preceding years for the classification. As an alternative test, we now track an insider trades for five preceding years and classify them as routine insiders if they placed a trade in the same calendar month for at least five consecutive years. Otherwise, the trader is considered as an opportunistic trader. However, and as expected, this classification reduces the number of classified trades from 18,626 to 10,264. We present the results in the Internet Appendix F, where we test the mimicking hypothesis along with the adjusted return of FII who mimic. Our findings are very similar and consistent with our main results. These results

[30] The identification strategy is discussed in the Internet Appendix C.
[31] For example, an insider may be classified as a routine insider if they have three straight March trades. In this trader-level measurement, we only classify their subsequent March trades as routine trades and their trades in other months as opportunistic trades.

demonstrate that our identification of opportunistic versus routine trades is robust to reasonable changes in the classification procedure.

6.3 Alternative definition of FII's trading

To further verify the robustness of our results, we follow Cohen, Malloy, and Pomorski (2012) and use changes in FII's ownership of a firm (as % of total stock) as an alternative measure of FII's trading activity. We measure the change in FII's ownership at a quarterly frequency and regress it on the (log of the) number of opportunistic and routine trades in that stock. To analyze the mimicking hypothesis, we explore the lagged response by regressing lagged value of the number of opportunistic and routine trades over two quarters on the changes in the FII's holdings for the current quarter.

We also control for several factors that might have confounding effects on the change in FII's holdings. All these variables are lagged by one quarter. In addition to the time-varying control variables, we also control for time and firm fixed effects and cluster the errors at the firm and time level. The results, using the alternative definition of FII's trading, are presented in Table 15.

[Insert Table 15 about here]

Similar to the results reported by Cohen, Malloy, and Pomorski (2012), Models (1) – (3) of Table 15 show that the predictive power of opportunistic buys for future holdings of FII is statistically significant at the 1% level. The result also demonstrates the predictive power of opportunistic sell in explaining the future holdings of FII. Collectively, these tests provide support to our earlier evidence that FII seem to mimic the trades of past opportunistic insiders.[32]

6.4 Portfolio pumping, window dressing, and investor overreaction

We also examine the possibility that portfolio pumping or window dressing could explain our results. Evidence suggests that institutional investors engage in trades to manipulate the prices of securities

[32] The results are qualitatively similar when using the alternative definition of opportunistic and routine insiders trading discussed in Section 6.2.

via excessive buying of the securities (usually at the quarter-end or year-end) that they already own, known as portfolio pumping (Carhart et al., 2002; Ben-David et al., 2013). Similarly, institutional investors also tend to buy (sell) securities that have performed well (poorly) towards the end of the quarter or year, to make investors believe those were their holdings throughout the quarter or year, known as window dressing (Meier and Schaumberg, 2006; Morey and O'Neal, 2006). Using daily institutional investors' trading data, Hu et al. (2014) find evidence of year-end price inflation due to institutional selling, rather than buying, but do not find evidence of window dressing by institutional investors. Likewise, Lalwani, Sharma, and Chakraborty (2019) show investor over-reaction to the negative news such as extreme negative return. To address these concern, we re-conduct our main analysis in Table 4 excluding all month-end trading (the last 5 days of one calendar month and the first 5 days of the following month) by FII (in Models 1-2) and excluding months with extreme negative returns (Model 3). The results are presented in Internet Appendix F. In this alternative setting, the results are consistent with and robust to our main results, mitigating the concerns of portfolio, window dressing, and investor overreaction.

7 Conclusion

Prior studies show that while some insider trades are informative, others are relatively less useful. Insider trades that are routine in nature and for liquidity needs do not appear to predict future stock returns. On the other hand, opportunistic insider trades (trades that are not routine in nature) are shown to be highly informative that triggers a substantial market reaction. This evidence is largely clustered in developed markets. Given that emerging markets suffer from lower enforcement of insider trading regulations and lower probability of prosecution, we argue that insider trades in such a setting should be more informative. Using a unique trade-level dataset, we analyze the informativeness of opportunistic trades in the context of the Indian market by examining the trading behavior of FII following the disclosure of insider trades. Given the informational disadvantage in

emerging markets, our study hypothesizes that FII have an incentive to pay attention to insiders and mimic their trades. We also examine whether FII earn higher profitability by mimicking insider trades.

We find robust evidence that opportunistic insider trades, particularly buy trades, have higher information content in emerging markets compared to the developed markets. We show that the combined differences between opportunistic trades and routine trades translate into an incremental 243 basis points per month of predictive ability of opportunistic trades relative to routine trades. This incremental predictive information content in the Indian emerging market is much higher than that reported for the U.S. (approximately 158 basis points).

Most importantly, we find robust and consistent evidence of FII mimicking the opportunistic buy trades but not the sell trades. We show that FII mimic the opportunistic buy trades within 15 days of the disclosure of such trades and continue to do so, even up to 30 days. Economically, we find that a one-standard-deviation increase in opportunistic buy trades results in a 0.1176 basis points increase in FII's net equity trading. This translates into daily FII's net equity trading of INR 4.47 million per share. This relation seems to be much stronger for larger opportunistic buy trades and in firms that are relatively more opaque and weaker in corporate governance quality. Our findings also suggest that FII view opportunistic sell and, routine buy and sell insider trades as uninformative. Further, using a calendar time portfolio analysis as well as an event study approach, we find that FII who mimic opportunistic buy trades earn significantly higher returns compared to FII who mimic routine buy trades.

Collectively, our results suggest that compared to the U.S., the information content of insider trading is significantly higher in India. Such predictive information content could be exploited by outside investors, such as FII who are informationally disadvantaged, to mitigate the challenges of information asymmetry present in such markets. To end, we point to some valuable directions for future research. Since our study only examines FII, it would be interesting to explore other investors'

(such as retail or domestic institutional) reaction to insider trades. Also, conducting a detailed examination of the type of insiders who trade, and examine firm performance following insider traders, particularly the opportunistic ones, to identify whether or not these trades are indeed based on superior information would be interesting avenues for future research.

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Table 1: Summary statistics

Panel A: Insider-level characteristics

	Partitionable universe		Entire universe	
	Mean	Median	Mean	Median
# of insider trades	18,626		67,261	
# of insider buys	14,824		46,230	
% of insider buys that are opportunistic	81.75%			
% of insider buys that are routine	18.25%			
# of insider sells	3,802		21,031	
% of insider sells that are opportunistic	75.04%			
% of insider sells that are routine	24.96%			
% of all trades that are opportunistic	79.59%			
% of all trades that are routine	20.41%			
Buy trade size (bps)	11.47	3.71	23.44	4.30
Opportunistic buy trade size (bps)	12.10	3.95		
Routine buy trade size (bps)	8.51	2.66		
Sell trade size (bps)	-18.97	-0.24	-49.26	-3.61
Opportunistic sell trade size (bps)	-25.10	-5.47		
Routine sell trade size (bps)	-6.63	-0.55		
Panel B: # of Days between transaction and reporting days				
All insider trades	4.60	3.00	7.91	4.00
% same day	6.77		4.66	
% within 1 day	28.68		23.44	
% within 7 days	82.85		73.73	
% within 15 days	96.11		90.74	
All insider buys	4.63	3.00	7.82	4.00
All insider sells	4.42	3.00	8.08	4.00
Opportunistic buys	4.71	3.00		
Opportunistic sells	4.48	3.00		
Routine buys	4.38	3.00		
Routine sells	4.48	3.00		

Panel C: Firm-level characteristics	**Frequency**				
# of unique companies		885		2,542	
Stock return (%)	Daily	0.08	0.00	0.02	-0.06
Stock volatility	Daily	3.29	3.21	3.50	3.48
Firm size (INR Million)	Daily	36,809.11	1853.48	23,533.10	869.19
Book-market (Times)	Daily	3.50	0.79	3.34	0.84
Turnover (%)	Daily	0.28%	0.80%	0.50%	0.11%
D (Announcement)	Daily	0.51	1.00	0.41	1.00
Number of analysts	Monthly	2.26	0.00	1.26	0.00
Total assets (INR Million)	Quarterly	272,456.50	9,323.50	60,105.58	4,751.70
Leverage (%)	Quarterly	99.39%	48.30%	173.92%	56.74%
Return on equity (%), annualized	Quarterly	7.46%	5.83%	8.57%	5.91%
Cash holdings (%)	Quarterly	5.66%	2.53%	6.42%	2.78%
Current ratio (Times)	Quarterly	4.35	1.37	5.76	1.28
Firm age (Years)	Quarterly	30.63	25	28.79	23
Board size (#)	Quarterly	10.31	10	9.79	9

Board independence (%)	Quarterly	48.49%	50.00%	47.76%	46.67%
Price synchronicity	Annual	-1.89	-1.68	-3.01	-2.51
Idiosyncratic volatility (%)	Annual	8.63	7.23	12.86	11.68
Stock illiquidity (%)	Annual	1.76	1.19	3.98	2.23
Average FII's ownership (%)	Quarterly	10.19	6.69	8.15	4.5
Average DII's ownership (%)	Quarterly	6.19	3.72	5.13	2.04
Average promoters' ownership (%)	Quarterly	50.36	51.58	50.77	52.57

This table presents an overview of the sample for partitionable universe compared to the entire insider universe over the period 2007-2014. Each year, the partitionable universe is that universe of insiders who have at least one trade in each of the preceding three years (so that routine traders and opportunistic traders can be defined). We follow Cohen, Malloy, and Pomorski (2012) to classify insider trades into opportunistic and routine trades. For the classification, an insider must make at least one trade in each of the three preceding years. A routine trader is an insider who placed a trade in the same calendar month for at least three consecutive years. Otherwise, the trader is considered as an opportunistic. An insider will be classified as either routine or opportunistic at the beginning of each year and all subsequent trades after the classification are then classified as either routine buy (sell) or opportunistic buy (sell) trades. Panel A presents the insider-level characteristics, Panel B presents the delay in reporting insider trades, and Panel C provides the firm-level characteristics. All numbers are full sample averages (medians), except when indicated by #, which is the total number over the entire sample period. Stock return is the return on the firm. Stock volatility is the daily standard deviation of past 90-day stock returns. Firm size is defined as the market capitalization of the firm in millions of Indian Rupees (INR). Book-market is the ratio of book value per share to the market price of the firm. Turnover is the percentage of the total number of shares traded by the total number of shares outstanding of the firm. D(Announcement) is the dummy variable that takes value of one if the trading day is within 30 days after the earnings announcement and zero else. Number of analysts measures the monthly analyst coverage in the firm. Total assets is the value of the total assets of the firm in millions of INR. Leverage is the ratio of total debt to shareholders' equity capital of the firm. Return on equity is the annualized return on shareholders' equity capital of the firm. Cash Holdings is the total cash and cash equivalents of funds scaled by the total assets of the firm. Current ratio is the ratio of current assets to current liabilities of the firm. Firm age is the difference between the current year and the year of establishment of the firm. Board size is the number of members on the board of the firm. Board independence is the percentage of independent directors on the board of the firm. Price synchronicity is defined as $\log[R^2/(1-R^2]$ where R^2 is constructed using the CAPM model, estimated using daily returns in each year. Idiosyncratic volatility is the variance of the residuals of the CAPM model using daily returns each year. Stock illiquidity is the percentage of days with zero stock return. Average FII's ownership is the percentage of shares owned by FII, average DII's ownership is the percentage of shares owned by domestic institutional investors (DII), and average promoters' ownership is the percentage of shares owned by promoters of the company.

Table 2: Information content of insider trades

	Future one-month stock return					
	All trades			Large insider trades		
	(1)	(2)	(3)	(4)	(5)	(6)
D (Opportunistic buy)	1.9512***		1.6013***	2.4184***		2.3310***
	(3.73)		(3.44)	(2.89)		(2.77)
D (Routine buy)	0.5473		0.4746	0.6242		0.5838
	(0.82)		(0.72)	(0.77)		(0.82)
D (Opportunistic sell)		-1.0926	-0.9913		-0.7937*	-0.6679*
		(-0.62)	(-0.43)		(-1.76)	(-1.68)
D (Routine sell)		0.3753	0.3088		0.3203	0.2038
		(1.00)	(0.94)		(0.86)	(0.76)
Ln (Firm size)	-0.8388***	-0.8503***	-0.8645***	-0.8245***	-0.8253***	-0.8325***
	(-5.84)	(-6.07)	(-6.09)	(-5.84)	(-5.88)	(-5.92)
Ln (Book-market)	0.3745***	0.3620***	0.3891***	0.3586***	0.3478***	0.3615***
	(8.59)	(8.61)	(8.65)	(8.58)	(8.57)	(8.61)
Past month return	0.0481***	0.0480***	0.0481***	0.0480***	0.0479***	0.0479***
	(9.52)	(9.48)	(9.51)	(9.48)	(9.47)	(9.47)
Past year return	0.0014	0.0013	0.0014	0.0013	0.0013	0.0013
	(0.96)	(0.94)	(0.97)	(0.91)	(0.93)	(0.92)
Time (month) fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.0205	0.0202	0.0206	0.0206	0.0205	0.0207
# of firms	880	880	880	880	880	880
# of observations	84,480	84,480	84,480	84,480	84,480	84,480

This reports the pooled regression of returns on the indicator of opportunistic and routine insider trades in the prior month, over the 2007-2014 sample period. The dependent variable is the one-month future stock return. D(Opportunistic buy) is a binary variable that takes the value of 1 if there were any buys on a given firm in the prior month by an opportunistic insider. D(Routine buy), D(Opportunistic sell), and D(Routine sell) are defined similarly. We sort the entire sample trades for each category of insider trades into terciles and designate the top 33rd percentile as the larger insider trades. Ln (Firm size) and Ln (Book-market) are the natural log of the market capitalization and book-to-market ratio in the prior month. The past month (year) return is the return of the given firm over the prior month (year, excluding the prior month (*t*-2, *t*-12)). We control for time (month). Standard errors are corrected for clustering at the firm level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 3: Univariate results related to FII's trading

Panel A. Trading by FII

Panel A.1. Net equity trading by FII in basis points

	Mean	Median	Std. Dev.
All firms	0.1031	0.0823	6.0812
Entire universe	0.1100	0.0870	6.1441
Partitionable universe	0.1416	0.0992	6.2734

Panel A.2. Number of shares (in thousands) traded by FII

	Mean	Median	Std. Dev.
All firms	2.59	0.50	280.14
Entire universe	3.50	0.61	289.42
Partitionable universe	4.75	0.72	291.62

Panel A.3. Value of shares (in million INR) traded by FII

	Mean	Median	Std. Dev.
All firms	2.63	0.14	35.71
Entire universe	3.95	0.14	36.22
Partitionable universe	4.82	0.23	38.46

Panel B. Net equity trading before and after insider trades (in bps)

Insiders' trades	(-30, 0) (1)	(1, 30) (2)	Difference (2)-(1)	*t*-stat
Opportunistic buy	1.0983	1.7103	0.6120***	9.06
Opportunistic sell	-0.4315	-0.7415	-0.3100***	-3.05
Routine buy	0.7772	0.9315	0.1543**	2.18
Routine sell	-0.4177	-0.4424	-0.0247	-1.54

Panel C. Days of first (buy/sell) trading by FII following insider trades

Insider Trades	Mean	Median	Std. Dev.
Opportunistic buy	5.11	3.00	6.25
Opportunistic sell	9.72	5.00	7.00
Routine buy	9.54	6.00	8.09
Routine sell	10.06	6.00	6.88

Panel A of this table presents the summary statistics for NET_{it} by FII for all firms, entire insider universe and partitionable insider universe over the period 2007-2014. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t.* Each year, the *partitionable* universe is those insiders who have at least one trade in each of the preceding three years (so that routine traders and opportunistic traders can be defined). We follow Cohen, Malloy, and Pomorski (2012) to classify insider trades into opportunistic and routine insider trades (see notes to Table 1 for the classification details). Panel B reports the NET_{it} 30 days before and after opportunistic and routine insider trades. Panel C reports the days of first trading by FII following each insider trade. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 4: Mimicking hypothesis

				Larger insider trades		
	(1-15)	(1-20)	(1-30)	(1-15)	(1-20)	(1-30)
	(1)	(2)	(3)	(4)	(5)	(6)
Opportunistic buy	0.0022**	0.0029***	0.0040***	0.0036***	0.0042***	0.0057***
	(2.40)	(2.66)	(3.38)	(2.81)	(2.77)	(3.24)
Routine buy	-0.0008	0.0010	0.0003	-0.0025	0.0028	0.0033
	(-0.29)	(0.30)	(0.10)	(-1.29)	(1.00)	(1.16)
Opportunistic sell	-0.0053	-0.0033	-0.0024	0.0012	0.0020	0.0024
	(-0.80)	(-0.56)	(-0.43)	(1.14)	(1.48)	(1.03)
Routine sell	-0.0004	-0.0013	-0.0011	-0.0004	-0.0013	-0.0008
	(-0.22)	(-0.63)	(-0.72)	(-0.21)	(-0.51)	(-0.44)
Stock return	0.2489***	0.2534***	0.2637***	0.3276***	0.2533***	0.2633***
	(2.88)	(3.06)	(3.49)	(3.94)	(3.05)	(3.78)
Ln (Firm size)	0.0080	0.0074	0.0092	0.0163*	0.0085	0.0028
	(1.35)	(1.11)	(1.52)	(1.79)	(1.05)	(0.38)
Ln (Book-market)	-0.0255**	-0.0246***	-0.0228***	-0.0208**	-0.0491**	-0.0621***
	(-2.43)	(-2.59)	(-2.77)	(-2.13)	(-2.35)	(-2.68)
Turnover	0.2545	1.3236*	1.8889**	0.6366	0.0470	0.0781
	(0.21)	(1.68)	(1.99)	(0.35)	(0.03)	(0.06)
Stock volatility	-0.3815	-0.2460	-0.2490	-0.3567	-0.3051	-0.3299
	(-1.30)	(-0.85)	(-0.89)	(-0.75)	(-0.67)	(-0.77)
D (Announcement)	0.0010	0.0013	0.0020	0.0025	0.0043	0.0074
	(0.37)	(0.47)	(0.75)	(0.37)	(0.68)	(1.38)
Ln (1+Number of analysts)	0.0010	0.0071	0.0045	0.0029	0.0078	0.0033
	(0.02)	(0.12)	(0.86)	(0.78)	(0.63)	(0.12)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.1355	0.1136	0.0877	0.1390	0.1269	0.1081
# of firms	438	453	467	350	360	375
# of observations	60,498	78,249	119,323	15,970	20,608	31,533

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII after the disclosure of insider trades for different periods (15, 20 and 30 days after the disclosure of insider trades) and the opportunistic and routine trades over the sample period 2007-2014. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t*. The main independent variables are Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell. Opportunistic buy (sell) is the number of shares bought (sold) by opportunistic insiders scaled by the previous day's number of shares outstanding of the firm on the reported date. Routine buy (sell) is the number of shares bought (sold) by routine insiders scaled by the previous day's number of shares outstanding of the firm on the reported date. The control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We sort the entire sample trades for each category of insider trades into terciles and designate the top 33rd percentile as the larger insider trades. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 5: Reverse causality

	(-15, -1)	(-20, -1)	(-30, -1)
	(1)	(2)	(3)
Opportunistic buy	-0.0001	-0.0010	-0.0014
	(-0.05)	(-0.41)	(-0.80)
Routine buy	-0.0101	-0.0115	-0.0060
	(-1.09)	(-1.02)	(-0.91)
Opportunistic sell	-0.0018	-0.0015	-0.0014
	(-1.45)	(-1.47)	(-1.39)
Routine sell	0.0008	0.0010	0.0000
	(0.16)	(0.16)	(0.01)
Stock return	0.3345***	0.3335***	0.2986***
	(8.06)	(7.91)	(7.01)
Ln (Firm size)	0.0078	0.0068	0.0057
	(1.57)	(1.38)	(1.29)
Ln (Book-market)	-0.0264***	-0.0238**	-0.0223**
	(-2.80)	(-2.48)	(-2.57)
Turnover	1.2855***	1.2309***	0.9964**
	(2.92)	(3.18)	(2.46)
Stock volatility	-0.2076	-0.2243	-0.1756
	(-0.81)	(-0.94)	(-0.78)
D (Announcement)	0.0023	0.0023	0.0017
	(0.99)	(0.98)	(0.75)
Ln (1+Number of analysts)	0.0043	0.0047	0.0019
	(0.10)	(0.11)	(0.53)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R^2	0.1711	0.1598	0.1430
# of firms	426	440	456
# of observations	40,108	51,915	78,559

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII before the disclosure of insider trades and the opportunistic and routine insider trades in Models (1) – (3) over the sample period 2007-2014. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t*. The main independent variables Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell are defined in the notes to Table 4. All the control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 6: Propensity score matching

Panel A: Pre-match propensity score regression and post-match diagnostic regression

	Dummy = 1 if in treatment group; 0 if in control group	
	Pre-match	Post-match
	(1)	(2)
Ln (Firm size)	0.1278***	-0.0344
	(7.64)	(-1.24)
Leverage	0.0005	-0.0025
	(0.56)	(-1.21)
Return on equity	0.2904***	0.0038
	(4.34)	(1.15)
Cash holdings	-0.2882	0.0881
	(-1.17)	(0.24)
Current ratio	-0.0000	0.0006
	(-0.08)	(0.52)
Ln (Firm age)	-0.1033*	-0.0531
	(-1.66)	(-0.61)
Ln (Board size)	0.2235**	-0.0024
	(2.26)	(-0.01)
Board independence	0.4110**	-0.0573
	(2.08)	(-0.22)
Industry fixed effects	Yes	Yes
Pseudo R^2	0.0592	0.0313
# of observations	55,704	29,517

Panel B: Estimated propensity score distributions

	Obs.	Min	P5	P50	Mean	SD	P95	Max
Treatment	462	0.125	0.268	0.503	0.469	0.117	0.632	0.748
Control	462	0.131	0.268	0.505	0.473	0.12	0.642	0.757
Difference	-	-0.006	0.000	-0.002	-0.004	-0.003	-0.01	-0.009

Panel C: Difference in firm characteristics

	Treatment	Control	Difference	*t*-statistics
	(1)	(2)	(1)-(2)	
Ln (Firm size)	8.136	8.255	-0.118	-1.14
Leverage	1.471	1.692	-0.221	-0.71
Return on equity	0.116	0.115	0.002	0.34
Cash holdings	0.063	0.062	0.001	0.37
Current ratio	3.110	3.589	-0.479	-0.64
Ln (Firm age)	3.247	3.252	-0.006	-0.44
Ln (Board size)	2.263	2.273	-0.010	-1.62
Board independence	0.470	0.468	0.001	0.55

This table reports the results of PSM. The treatment group is defined as the firms where both (opportunistic and routine) insiders and FII trade, whereas the control group is defined as the firms where FII trade, but insiders do not. We use PSM with the nearest neighborhood of 0.01 caliper using various firm-level characteristics to identify matched control groups. Panel A presents the parameter estimates from the probit model used to estimate the propensity scores for the treatment and control groups. The dependent variable is 1 if in the treatment group and 0 if in the control group. The firm-level characteristics are defined in the notes to Table 1. We control for industry fixed effects. Standard errors are corrected for clustering at the industry level. Panel B reports the distribution of estimated propensity scores post-matching. Panel C reports the univariate comparison of the firm's characteristics between the treatment and the control, and their corresponding *t*-statistics are reported in parentheses below the regression coefficients. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 7: Difference-in-differences in FII's equity trading

Panel A: Net equity trading difference-in-differences test

	Treatment			Control			Mean DiD estimator
	Opportunistic buy			Opportunistic buy			
Window period (days)	Before Day 0 (1)	After Day 0 (2)	Difference (3) = (2)-(1)	Before Day 0 (4)	After Day 0 (5)	Difference (6) = (5)-(4)	(7) = (3)-(6)
-15 to 15	1.6291	2.5921	0.9630***	1.6036	1.9049	-0.3013	1.2643**
			(4.51)			(-0.60)	(2.00)
-20 to 20	1.4635	2.5342	1.0707***	1.4277	1.5349	0.1073	0.9634***
			(5.87)			(0.21)	(2.65)
-30 to 30	1.3110	2.2991	0.9881***	1.3687	1.1650	-0.2127	1.2008***
			(7.23)			(-0.53)	(2.67)
	Opportunistic sell			Opportunistic sell			
-15 to 15	-0.1840	-0.7073	-0.5232***	-0.1767	-0.2335	-0.0568	-0.4664
			(-3.36)			(-0.12)	(-1.01)
-20 to 20	-0.2992	-0.7580	-0.4588***	-0.2270	-0.2240	0.0030	-0.4618
			(-3.50)			(0.00)	(-1.14)
-30 to 30	-0.2509	-0.6954	-0.4445***	-0.2211	0.0648	0.2859	-0.7304**
			(-4.45)			(0.86)	(-2.27)

Panel B: Net equity trading difference-in-differences regression analysis

	Opportunistic buy			Opportunistic sell		
	(-15, 15) (1)	(-20, 20) (2)	(-30, 30) (3)	(-15, 15) (4)	(-20, 20) (5)	(-30, 30) (6)
$Opp\ buy\ event_t \times TRMT_i$	0.6629***	0.6493***	0.4912**			
	(2.88)	(2.91)	(2.13)			
$Opp\ sell\ event_t \times TRMT_i$				-0.1945	-0.1706	-0.2306
				(-0.84)	(-0.71)	(-0.92)
Stock return	0.5618***	0.5313***	0.4714***	0.9655***	0.9757***	0.9214***
	(2.73)	(2.95)	(2.72)	(4.64)	(3.92)	(3.35)
Ln (Firm size)	0.0479**	0.0533*	0.0446*	0.0158*	0.0120*	0.0099*
	(2.18)	(1.96)	(1.92)	(1.91)	(1.89)	(1.89)
Ln (Book-market)	-0.0251	-0.0460	-0.0160	-0.0715**	-0.0655*	-0.0589*
	(-0.14)	(-0.25)	(-0.09)	(-2.01)	(-1.85)	(-1.69)
Turnover	1.0084**	1.1981**	1.3837**	0.8329*	1.6297*	1.8375*
	(2.09)	(2.45)	(2.66)	(1.82)	(1.94)	(1.90)
Stock volatility	-0.0685	-0.1074	-0.0553	-0.0395	-0.0797	-0.0529
	(-0.47)	(-0.65)	(-0.39)	(-0.06)	(-0.01)	(-0.10)
D (Announcement)	0.0140	0.0106	0.0094	0.0012	0.0018	0.0079
	(1.39)	(1.13)	(0.99)	(0.22)	(0.38)	(1.52)
Ln (1+Number of analysts)	0.0046	0.0041	0.0022	0.0044	0.0025	0.00435
	(0.45)	(0.39)	(0.02)	(0.62)	(0.36)	(0.57)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.0965	0.0942	0.0816	0.0929	0.0770	0.0611
# of firms	364	380	392	314	325	341
# of observations	51,847	67,146	102,183	62,754	81,249	123,810

This table reports the DiD test examining how opportunistic insider trades affect the Net Equity Trading (NET_{it}) of FII. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t* (reported in pbs units). The treatment group is defined as the firms where insiders trade whereas the control group is defined as the firms where insiders do not trade. We use PSM with the nearest neighborhood of 0.01 caliper using various firm-level characteristics to identify matched control groups. For each matched control firm, the event date is taken to be the same as that of the matched treatment firm. Panel A provides the DiD test results for NET_{it} before and after the disclosure of opportunistic buy and opportunistic sell trades. Panel B reports the regression estimates of NET_{it} of treatment and control firms surrounding the disclosure of opportunistic and routine insider trades. The dependent variable is NET_{it} by FII. $Opp\ Buy\ Event_t$ ($Opp\ Sell\ Event_t$) is a dummy variable that takes a value of 1 after the disclosure of opportunistic buy (opportunistic sell) and 0 before the disclosure. $TRMT_i$ is a dummy variable that takes a value of 1 for treatment firms and 0 for control firms. All the control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 8: Information environment and FII's mimicking

	Price synchronicity		Idiosyncratic volatility		Stock illiquidity		Promoters' ownership		Cross-listed	
	High	Low	High	Low	High	Low	High	Low	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Opportunistic buy	0.0051***	0.0143	0.0022***	0.0076***	0.0049***	0.0258**	0.0075***	0.0020	0.0025***	0.0067***
	(3.61)	(0.98)	(3.18)	(3.11)	(2.82)	(2.16)	(3.26)	(0.81)	(3.18)	(3.69)
Routine buy	0.0002	0.0104	-0.0092	0.0001	0.0007	0.0076	0.0038	0.0033	0.0083	0.0008
	(0.05)	(0.80)	(-1.49)	(0.64)	(0.53)	(1.09)	(0.33)	(1.03)	(0.47)	(0.22)
Opportunistic sell	-0.0069	0.0031	0.0084	-0.0111	0.0001	0.0071	0.0056	-0.0113	-0.0173	-0.0035
	(-1.11)	(0.76)	(1.71)	(-1.40)	(0.02)	(0.78)	(1.35)	(-1.50)	(-0.41)	(-0.63)
Routine sell	-0.0017	-0.0007	-0.0083	-0.0004	-0.0000	-0.0013	-0.0022	0.0004	-0.0001	-0.0012
	(-0.89)	(-0.32)	(-0.66)	(-0.41)	(-0.01)	(-1.07)	(-0.79)	(0.24)	(-0.06)	(-0.50)
Stock return	0.3121***	0.1851	0.2848***	0.2445**	0.0544	0.3650***	0.3694***	0.0855	0.4132***	0.2262**
	(5.16)	(1.03)	(2.86)	(2.44)	(0.38)	(5.05)	(3.45)	(1.07)	(6.38)	(2.46)
Ln (Firm size)	0.0042	0.0114*	0.0231	0.0092	0.0292	0.0089	0.0132**	0.0006	0.0214**	0.0056
	(0.32)	(1.71)	(1.17)	(1.29)	(0.88)	(1.34)	(2.47)	(0.05)	(2.48)	(0.74)
Ln (Book-market)	-0.0187*	-0.0245	-0.0324*	-0.0274**	-0.0379	-0.0258***	-0.0246**	-0.0186**	-0.0180	-0.0208**
	(-1.75)	(-1.53)	(-1.89)	(-2.14)	(-1.13)	(-2.60)	(-2.50)	(-2.07)	(-0.97)	(-2.17)
Turnover	1.8889*	1.9906	1.5437	3.0605	1.9653	1.6663	1.9340*	2.1916	3.6546***	1.6622
	(1.80)	(1.09)	(1.43)	(1.58)	(1.30)	(1.58)	(1.75)	(1.38)	(4.10)	(1.56)
Stock volatility	-0.0343	-0.4910	-0.2285	-0.3300	-0.5369	-0.0747	-0.0880	-0.6995	-0.4984	-0.2087
	(-0.08)	(-1.08)	(-0.51)	(-1.09)	(-1.07)	(-0.21)	(-0.29)	(-1.43)	(-1.49)	(-0.66)
D (Announcement)	0.0017	0.0023	0.0160	0.0063	0.0126	0.0098	0.0044	0.0057	0.0099	0.0031
	(0.52)	(0.50)	(1.63)	(0.30)	(1.50)	(0.04)	(0.14)	(1.07)	(0.03)	(0.86)
Ln (1+Number of analysts)	0.0048	0.0032	0.0033	0.0066	0.0118	0.0097*	0.0096	0.0034	0.0224***	0.0190
	(0.66)	(0.54)	(0.25)	(1.18)	(1.24)	(1.88)	(1.08)	(0.48)	(2.85)	(0.33)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.0605	0.1145	0.1089	0.0607	0.1406	0.0430	0.0955	0.0863	0.0623	0.0909
# of firms	248	219	221	246	215	252	236	231	89	378
# of observations	68,762	50,561	43,212	76,111	30,164	89,159	65,225	54,098	47,577	71,746

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII (after the disclosure of insider trades for a 30-day period), and the opportunistic and routine trades over the sample period 2007-2014 based on the information environment. The information environment of a firm is measured using stock price synchronicity, idiosyncratic volatility, stock illiquidity, promoter ownership, and cross-listed firms. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t.* The main independent variables are Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell as defined in the notes to Table 4. The control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 9: Reporting delay and FII's mimicking

	Reporting Delay					
	< =1 day	< =3 days	< =7 days	>7 days	>7 & <=15 days	>15 days
	(1)	(2)	(3)	(4)	(5)	(6)
Opportunistic buy	0.0055***	0.0052***	0.0052***	0.0008	0.0012	0.0024
	(3.69)	(4.65)	(3.86)	(0.09)	(1.41)	(1.32)
Routine buy	0.0154	0.0042	0.0005	0.0107	0.0000	0.3075
	(0.86)	(0.71)	(0.10)	(0.51)	(0.01)	(0.83)
Opportunistic sell	-0.0192	-0.0077	-0.0018	-0.1396	-0.0020	-0.0407
	(-1.00)	(-1.19)	(-0.30)	(-0.87)	(-0.35)	(-0.41)
Routine sell	-0.0013	-0.0015	-0.0006	0.0062	-0.0012	-0.0017
	(-0.77)	(-1.09)	(-0.46)	(0.86)	(-0.79)	(-0.97)
Stock return	0.2940***	0.2939***	0.2692***	0.3630**	0.2735***	0.2657***
	(3.74)	(4.04)	(3.42)	(2.53)	(3.52)	(3.26)
Ln (Firm size)	0.0106	0.0115	0.0117*	0.0028	0.0090	0.0167**
	(1.39)	(1.58)	(1.84)	(0.32)	(1.45)	(2.21)
Ln (Book-market)	-0.0181	-0.0224**	-0.0245***	-0.0190**	-0.0214**	-0.0599***
	(-1.65)	(-2.25)	(-2.79)	(-2.22)	(-2.56)	(-4.32)
Turnover	0.2380	0.9114	1.4601	1.0567***	1.9171**	1.3193
	(0.19)	(0.76)	(1.44)	(3.99)	(2.00)	(0.35)
Stock volatility	-0.2729	-0.1884	-0.4029	-0.4061*	-0.2757	0.1307
	(-0.47)	(-0.37)	(-1.18)	(-1.68)	(-0.97)	(0.19)
D (Announcement)	0.0011	0.0012	0.0012	0.0030	0.0016	0.0117*
	(0.31)	(0.04)	(0.45)	(0.74)	(0.58)	(1.75)
Ln (1+Number of analysts)	0.0041	0.0043	0.0045	0.0122	0.0045	0.0112
	(0.61)	(0.75)	(0.83)	(1.07)	(0.85)	(0.46)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.1180	0.1028	0.0972	0.1727	0.0876	0.1269
# of firms	278	373	445	228	205	100
# of observations	50,142	85,498	94,781	24,542	19,814	4,728

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII (after the disclosure of insider trades for a 30-day period), and the opportunistic and routine trades over the sample period 2007-2014 based on reporting delay. Reporting delay is calculated as a difference in the transaction date and the reported date. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t.* The main independent variables are Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell as defined in the notes to Table 4. The control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 10: Who mimics insider trades?

	Past FII	New FII	Existing FII
	(1)	(2)	(3)
Opportunistic buy	-0.0000	0.0051**	0.0073***
	(-0.01)	(2.54)	(4.42)
Routine buy	0.0031	-0.0010	0.0009
	(1.22)	(-0.19)	(0.23)
Opportunistic sell	-0.0025	0.0045	-0.0026
	(-1.12)	(0.82)	(-0.52)
Routine sell	-0.0001	0.0007	-0.0012
	(-0.16)	(1.19)	(-1.14)
Stock return	0.0584***	0.1664***	0.1917***
	(3.29)	(3.86)	(2.60)
Ln (Firm size)	0.0021	0.0039	0.0103**
	(0.61)	(0.83)	(1.99)
Ln (Book-market)	-0.0060	-0.0035	-0.0229***
	(-1.14)	(-0.34)	(-2.81)
Turnover	0.5887	2.8351*	2.0936**
	(0.41)	(1.86)	(2.01)
Stock volatility	-0.3670	-0.2127	-0.4017
	(-1.25)	(-0.48)	(-1.63)
D (Announcement)	0.0034*	0.0022	0.0022
	(1.74)	(0.56)	(0.93)
Ln (1+Number of analysts)	0.0088*	0.0061	0.0042
	(1.86)	(0.72)	(0.92)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R^2	0.1550	0.4620	0.0856
# of firms	348	331	426
# of observations	76,299	26,932	111,882

This table shows the result of regressions between Net Equity Trading (NET_{it}) by Past FII, New FII, and Existing FII, 30 days after the disclosure of insider trading, and the opportunistic and routine trades over the sample period 2007-2014 for. NET_{it} is defined as the number of shares traded by FII (Past, New and Existing) scaled by previous day's number of shares outstanding of firm *i* in day *t*. We calculate the daily portfolio holding of each of the FII for each firm. We classify each of the FII as (a) past FII if portfolio holding in a firm in the previous trading day is either zero or negative, (b) new FII if there is no portfolio holding in a firm in the previous trading day, and (c) existing FII if portfolio holding in a firm in the previous trading day is positive. The main independent variables are Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell as defined in the notes to Table 4. The control variables are defined in the notes to Table 1. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 11: Calendar-time portfolio analysis

Portfolio	Average raw return (%)	Average market adjusted (%)	Intercept			Coefficient for the four-factors model				R^2
			CAPM	Three-factors	Four-factors	$R_{mt} - R_{ft}$	SMB_t	HML_t	WML_t	
Panel A. Buy Trades										
Opportunistic buy (OB)	2.88***	2.24***	2.20***	2.13***	2.26***	0.65**	0.20	0.10	-0.34	0.23
	(3.61)	(5.49)	(3.55)	(3.40)	(3.29)	(2.18)	(0.54)	(0.40)	(-1.18)	
Routine buy (RB)	1.09*	1.43**	1.18	1.22	1.37	0.80	-0.15	0.60	-0.16	0.16
	(1.81)	(2.15)	(1.21)	(1.22)	(1.22)	(1.64)	(-0.25)	(0.99)	(-0.44)	
Long OB – Long RB	1.79***	0.81***	1.01***	0.91***	0.89***	-0.15	0.35	-0.50	-0.19	0.19
	(3.46)	(3.14)	(3.20)	(3.16)	(3.21)	(-0.26)	(0.50)	(-0.75)	(-0.41)	
Panel B. Sell Trades										
Opportunistic sell (OS)	-0.72**	-0.79**	-0.61	-0.60	-0.60	0.15	0.21	-0.02	0.00	0.09
	(-2.04)	(-2.18)	(-1.16)	(-1.17)	(-1.03)	(1.00)	(1.24)	(-0.19)	(0.00)	
Routine sell (RS)	0.24	0.34	0.35	0.32	0.40	0.01	0.21*	-0.12	-0.09	0.09
	(0.08)	(0.87)	(0.77)	(0.73)	(0.92)	(0.22)	(1.91)	(-1.13)	(-1.43)	
Short OS – Short RS	0.96	1.12	0.95	0.92	1.00	.-0.14	-0.00	-0.10	-0.09	0.09
	(1.37)	(1.12)	(1.38)	(1.36)	(1.37)	(-0.83)	(-0.01)	(-0.66)	(-0.69)	
Panel C. Long-Short Strategy										
Long OB + Short OS	3.60***	3.03***	2.81***	2.73***	2.86***	0.50	-0.01	0.12	-0.34	0.26
	(3.46)	(5.42)	(3.73)	(3.60)	(3.44)	(1.49)	(-0.03)	(0.44)	(-1.09)	
Long RB + Short RS	0.85	1.09	0.83	0.90	0.97	0.79	-0.37	0.72	-0.06	0.17
	(1.61)	(1.02)	(1.00)	(1.03)	(1.00)	(1.60)	(-0.61)	(1.16)	(-0.18)	

This table reports the percentage monthly returns earned by FII on portfolios: Opportunistic buy (OB), Routine buy (RB) and Long OB-Long RB portfolio in Panel A, Opportunistic sell (OS), Routine sell (RS) and Long OS-Long RS portfolio in Panel B, and Long OB+Short OS and Long RB+Short RS portfolio in Panel C. We calculate the one-month mean raw return and one-month average adjusted return on each trade conducted by FII (within 30 days of reporting of insider trades) following each category of insider trade for each calendar month between January 2007 and December 2014. The average raw return is the average monthly percentage return earned by each portfolio. The average market-adjusted return is the average raw return less return on the market return. The CAPM Intercept is the estimated intercept using CAPM from a time-series regression of the portfolio return ($R_{pt} - R_{ft}$) on the market excess return ($R_{mt} - R_{ft}$). The Three-Factor Intercept is the estimated intercept from a time-series regression of the portfolio return on market excess return ($R_{mt} - R_{ft}$), a size portfolio (SMB_t), and a book-to-market portfolio (HMT_t). The Four-Factor Intercept is estimated by adding a price momentum portfolio (WML_t). Opportunistic buy, Routine buy, Opportunistic sell, and Routine sell are defined in the notes to Table 4. *t*-statistics appear in parentheses below the returns and the coefficient estimates. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 12: Difference in CARs between the treatment and the control firms

	Opportunistic buy				Opportunistic sell			
	(-20, -1)	(1, 5)	(1, 10)	(1, 20)	(-20, -1)	(1, 5)	(1, 10)	(1, 20)
Treatment (1)	-0.951	0.629	0.926	2.010	2.429	-0.297	-0.207	-0.153
t-test B	-2.50**	5.08***	5.97***	7.44***	3.71***	-2.44**	-2.44**	-2.32**
t-stat K	-2.37**	4.82***	5.65***	7.05***	3.42***	-2.25**	-2.25**	-2.13**
Control (2)	-0.781	0.136	0.613	0.924	0.894	0.278	0.356	0.487
t-test B	-3.59***	1.30	4.01***	3.55***	5.09***	1.93*	1.18	1.48
t-stat K	-2.90***	1.05	3.24***	2.86***	4.23***	1.61*	0.98	1.23
Diff (1-2)	-0.170	0.493	0.314	1.086	1.535	-0.575	-0.563	-0.640
t-test	-4.99***	3.01***	2.92***	3.01***	2.88**	-2.40**	-2.15**	-1.21

This table reports the DiD test examining the difference in cumulative abnormal returns (CARs) between the treated and control group. The treatment group is defined as the firms where both (opportunistic and routine) insiders and FII trade whereas the control group is defined as the firms where only FII trade but insiders do not. We use PSM with the nearest neighborhood of 0.01 caliper using various firm-level characteristics to identify matched control groups. The CARs for opportunistic buy and sell trades on treated and control firms are calculated using the market model. The estimation period is from -200 to -21 days prior to the disclosure of insider trading. We analyze CARs for different event periods ranging from 20 days before the disclosure of insider trades and five, 10 and 20 days after the disclosure of insider trades. *t-test B* and *t-test K* denote the standardized cross-sectional test statistics proposed by Boehmer, Masumeci, and Poulsen (1991) and Kolari and Pynnönen (2010) respectively. *t-test* is the test statistics for the difference in CARs of opportunistic and routine trades. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 13: Robustness tests: Change in insider trading regulation

Panel A: Mean differences insider trading (in bps) pre-post regulation

	Pre-regulation (1)	Post-regulation (2)	Difference |(2)| - |(1)|
Opportunistic buy	9.94	5.20	-4.74***
			(-8.81)
Opportunistic sell	-10.23	-6.37	-3.85***
			(3.31)
Routine buy	7.20	5.15	-2.05
			(-1.38)
Routine sell	-6.01	-4.91	-1.01
			(-1.18)

Panel B: Information content of insider trades

	Post regulation (1)	Pre-post regulation (2)
D (Opportunistic buy)	1.1715***	1.5730***
	(3.17)	(3.43)
D (Routine buy)	0.6406	0.3118
	(0.47)	(1.28)
D (Opportunistic sell)	-0.4000	-0.1136
	(-0.77)	(-1.09)
D (Routine sell)	-0.2973	-0.1731
	(-0.29)	(-1.08)
D (Opportunistic buy) × D ($Regulation_{2015}$)		-0.6976**
		(-2.55)
D (Opportunistic sell) × D ($Regulation_{2015}$)		-0.0347
		(-1.63)
D (Routine buy) × D ($Regulation_{2015}$)		-0.0788
		(-0.57)
D (Routine sell) × D ($Regulation_{2015}$)		0.0520
		(0.06)
D ($Regulation_{2015}$)		-1.0821***
		(-5.77)
Controls	Yes	Yes
Time (month) fixed effects	Yes	Yes
Adjusted R^2	0.0801	0.0240
# of firms	809	848
# of observations	14,868	28,915

Panel C: Mimicking by FPIs

	Post-regulation (1)	Pre-post regulation (2)
Opportunistic buy	0.0027**	0.0014***
	(2.59)	(2.97)
Routine buy	0.0112	0.0025
	(0.19)	(1.21)
Opportunistic sell	-0.0114	-0.0064
	(-0.24)	(-1.12)
Routine sell	-0.0090	-0.0011
	(-0.45)	(-0.18)
Opportunistic buy × D ($Regulation_{2015}$)		-0.0012**
		(-2.49)
Opportunistic sell× D ($Regulation_{2015}$)		-0.0007
		(-0.13)
Routine buy × D ($Regulation_{2015}$)		-0.0011
		(-0.63)
Routine sell × D ($Regulation_{2015}$)		-0.0035
		(-0.90)

D (Regulation$_{2015}$)		0.4917
		(0.82)
Controls	Yes	Yes
Time (month) fixed effects	Yes	Yes
Adjusted R^2	0.0611	0.0773
# of firms	175	313
# of observations	20,933	59,895

Panel A reports the opportunistic and routine insider trade size (bps) before and after the effective date (15th May 2015) of insider trading regulation over the sample period 2014-2016. Panel B A reports the pooled regression of returns on the indicator of opportunistic and routine insider trades in the prior month, over the 2014-2016 period. The dependent variable is the one-month future stock return. All variables are as previously defined in Table 2. D (Regulation$_{2015}$) is a dummy variable that takes value of 1 for days after May 15, 2015. Panel C shows the result of regressions between Net Equity Trading (NET_{it}) by FII after the disclosure of insider trades for 30 days after the disclosure of insider trades and the opportunistic and routine trades over the sample period 2014-2016. All variables are as previously defined in Table 4. Model (1) of both panels shows the results for the post-regulation period (May 15, 2015 to December 31, 2016), whereas Model (2) of both panels shows the result for pre and post regulation period (January 1, 2014 to December 31, 2016). *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table 14: Robustness tests: Trade-level definition of opportunistic and routine traders

Panel A: Mimicking hypothesis

				Large insider trades		
	(1-15)	(1-20)	(1-30)	(1-15)	(1-20)	(1-30)
	(1)	(2)	(3)	(4)	(5)	(6)
Opportunistic buy	0.0017***	0.0022***	0.0031***	0.0021**	0.0030***	0.0036***
	(2.68)	(3.93)	(5.17)	(2.42)	(3.77)	(5.17)
Opportunistic sell	0.0012	0.0022	0.0012	-0.0015	0.0002	-0.0005
	(0.35)	(0.92)	(0.78)	(-0.39)	(0.06)	(-0.15)
Routine buy	-0.0018	-0.0000	-0.0000	0.0001	-0.0000	0.0002
	(-0.31)	(-0.07)	(-0.04)	(0.11)	(-0.02)	(0.31)
Routine sell	-0.0088	-0.0055	-0.0033	0.0009	0.0002	0.0010
	(-1.51)	(-1.15)	(-1.01)	(0.27)	(0.09)	(0.37)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.1118	0.1117	0.1022	0.1512	0.1412	0.1392
# of firms	440	455	469	359	372	381
# of observations	60,522	78,277	119,377	15,983	20,429	29,501

Panel B: Calendar-time portfolio analysis

Portfolio	Average raw return (%)	Average market adjusted (%)	Intercept			Coefficient for the four-factors model				R^2
			CAPM	Three-factors	Four-factors	$R_{mt} - R_{ft}$	SMB_t	HML_t	WML_t	
Panel A. Buy Trades										
Opportunistic buy (OB)	2.78***	1.99***	2.52***	2.39***	2.79***	0.38*	.09	-0.08	-0.40***	0.31
	(5.05)	(5.03)	(5.00)	(4.78)	(4.96)	(1.73)	(0.30)	(-0.44)	(-2.45)	
Routine buy (RB)	1.49**	1.24***	1.59**	1.42***	1.88**	0.39	0.05	-0.05	-0.69**	0.23
	(2.31)	(2.45)	(2.35)	(2.14)	(2.45)	(0.79)	(0.10)	(-0.12)	(-2.12)	
Long OB – Long RB	1.29***	0.75***	0.93***	0.97***	0.91***	-0.01	0.04	-0.03	0.29	0.25
	(3.35)	(3.33)	(3.25)	(3.24)	(3.53)	(-0.03)	(0.07)	(-0.07)	(0.81)	
Opportunistic sell (OS)	-1.14**	-0.42**	-0.55	-0.46	-0.31	0.10	0.12	-0.04	0.08	0.12
	(-2.47)	(-2.22)	(-1.27)	(-1.05)	(-0.70)	(0.70)	(1.30)	(-0.59)	(0.61)	

Routine sell (RS)	-0.05	-0.07	-0.05	-0.03	-0.02	0.09	0.15	-0.05	0.05	0.14
	(-0.45)	(-0.48)	(-0.15)	(-0.94)	(-0.62)	(0.65)	(1.26)	(-0.52)	(0.50)	
Short OS – Short RS	-1.00	-0.25	-0.30	-0.03	0.01	0.01	0.03	0.01	0.02	0.13
	(-0.08)	(-0.99)	(-0.07)	(-0.05)	(0.03)	(0.06)	(0.19)	(0.78)	(0.15)	
Long OB + Short OS	3.92***	2.41***	3.07***	2.85***	3.10***	0.28	-0.03	-0.03	-0.47**	0.34
	(4.31)	(4.72)	(3.98)	(3.87)	(4.29)	(1.06)	(-0.09)	(-0.18)	(-2.30)	
Long RB + Short RS	1.54	1.31	1.64	1.45	1.90	0.3052	-0.0959	-0.0942	-0.7432**	0.26
	(1.08)	(1.09)	(0.89)	(0.74)	(1.14)	(0.60)	(-0.20)	(-0.23)	(-2.18)	

Panel C: Abnormal return of mimickers (in %)

		Opportunistic buy				Opportunistic sell			
		(-20, -1)	(1, 5)	(1, 10)	(1, 20)	(-20, -1)	(1, 5)	(1, 10)	(1, 20)
Treatment (1)		0.781	0.729	1.206	2.010	2.429	-0.297	-0.207	-0.153
	t-test B	2.50**	5.08***	5.97***	7.44***	5.09***	-2.93***	-2.90***	-2.33**
	t-test K	2.37**	4.82***	5.65***	7.05***	4.79***	-2.73***	-2.70***	-2.02**
Control (2)		0.790	0.197	0.626	1.241	2.082	0.175	0.290	0.307
	t-test B	1.68*	1.87*	3.95***	4.62***	3.80***	1.25	1.97*	1.48
	t-test K	1.56	1.73*	3.67***	4.28***	3.29***	1.08	1.71*	1.23
Diff (1-2)		-0.009	**0.532**	**0.580**	**0.769**	0.347	**-0.472**	**-0.498**	-0.460
	t-test	-0.02	**2.57****	**2.73*****	**2.65*****	0.59	**-2.83*****	**-2.55****	-0.57

This table shows the result for robustness tests for the mimicking hypothesis in Panel A, calendar-time portfolio analysis in Panel B, and CARs for treatment and control firms for opportunistic buy and sell trades in Panel C using a trade-level definition of opportunistic and routine traders. For the trade-level classification of inside traders, we examine the insider trading patterns for at least three preceding years. If an insider traded stock in the same calendar month in three consecutive years, all subsequent trades that he or she made in the same month are labeled as routine and trades made in a different month are labeled opportunistic. Panels A, B, and C replicate the results in Table 4, Table 11, and Table 12 respectively using the trade-level definition. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

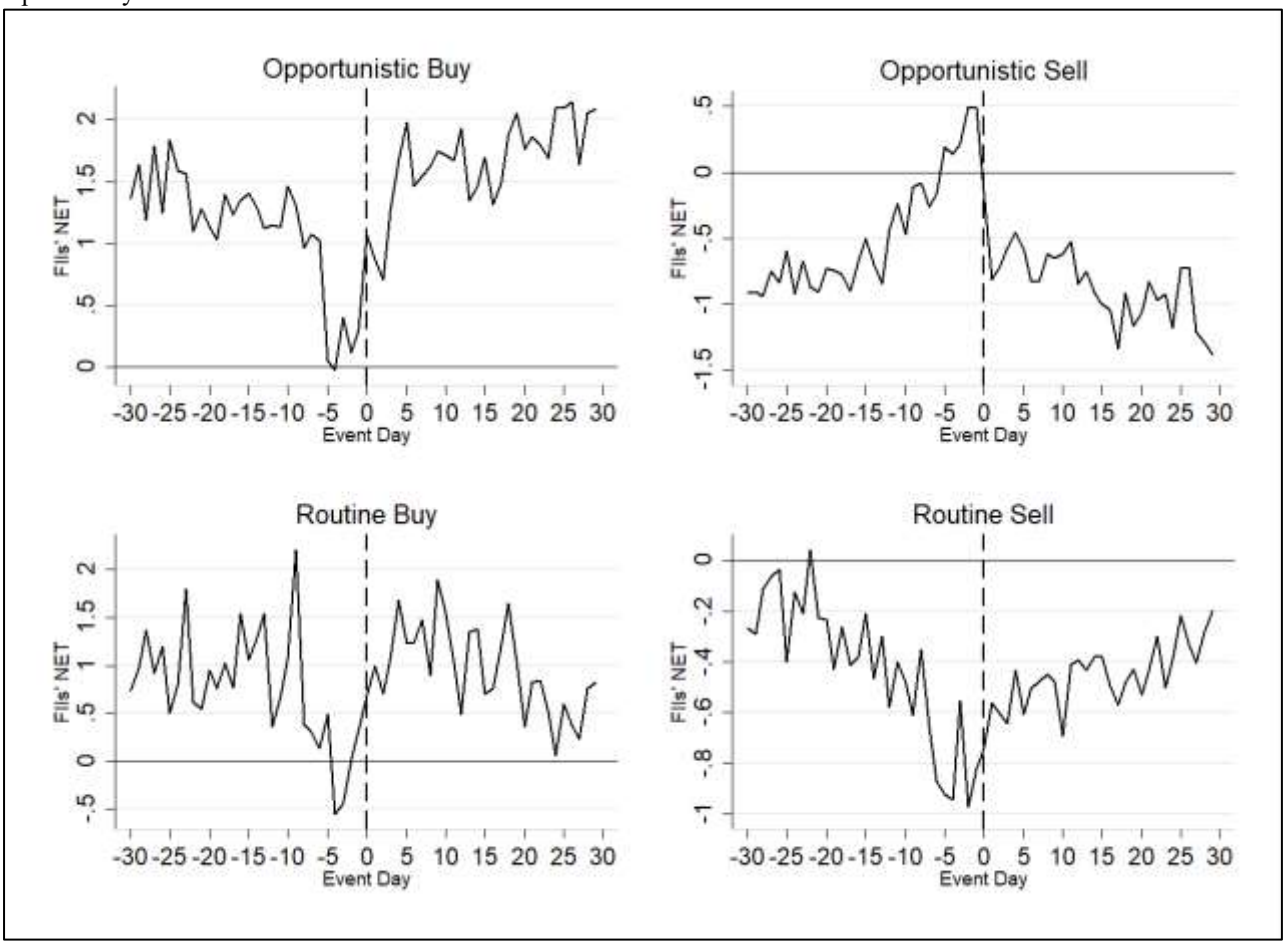
Table 15: Robustness tests: Using an alternative definition of FII's trading

	(1)	(2)	(3)
Number of opportunistic buys	0.1280***		0.1281***
	(3.55)		(3.53)
Number of routine buys	-0.0157		-0.0157
	(-0.38)		(-0.38)
Number of opportunistic sells		-0.2112**	-0.2114**
		(-2.86)	(-2.87)
Number of routine sells		0.0006	0.0089
		(0.01)	(0.23)
Ln (Firm size)	0.1002***	0.1020***	0.0992***
	(5.03)	(5.44)	(4.64)
Leverage	0.0230**	0.0231***	0.0230***
	(3.06)	(3.24)	(3.22)
Return on equity	0.2713***	0.2818**	0.2706***
	(3.19)	(2.89)	(3.13)
Cash holdings	0.9148*	0.8276	0.9126*
	(1.94)	(1.72)	(1.92)
Current ratio	0.0002	0.0002	0.0002
	(0.14)	(0.10)	(0.14)
Ln (Firm age)	-0.0171	-0.0287	-0.0162
	(-0.37)	(-0.67)	(-0.35)
Ln (Board size)	-0.1998	-0.2205	-0.1968
	(-0.95)	(-1.00)	(-0.91)
Board independence	0.4045	0.3637	0.4057
	(1.16)	(0.95)	(1.16)
Time (quarter) fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R^2	0.0273	0.0233	0.0265
# of firms	423	423	423
# of observations	2,482	2,482	2,482

This table shows the result of regressions between changes in holdings by FII and the lagged routine and opportunistic insider trades over the sample period 2007-2014. The dependent variable is quarterly changes in holdings by FII in firm *i* in quarter *t.* In Models (1) – (3), Number of opportunistic buys (sells) is the log of 1+number of opportunistic trades in the previous two quarters and Number of routine buys (sells) is the log of 1+number of routine trades in the previous two quarters of the firm. Control variables are defined in the notes to Table 1. We control for time (quarter) and firm fixed effects. Standard errors are corrected for clustering at the firm and time (quarter) level. *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Figure 1: FII's net equity trading before and after the insider trades

This figure presents the FII's average net equity trading 30 days before and after each insider trade. Day 0 represents the reported day of the insider transaction.



Internet Appendix for

"Mimicking Insider Trades"

Internet Appendix A: Snapshot of FII trade-level data

This appendix presents the snapshot of FII trade-level data obtained from the National Securities Depository Limited (NSDL). The variable *FII* denotes the unique FII's registration number, though the original identification number is masked. *SCRIP_NAME* and *ISIN* denote the firm's name and its corresponding ISIN number. *TR_DATE* denotes the transaction date. *TR_TYPE(*)* represents the type of transaction: 1 for purchase of a security and 4 for sale of a security. *RATE* and *QUANTITY* denote the price of the security and quantity of securities transacted. *VALUE (in Rs)* denotes the total value (*RATE*QUANTITY*) of the transaction. Some of the other columns in the dataset that are not relevant are not included in the snapshot.

No.	FII	SCRIP_NAME	ISIN	TR_DATE	TR_TYPE(*)	RATE	QUANTITY	VALUE (in Rs)
23143	F5944222838201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	964	700	674,659
23167	F5944222838201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	979	2,000	1,957,667
23451	F5956548257201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	970	5,000	4,850,569
23576	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	972	106,832	103,837,958
23612	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	971	71,514	69,458,144
23614	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	973	21,168	20,595,710
23616	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	970	17,839	17,309,672
23725	F4878055966201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	969	46,216	44,795,362
23794	F5988662218201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	969	2,249	2,179,868
24170	F1090166694201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	971	102,745	99,743,973
24608	F9017309300201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	975	2,482	2,419,950
24992	F7982076945201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	968	31,546	30,551,670
25081	F7982076945201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	974	6,025	5,866,964
25084	F5944222838201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	966	700	676,140
27489	F4099792821201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	976	14,387	14,044,385
27520	F5951079511201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	969	23,694	22,967,736
27701	F4867416284201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	4	976	10,347	10,102,851
27881	F7557879625201301	TECH MAHINDRA LIMITED	INE669C01028	01/10/2013	1	962	4,919	4,729,711
28047	F983224094967201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	1,005	6,000	6,032,702
28299	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	4	994	500	496,878
28338	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	996	846	842,940
28342	F116150391092201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	1,000	954	953,766
28409	F4337525102201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	1,006	490	493,082
28607	F9718842060201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	1,009	10,000	10,086,841
29974	F4878055966201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	999	3,566	3,560,815
30144	F5944222838201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	4	1,002	250	250,517
31902	F7217250904201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	991	7,877	7,807,497
32248	F8707350444201301	TECH MAHINDRA LIMITED	INE669C01028	01/11/2013	1	1,000	153	152,992

Internet Appendix B: Information content of insider trades

Table B.1. Information content of insider trades: an alternative analysis

	Future one-month stock return		
	Pooled regression (1)	Fama-MacBeth regression (2)	Excluding extreme negative return months (3)
D (Opportunistic buy)	1.3122***	1.1710***	1.1872***
	(3.12)	(3.51)	(3.30)
D (Routine buy)	0.3624	1.0319	0.4736
	(0.46)	(1.22)	(0.72)
D (Opportunistic sell)	-0.2171	-0.4350	-0.1355
	(-0.83)	(-1.03)	(-0.22)
D (Routine sell)	0.3628	0.9653	0.3098
	(0.94)	(1.30)	(1.27)
Ln (Firm size)	-4.9285***	-0.5493***	-5.3518***
	(-5.03)	(-5.67)	(-5.55)
Ln (Book-market)	3.3702**	1.2259***	0.6091***
	(2.44)	(7.57)	(6.85)
Past month return	0.0470*	0.0125**	0.0110***
	(1.94)	(2.11)	(6.76)
Past year return	0.0051	0.0031	0.0004
	(0.50)	(0.74)	(0.22)
Firm fixed effects	Yes	No	Yes
Time (month) fixed effects	Yes	No	No
Adjusted/Average R^2	0.0501	0.3120	0.026
# of firms	880	880	880
# of observations	84,480	84,480	67,963

This table replicates the analysis of Cohen, Malloy, and Pomorski (2012) in the context of an emerging market. Model (1) reports the pooled regression (with firm and time (month) fixed effects), Model (2) reports the Fama-MacBeth (1973) regression of returns on the indicator of opportunistic and routine trades in the prior month, and Model (3) reports main regression results from Table 2 excluding months where firm experience extreme negative stock return (<-10%), over the 2007-2014 sample period. The dependent variable is the one-month future stock return. D (Opportunistic buy) and D (Routine buy) is a binary variable that takes the value of 1 if there were any buys on a given firm in the prior month by an opportunistic routine insider respectively. D (Opportunistic sell) and D (Routine sell) are defined similarly for insider sales. Ln (Firm size) and Ln (Book-market) are the natural log of the market capitalization and book-to-market ratio in the prior month. The past month (year) return is the return of the given firm over the prior month (year, excluding the prior month (*t*-2, *t*-12)). Standard errors are corrected for clustering at the firm and time level in Model (1). *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Internet Appendix C: Information content of insider trades: Ali and Hirshleifer (2017) measure

In this section, we use the Ali and Hirshleifer (2017) identification strategy to classify the insider trades. First, we calculate the profitability of each pre-quarterly earnings announcement (QEA) trade as the average market-adjusted return in the five-day window surrounding the QEA date.[33] We use return in the MSCI India index as a return on the market. The pre-QEA period is the 21-trading day period ending two trading days prior to the QEA date. Next, we calculate the average profitability of insiders' past pre-QEA trades for each insider, for each year, as:

$$Average\ profit = (\sum Profit_{(buy)} - \sum Profit_{(sell)})/(B + S) \quad \text{(IA.1)}$$

where B and S are the total numbers of buy and sell pre-QEA trades respectively, and *Profit* is the average profitability of *buy* and *sell* trades of insiders. At the beginning of each year, the insiders are ranked into quintiles based upon *Average profit.* Panel A of Table C.2 shows the summary statistics that provide the insiders' characteristics. We identify around 42% of the insiders from the insider universe who made at least one pre-QEA trade. Almost half of the buy and sell trades are made by these insiders. 72% of the firms in the entire universe have at least one ranked insider. Ali and Hirshleifer's (2017) measure identifies a larger number of insiders, insider trades and firms compared to Cohen, Malloy, and Pomorski's (2012) measure, as the insider is reclassified every year based on their past pre-QEA profitability. The profitability of Quintile 5 insiders' past pre-QEA trades is higher compared to other insiders as they earn on average 9.4% more than the market during the five-day QEA window. The trades by Quantile 5 insiders are identified as opportunistic trades. These results are consistent with Ali and Hirshleifer (2017).

In Panel B of Table C.2, we examine the information content of opportunistic insiders (Quintile 5). Similarly to Table B.1 of the Internet Appendix, we perform a multivariate analysis where the main dependent variable is future one-month stock returns. We run a pooled regression

[33] The QEA dates are collected from the Prowess database which provides details of all the board meetings, such as meeting dates and purpose. We identify the board meeting dates where "Purpose (abbreviated)" is listed as "QTR" denoting quarterly results announcements. We focus on the latest QEA dates if the difference in the two subsequent QEA dates is less than a month (for example: revised QEA announcements).

with standard errors clustered at the time and firm-level and include time (month) and firm fixed effects in Model (1), and Fama-MacBeth (1973) regressions in Model (2).

Our main variables of interest are D (Quintile 5 buy), D (Quintile 5 sell), D(Other buy) and D(Other sell). D (Quintile buy) is a binary variable that takes the value of 1 if there were any Quintile 5 buys on a given firm in the prior month and 0 otherwise. D (Other buy) is a binary variable that takes the value of 1 if there were any Quintile 1-4 buys on a given firm in the prior month and 0 otherwise. The definition of D (Quintile 5 sell) and D (Other sell) is similar. The control variables are similar to Table 4 of the main text. Our results are qualitatively similar to the results reported in Table 4 of the main text and Table B.1 of the Internet Appendix.

Table C.2. Information content: Ali and Hirshleifer (2017) measure

Panel A: Summary statistics for alternative opportunistic trades

Rank (Quintile)	Number of unique insiders	Number of unique firms	Number of buys	Number of sells	Average pre-QEA profitability	
					Mean	Median
1	1,442	834	3,520	2,189	-1.77%	-1.42%
2	1,413	782	3,236	3,094	-0.39%	-0.35%
3	1,340	780	5,663	2,795	0.03%	0.01%
4	1,428	810	4,635	2,902	0.49%	0.34%
5	1,424	839	3,940	2,058	1.90%	1.48%
Insider universe	14,003	2,542	41,582	25,679		
Ranked universe	5,827	1,834	20,994	13,038		
Ranked/Insider universe	0.42	0.72	0.50	0.51		

Panel B: Information content of alternative opportunistic trades

	Future one-month stock return		
	Pooled regression (1)	FM Regression (2)	Excluding extreme negative return months (3)
Quintile 5 buy	1.5248***	1.7440***	1.4237***
	(7.51)	(4.47)	(6.12)
Quintile 5 sell	-0.4174*	-0.9674*	-0.4145
	(-1.75)	(-1.79)	(-0.36)
Other buy	0.8706	0.6472	0.9285
	(1.62)	(1.20)	(1.59)
Other sell	0.1462	0.2231	0.1856
	(0.70)	(0.58)	(0.47)
Ln (Firm size)	-5.5909***	-1.0033***	-5.4964***
	(-7.67)	(-7.08)	(-5.99)
Ln (Book-market)	3.5811***	1.5522***	2.9177***
	(5.07)	(9.99)	(7.11)
Past month return	0.0325	0.0244***	0.0025
	(0.79)	(2.79)	(0.60)
Past year return	-0.0036	0.0071**	0.0065***
	(-0.40)	(2.54)	(3.74)
Time fixed effects	Yes	No	Yes
Firm fixed effects	Yes	No	Yes
Adjusted/Average R^2	0.0602	0.1443	0.1180
# of firms	1,834	1,834	1,834
# of observations	266,793	266,793	195,904

This table reports the summary statistics and analysis of the mimicking hypothesis using an alternative measure of opportunistic trades. We use Ali and Hirshleifer's (2017) identification strategy to classify the opportunistic trades. First, we calculate the profitability of each pre-QEA trade as the average market-adjusted return in the five-day window surrounding the QEA date. The pre-QEA period is the 21-trading day period ending two trading days prior to the QEA date. Next, we calculate the average profitability of insiders' past pre-QEA trades for each insider, for each year, as $Average\ profit = (\sum Profit_{(buy)} - \sum Profit_{(sell)})/(B+S)$ where B and S are the total numbers of buy and sell pre-QEA trades respectively, *Profit* is the average profitability of *buy* and *sell* trades of insiders. At the beginning of each year, the insiders are ranked into quintiles based upon *Average profit*. Panel A reports the insider level characteristics. Panel B presents the regression analysis using alternative identification of opportunistic trades. Model (1) reports the pooled regression (with firm and time (month) fixed effects), Model (2) reports the Fama-MacBeth (1973) regression of returns on the indicator of opportunistic and routine insider trades in the prior month and Model (3) reports the pooled regression excluding months with extreme negative returns (<-10%), over the 2007-2014 sample period. The dependent variable is the one-month future stock return. D(Quintile buy) is a binary variable that takes the value of 1 if there were any Quintile 5 buys on a given firm in the prior month and 0 otherwise. D(Other buy) is a binary variable that takes the value of 1 if there were any Quintile 1-4 buys on a given firm in the prior month and 0 otherwise. The definition of D(Quintile 5 sell) and D(Other sell) is similar. Ln (Firm size) and Ln (Book-market) are natural logs of the market capitalization and book-to-market ratio in the prior month end. Past month (year) return is the return of the given firm over the prior month (year, excluding the prior month (*t*-2, *t*-12)). Standard errors are corrected for clustering at the firm and time level in Model (1) and (3). *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Internet Appendix D. Information content of insider trades: an event study

In this section, we compute the CARs by using the market model for a period of 41 days centered on the reported day of opportunistic and routine insider trades.[34] The market return is proxied by the MSCI India Index.[35] The estimation period for the market model is from -200 to -21 days prior to the disclosure of the opportunistic and routine insider trades. To test the null hypothesis that the CARs are equal to zero for a sample of *N* securities, we use two parametric test statistics: *t-test B*, based on Boehmer, Masumeci, and Poulsen (1991) and *t-test K,* based on Kolari and Pynnönen (2010).

Table D.3 reports the results of the market reaction to opportunistic and routine trades. The table also reports the market reaction based on the intensity of these trades. For the classification of insider trading intensity, we sort entire samples for each category of insider trades into terciles and define the top 33rd percentile as the *Large* insider trading intensity, bottom 33rd percentile as the *Small* insider trading intensity and the remainder as *Medium*.

[Insert Table D.3 about here]

The results in Table D.3 provide evidence that CARs of opportunistic and routine insider buy (sell) trades are positive (negative). For overall Opportunistic buy trades, the 5-day CAR based on the reported day from the market model is 0.506%, which increases to 1.308% for the 20-day period and is significant at 1% regardless of the test statistics used. For overall Routine buy trades, the 5-day and 20-day CARs based on the reported day from the market model are 0.347% and 0.651% respectively and are significant at 1%. The CAR is positive but not significant over the 20 days prior to the reported date of Opportunistic and Routine Buy. This suggests that insiders are able to time their purchases. The results are in line with Cohen, Maloy and Pomorski (2012), Tirapat and Visaltanachoti (2013), Kraft, Lee and Lopatta (2014) and Ali and Hirshleifer (2017).

[34] We also use the Market Adjusted Return model to calculate the CARs and find similar results.
[35] The MSCI India Index measures the performance of large and medium cap segments of the Indian market, and it covers approximately 85% of the Indian equity universe.

Similarly, Table D.3 shows that the market reacts negatively to the announcement of both Opportunistic and Routine sell. The CARs for Opportunistic sell and Routine sell measured over the reported day and after the 5-day (20-day) period are -0.378% (-0.749%) and -0.319% (-0.039%) respectively and are all significant at 1%. The negative CARs follow a period of significant positive abnormal returns of about 1.678% for Opportunistic sell and 2.122% for Routine sell over the 20 days. As with buy trades, insiders seem to be able to time their sales very well. We conclude that both buy and sell trades are informative and can be interpreted as a signal for positive and negative news respectively. We find that the absolute market reaction to insider purchases (both opportunistic and routine) is higher than that of sales (both opportunistic and routine). The results are in line with Lakonishok and Lee (2001) and Fidrmuc, Goergen, and Renneboog (2006).

Next, we calculate the difference in abnormal return between the Opportunistic buy and Routine buy as well as between the Opportunistic sell and Routine sell. We find that the CARs for Opportunistic buy are higher than the Routine buy and there is a significant difference in CARs between these two trades. For example, the difference in CARs for the 20-day period after the reported day is 0.656% and it is significant at 1%. However, there is no significant difference in CARs between Opportunistic and Routine sell up to the 10-day period after the reported date, though the difference is weakly significant for the 20-day period. The reason for this pattern may be that markets attach less informational content to sales because some of the sales may be made due to insider's liquidity needs rather than bad news. We also conduct a similar analysis for large, medium and small insider sales.[36] Overall, our results remain qualitatively similar.

[36] We find a higher market reaction to larger insider trades compared to the smaller insider trades. Furthermore, the CARs for all Opportunistic buy (Routine buy) are on average 70% (87%) of that of large Opportunistic buy (Routine buy), while the CARs for all Opportunistic Sell (Routine Sell) are on average 54% (29%) of that of large Opportunistic sell (Routine sell).

Table D.3: Market reaction to routine and opportunistic insider trades

	Overall				Insiders trading intensity											
					Large				Medium				Small			
	(-20,-1)	**(1,5)**	**(1,10)**	**(1,20)**	**(-20,-1)**	**(1,5)**	**(1,10)**	**(1,20)**	**(-20,-1)**	**(1,5)**	**(1,10)**	**(1,20)**	**(-20,-1)**	**(1,5)**	**(1,10)**	**(1,20)**
Opportunistic buy (1)	0.428	0.506	0.735	1.308	1.109	0.804	1.329	1.444	0.533	0.662	1.084	1.602	-0.931	0.509	0.559	1.139
t-stat B	0.30	5.24***	5.03***	5.67***	1.2	5.55**	6.26**	4.99***	0.52	3.63***	4.02***	4.19***	-4.77***	2.77***	3.13***	5.41***
t-stat K	0.27	4.64***	4.36***	4.84***	1.85*	5.22**	5.97*	4.19***	0.46	3.04***	3.28***	3.43***	-4.01***	2.32**	2.63***	4.41***
Routine buy (2)	0.404	0.347	0.409	0.651	1.114	0.347	0.478	0.877	0.881	0.361	0.762	-0.080	-1.720	-0.149	0.092	0.890
t-stat B	1.27	2.18**	3.29***	2.67***	0.66	2.83***	2.70***	3.10***	1.52	1.16	1.75*	-0.62	-3.44***	-0.29	0.15	1.20
t-stat K	1.14	1.97*	2.98***	2.41**	0.59	2.52**	2.29**	2.75***	1.32	1.00	1.51	-0.54	-3.16***	-0.27	0.14	1.10
Diff (1-2)	0.024	**0.159**	**0.326**	**0.656**	0.494	**0.457**	**0.851**	**0.566**	-0.347	**0.301**	**0.321**	**1.683**	0.789	**0.658**	**0.467**	**0.249**
t-test	*0.90*	***2.02*****	***2.11*****	***2.86*****	*0.71*	***2.41*****	***3.86*****	***2.00*****	*-0.58*	***2.01*****	***2.77*****	***3.75*****	*1.46*	***2.35*****	***2.89*****	***1.86****
Opportunistic sell (3)	1.678	-0.378	-0.454	-0.749	-0.499	-0.603	-1.169	-1.251	3.484	-0.222	-0.136	-0.617	1.963	-0.181	-0.096	-0.402
t-stat B	6.59***	-3.82***	-3.80***	-4.59***	-1.68*	-3.16***	-3.59***	-3.37***	9.09***	-2.04**	-1.62	-2.96***	8.58***	-1.06	-0.59	-2.47***
t-stat K	5.84***	-3.38***	-3.36***	-4.07***	-1.34	-2.51**	-2.85***	-2.68***	7.68***	-1.72*	-1.37	-2.50**	7.77***	-0.96	-0.53	-2.33***
Routine sell (4)	2.122	-0.319	-0.215	-0.039	3.096	-0.769	-0.645	-0.309	1.809	-0.178	-0.185	-0.159	1.462	-0.143	0.188	0.350
t- stat B	7.43***	-3.40***	-2.05**	-1.97*	4.93***	-3.41***	-2.52**	-2.49**	3.62***	-1.09	-1.22	-1.33	4.24***	-1.37	0.20	0.40
t-stat K	7.17***	-3.28***	-1.98**	-1.90*	4.24***	-2.93***	-2.17**	-2.14**	3.15***	-0.95	-1.07	-1.16	3.99***	-1.29	0.19	0.38
Diff (3-4)	0.445	-0.059	-0.240	**-0.711**	-3.595	0.166	-0.524	**-0.942**	1.675	-0.044	0.049	**-0.458**	0.501	-0.038	-0.284	**-0.752**
t-test	1.07	-0.34	-0.96	**-1.87***	-3.47***	0.40	-0.84	**-1.96****	2.81***	-0.17	0.14	**-1.93***	1.37	-0.21	-0.79	**-2.20****

This table reports the CARs for opportunistic trades (buy and sell) and routine trades (buy and sell) around the reported dates of such trades based on all insiders' trades and on the intensity of insiders' trading using the market model. The MSCI India Index return is used as a proxy for the market return. The estimation period is from -200 to -21 days prior to the disclosure of insiders' trading. We analyze CARs for different event periods ranging from 20 days before the disclosure of insiders' trades and five, 10 and 20 days after the disclosure of insiders' trades. See the notes to Table 1 for the definitions of opportunistic and routine trades. For the classification of insiders' trading intensity, we sort the entire sample for each category of insiders' trades into terciles and define the top 33rd percentile as the *Large* insiders' trading intensity, bottom 33rd percentile as the *Small* insiders' trading intensity and rest as *Medium. t-test B* and *t-test K* denote the standardized cross-sectional test statistics proposed by Boehmer, Masumeci, Poulsen (1991) and Kolari and Pynnönen (2010) respectively. *t-test* is the test statistics for the difference in CARs of opportunistic and routine trades. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Internet Appendix E: Mimicking hypothesis using the Ali and Hirshleifer (2017) measure

Table E.4: Mimicking hypothesis: Ali and Hirshleifer (2017) measure

	(1-15)	(1-20)	(1-30)
	(1)	(2)	(3)
Quantile 5 buy	0.0055**	0.0061***	0.0058***
	(2.26)	(2.75)	(3.01)
Quantile 5 sell	-0.0001	-0.0002	-0.0003
	(-0.05)	(-0.11)	(-0.23)
Other buy	-0.0009	-0.0004	-0.0010
	(-0.86)	(-0.40)	(-0.89)
Other sell	-0.0002	-0.0004	-0.0003
	(-0.21)	(-0.51)	(-0.38)
Stock return	0.3269***	0.3198***	0.3014***
	(8.57)	(8.62)	(7.71)
Ln (Firm size)	0.0039	0.0046	0.0001
	(0.66)	(0.83)	(0.02)
Ln (Book-market)	-0.0153**	-0.0138**	-0.0157***
	(-2.31)	(-2.14)	(-2.64)
Turnover ratio	0.6852**	0.7236***	0.8185***
	(2.32)	(3.30)	(2.78)
Stock volatility	-0.0922	-0.0795	-0.1342
	(-0.49)	(-0.46)	(-0.84)
D (Announcement)	0.0014	0.0019	0.0029
	(0.58)	(0.87)	(1.34)
Ln (1+Number of analysts)	0.0022	0.0016	0.0035
	(0.71)	(0.53)	(1.08)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R^2	0.1690	0.1593	0.1407
# of firms	768	787	812
# of observations	125,800	162,383	246,866

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII after the disclosure of insiders' trades for different periods (15, 20 and 30 days after the disclosure of insiders' trading) and the insiders' trades over the sample period 2007-2014. NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t.* The main independent variables are Quintile 5 buy, Quintile 5 sell, Other buy and Other sell. Quintile 5 buy (Quintile 5 sell) is the number of shares bought (sold) by insiders ranked in Quintile 5 scaled by the previous day's number of outstanding shares. Other buy (sell) is the number of shares bought (sold) by insiders ranked in Quintiles 1 to 4 scaled by the previous day's number of outstanding shares. The control variables are similar to those in Table 4 and defined in the notes to Table 1 of the main text. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Internet Appendix F: Robustness test

Table F.5: Using past five years' trading history of insiders

Panel A: Mimicking hypothesis

				Large insiders' trades		
	(1-15)	(1-20)	(1-30)	(1-15)	(1-20)	(1-30)
	(1)	(2)	(3)	(4)	(5)	(6)
Opportunistic buy	0.0121**	0.0155***	0.0148***	0.0151***	0.0159***	0.0151***
	(1.96)	(3.01)	(3.22)	(3.56)	(3.89)	(4.01)
Opportunistic sell	0.0006	-0.0005	-0.0011	-0.0015	-0.0021	-0.0033
	(0.45)	(-0.41)	(-1.19)	(-0.12)	(-0.30)	(-0.60)
Routine buy	-0.0058	-0.0098	-0.0101	-0.0008	-0.0004	-0.0006
	(-0.29)	(-0.65)	(-0.91)	(-0.71)	(-0.69)	(-0.85)
Routine sell	0.0009	0.0008	0.0008	-0.0003	-0.0002	-0.0004
	(1.11)	(1.12)	(1.45)	(-0.31)	(-0.28)	(-0.59)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.1601	0.1422	0.1120	0.1602	0.1471	0.1143
Number of firms	233	237	244	182	201	216
Number of observations	35,107	45,377	69,189	10,486	13,378	19,376

Panel B: Calendar-time portfolio analysis

Portfolio	Average raw return (%)	Average market adjusted (%)	Intercept			Coefficient for the four-factors model				R^2
			CAPM	Three-factors	Four-factors	$R_{mt} - R_{ft}$	SMB_t	HML_t	WML_t	
Panel A. Buy Trades										
Opportunistic buy (OB)	2.34***	0.24***	2.08***	2.15***	2.14***	0.32	0.11	0.03	-0.45**	0.21
	(4.72)	(5.47)	(4.49)	(4.32)	(4.40)	(1.06)	(0.25)	(0.10)	(-2.17)	
Routine buy (RB)	1.03**	1.19*	1.06	1.26	1.19	0.68	1.00	1.06	-0.46	0.41
	(2.28)	(1.92)	(1.16)	(1.25)	(0.91)	(0.48)	(1.39)	(1.34)	(-1.52)	
Long OB – Long RB	1.31***	1.05***	1.02***	0.89***	0.95***	-0.36	-0.89	-1.03	0.01	0.39
	(3.17)	(2.93)	(3.12)	(3.10)	(3.30)	(-0.25)	(-2.00)	(1.30)	(1.27)	
Opportunistic sell (OS)	-0.53	-0.10	-0.08	-0.18	-0.16	0.03	0.14	-0.02	-0.01	0.12
	(-1.16)	(-0.29)	(-0.19)	(-0.43)	(-0.36)	(0.27)	(1.62)	(-0.22)	(-0.09)	
Routine sell (RS)	-0.09	-0.04	-0.03	-0.02	-0.06	-0.15	-0.01	0.02	-0.15*	0.09
	(-1.06)	(-0.77)	(-0.05)	(-0.03)	(-0.59)	(-1.09)	(-0.04)	(0.20)	(-1.74)	
Short OS – Short RS	-0.44	-0.06	-0.03	-0.16	-0.10	0.18	0.15	-0.04	0.14	0.08
	(0.09)	(0.84)	(-0.16)	(-0.30)	(-0.68)	(1.01)	(0.91)	(-0.30)	(1.01)	

Long OB + Short OS	2.87***	2.34***	2.16***	2.33***	2.30***	0.29	-0.03	0.05	-0.44*	0.28
	(3.47)	(3.54)	(3.28)	(3.20)	(3.28)	(0.90)	(-0.06)	(0.15)	(-1.87)	
Long RB + Short RS	1.12	2.34	1.09	1.28	1.25	0.83	1.01	1.04	-0.31	0.41
	(0.44)	(0.07)	(-0.17)	(-0.26)	(0.76)	(0.60)	(2.41)	(-1.38)	(-1.45)	

Panel C: Abnormal return of mimickers (in %)

		Opportunistic buy				Opportunistic sell			
		(-20, -1)	(1, 5)	(1, 10)	(1, 20)	(-20, -1)	(1, 5)	(1, 10)	(1, 20)
Treatment (1)		0.781	0.929	1.226	2.010	2.429	-0.347	-0.327	-0.263
	t-test B	2.50**	5.08***	5.97***	7.44***	5.09***	-1.93*	-2.74***	-3.33***
	t-test K	2.37**	4.82***	5.65***	7.05***	4.23***	-1.61	-2.38**	-2.89***
Control (2)		0.172	0.258	0.359	1.123	1.838	0.191	0.387	0.538
	t-test B	0.11	0.55	2.44**	2.60**	3.46***	1.83*	1.18	1.48
	t-test K	0.10	0.52	2.29**	2.43**	3.01***	1.59	0.98	1.23
Diff (1-2)		0.609	**0.671**	**0.867**	**0.887**	0.591	**-0.538**	**-0.714**	**-0.801**
	t-test	1.46	**3.00*** **	**2.73*** **	**3.59*** **	1.02	**-1.90***	**-3.07*** **	**-3.11*** **

This table shows the result of the robustness test for the mimicking hypothesis in Panel A, calendar-time portfolio analysis in Panel B and CARs for treatment and control firms for opportunistic buy and sell trades in Panel C using a stringent definition of opportunistic and routine traders. For the classification of insiders' trades, in this alternate setting, an insider must make at least one trade in each of the five preceding years. A routine trader is an insider who placed a trade in the same calendar month for at least five consecutive years. Otherwise, the trader is considered as an opportunistic. An insider will be classified as either routine or opportunistic at the beginning of each year and all subsequent trades after the classification are then classified as either routine buy (sell) or opportunistic buy (sell) trades. Panels A, B, and C replicate the analysis of Tables 4, 11 and 12 of the main text respectively using the stringent definition. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table F.6: Robustness tests: Portfolio pumping/window dressing and extreme stock return

	Excluding month-end observations			Excluding extreme negative return months
	(1, 15)	(1, 20)	(1, 30)	(1,30)
	(1)	(2)	(3)	(4)
Opportunistic buy	0.0043**	0.0076***	0.0080***	0.0064**
	(2.38)	(3.26)	(3.13)	(2.48)
Routine buy	0.0010	0.0009	0.0016	0.0004
	(0.22)	(0.21)	(0.48)	(0.16)
Opportunistic sell	-0.0065	-0.0050	-0.0036	-0.0053
	(-0.93)	(-0.95)	(-0.67)	(-1.32)
Routine sell	-0.0012	-0.0018	-0.0013	-0.0024
	(-0.77)	(-0.73)	(-0.73)	(-1.37)
Stock return	0.1481**	0.1756**	0.1927**	0.2099***
	(2.36)	(2.26)	(2.03)	(5.01)
Ln (Firm size)	0.0084	0.0097**	0.0115**	0.0098
	(1.47)	(2.01)	(2.24)	(1.41)
Ln (Book-market)	0.7442	2.0718*	2.8368**	0.0181*
	(0.51)	(1.76)	(2.54)	(1.80)
Turnover ratio	0.0181*	0.0185**	0.0161**	0.5048**
	(1.87)	(2.12)	(2.17)	(2.31)
Stock volatility	-0.7562**	-0.5893*	-0.4492	-0.8147**
	(-1.98)	(-1.69)	(-1.29)	(-2.49)
D (Announcement)	0.0066	0.0063	0.0020	0.0071
	(0.13)	(0.14)	(0.05)	(0.23)
Ln (1+Number of analysts)	0.0039	0.0058	0.0108**	0.0032
	(0.78)	(1.23)	(2.38)	(0.65)
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.1675	0.1578	0.1144	0.088
# of firms	416	431	451	396
# of observations	40,337	52,527	80,419	45,732

This table shows the result of regressions between Net Equity Trading (NET_{it}) by FII after the disclosure of insider trades and the opportunistic and routine trades in Models (1) – (3) for different windows excluding month-end observations and Model (4) excluding extreme negative stock return months (>-10%) over the sample period 2007-2014. NET_{it}, Opportunistic buy, Routine buy, Opportunistic sell and Routine sell are defined in the notes to Table 4. All the control variables are defined in the notes to Table 1. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

Table F.7: Change in insider trading regulation: difference-in-difference analysis

Panel A: Mean difference-in-differences in net equity trading by FII

	Pre- regulation (1)	Post-regulation (2)	Difference (2)-(1)	*t*-stat
Treatment	0.5984	-0.1854	-0.7838***	-7.76
Control	0.4794	0.2247	-0.2547**	-2.89
Difference (Pre)	0.1190			0.76
Difference (Post)		-0.4107		-4.85
Difference-in-differences			-0.5291***	-3.19

Panel B: Difference-in-differences regression

	Effective Date (1)	Announcement Date (2)
$D\left(Regulation_{May2015}\right) \times TRMT_i$	-0.5146**	
	(-2.89)	
$D\left(Regulation_{Jan2015}\right) \times TRMT_i$		-0.4665**
		(-2.69)
Stock return	0.2541***	0.2660***
	(6.72)	(6.91)
Ln (Firm size)	0.0049	0.0015
	(0.61)	(0.23)
Ln (Book-market)	-0.0150**	-0.0155***
	(-2.44)	(-2.79)
Turnover ratio	1.1271	1.3806
	(1.22)	(1.21)
Stock volatility	-0.1760	-0.3536*
	(-0.42)	(-1.91)
D (Announcement)	0.0043***	0.0014
	(2.69)	(0.86)
Ln (1+Number of analysts)	0.0107**	0.0057
	(2.06)	(1.12)
Firm fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Adjusted R^2	0.1013	0.1075
Number of firms	662	662
Number of observations	131,287	134,852

This table reports the DiD test examining how opportunistic insider trades affect the Net Equity Trading (NET_{it}) of FII NET_{it} is defined as the number of shares traded by all FII scaled by the previous day's number of shares outstanding of firm *i* in day *t* (reported in pbs units). The treatment group is defined as the firms where insiders trade whereas the control group is defined as the firms where insiders do not trade. We use PSM with the nearest neighborhood of 0.01 caliper using various firm-level characteristics to identify matched control groups. Panel A provides the DiD test results for NET_{it} a year before and after the effective date (15th May 2015) of change in insider trading regulation. Panel B reports the regression estimates of NET_{it} of treatment and control firms surrounding the disclosure of opportunistic and routine insider trades. The dependent variable is NET_{it} by FII. $Regulation_{May2015}$ ($Regulation_{Jan2015}$) is a dummy variable that take value 1 for days in a year after the effective date (announcement date) of change in insider trading regulation and 0 for days in a year before. $TRMT_i$ is a dummy variable that takes a value of 1 for treatment firms and 0 for control firms. All the control variables are defined in the notes to Table 1 in the main text. For consistency, the coefficients of control variables are divided by 100. We control for time and firm fixed effects. Standard errors are corrected for clustering at the firm and time level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% significance level respectively.

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