Insider Trading: Does Being a Neighbor of the SEC Matter?

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Abstract

Using a perception-based crime deterrence approach, we present evidence that corporate insiders located closer to the Securities and Exchange Commission (SEC) regional offices trade less frequently on their own company's stocks, while earn higher abnormal returns from such insider transactions. These results are robust to several additional tests. Our further analysis indicates that such differences in trading profitability are mitigated during the periods of a high level of legal jeopardy such as the periods around earnings announcements and mergers and acquisitions. These findings are consistent with the view that SEC oversight has an impact on insiders' trading behavior by influencing their perceptions of sanctions risk.

Keywords: Perception deterrence; Insider trading; SEC organizational structure; Geographic proximity

I. Introduction

The Securities Exchanges Act of 1934 is the primary federal securities law that regulates, among other things, insider trading. The provisions of the Act are motivated by the concern that insider trading erodes public confidence in capital markets and raises the cost of capital (Carlton & Fischel 1983). These federal regulations entail not only the enactment of insider trading legislation (including statutory and case laws) but also strong enforcement procedures (Bhattacharya & Daouk 2002). Recent high-profile security fraud cases (e.g., the biggest Ponzi scheme in history perpetrated by Bernard Madoff and the indictment of the billionaire Galleon hedge fund manager, Raj Rajaratnam, for illegal insider trading) raise concerns about the effectiveness of the Securities and Exchange Commission (SEC) enforcement of securities laws in general, and the effectiveness of insider trading enforcement in particular. The efficacy of the SEC enforcement program on insider trading is thus of great interest to policymakers, academics and market participants. In this paper, we investigate the effect of SEC oversight by examining how the geographic proximity of insiders to the SEC (i.e., the closest regional office) influences the corporate insiders' trading behavior of their own company's stocks, after controlling for the firms' geographic proximity to the SEC and other firm-specific characteristics.[1]

Our study builds on a large body of literature on the effect of regulations on insider trading behavior, which often provides mixed findings. On the one hand, Jaffe (1974) examines insider trading activities following three important court decisions in case law related to insider trading in the 1960s, and fails to find any significant changes in the characteristics of insider trading before and after those decisions. Seyhun (1992) examines the effects of increases in the severity of sanctions against insider trading in the 1980s on corporate insiders, but finds no evidence of subsequent reductions in insider trading activities. On the other hand, other studies provide evidence that insider trading regulations affect insiders' decisions to trade. For example, Garfinkel (1997) presents evidence that the Insider Trading and Securities Fraud Enforcement Act of 1988 deters insider trading. Bettis et al. (2000) find that corporate

[1] It is important to note that we use the insiders', NOT the firms', geographic proximity to SEC offices, as our main variable of interest.

self-regulating policies successfully suppress trading by insiders. Jagolinzer (2009) examines the effect of the SEC regulation that grants affirmative defense to trading by corporate insiders under certain circumstances (i.e., SEC Rule 10b5-1), and finds that corporate insiders strategically arrange their trades to benefit themselves following the introduction of this rule. We extend and supplement this literature by investigating the relation between the characteristics of corporate insiders' trading behavior and the geographic proximity of insiders to the SEC.

We exploit one aspect of the SEC's organizational structure to operationalize SEC oversight. Specifically, to enforce the capital market regulations including the insider trading rules, the SEC adopted a strategic organizational structure. One feature of this structure is to establish 11 SEC regional offices across the country. It is noteworthy that one of the objectives of these SEC regional offices is to prevent corporate insiders from taking advantage of the information asymmetry between insiders and outside investors (Shapiro 1984). The regional offices are not only an integral part of the SEC's enforcement, but also in many cases proactive initiators of investigations and inquiries into potential violations of insider trading rules. Therefore, the SEC regional offices play an important role in monitoring insider trading activities (Scannell 2008). Accordingly, we use corporate insiders' geographic proximity to SEC regional offices to capture the dynamics of the SEC's insider trading enforcement program.

The perspective we employ in the paper is on the basis of perception-based crime deterrence as studied in the law and economics literature (see Nagin 1998 for a review). According to this literature, the *perceived* probability of being punished for committing a crime, rather than the *actual* probability of punishment, is a key element in an individual's decision on whether or not to engage in a criminal activity. Studies in this field generally find that criminal participation is lower among people who have a higher perception of sanctions risk and the severity of such sanctions (Bachman et al. 1992; Paternoster & Simpson 1996; Lochner 2007).[2] Sah (1991) argues that the perceived probability of being punished for

[2] Similar results have also been established in academic dishonesty studies. Further, in both streams of the literature, a number of studies conclude that the deterrence effect of the perceived probability of detection dominates that of the perceived severity of penalty (Nagin & Pogarsky 2003; Witte 1980).

committing a crime is inherently uncertain and may vary across individuals. Similarly, Glaeser et al. (1996) show that the perceived probability of sanctions is subjective and varies across individuals. Applying their arguments to the setting of insider trading, we argue that corporate insiders have different perceptions of being targeted by the SEC for insider trading and that such differences in perceptions lead to different insider trading behavior.

Empirically, we use corporate insiders' geographic proximity to the nearest SEC regional office to capture their perceptions of SEC enforcement of insider trading regulations. This is based on the recent findings in the emerging literature that shows the effect of geographic proximity on a variety of social (mis)behavior (see Pirinsky & Wang 2010 for an early review of the finance literature, and more recently, DeFond et al. 2011, Kedia & Rajgopal 2011, Parsons et al. 2014 among others). We conjecture that geographic proximity facilitates social, civic, and/or business interactions between corporate insiders and SEC staff working at the nearby regional office. Therefore, corporate insiders in closer proximity to the SEC regional offices are more likely to have first-hand experience with the SEC. These insiders are also more likely to know and learn from people with such an experience. This experience raises the level of awareness of the policing function of the SEC offices and the costs of committing a violation. Thus we posit that geographic proximity to the SEC reflects heightened awareness of the insider trading regulations and SEC enforcement, which in turn leads to a higher perception of SEC's sanctions.[3]

Our analysis is based on a sample of open market transactions by corporate insiders between January 1996 and June 2007. We restrict our sample to non-executive board members, because non-executive insiders arguably have similar levels of access to private information and no impact on firms'

[3] The literature from two other research streams also lends support to this line of thinking. According to the "broken windows" theory (Wilson & Kelling 1982), individuals are more likely to engage in crime in neighborhoods that exhibit decay (e.g., broken windows), because they believe that they are less likely to be arrested. Numerous studies of academic dishonesty also provide strong evidence that heightened awareness, as a result of (1) clear communication between the institution and students about the existence of policies concerning proper conduct and the consequences of breaching them and (2) the highlighted presence of policing measures, such as a proctor sitting in the test room, effectively deters cheating behavior (e.g., Jendrek 1992; McCabe et al. 1999).

strategic information disclosure.[4] We predict and find that when corporate insiders are located near SEC regional offices, they trade less frequently in the shares of their own companies, suggesting that insiders curtail their trading activities when they have higher perceptions of being sanctioned by the SEC. We also find that the transactions of corporate insiders who are close to the SEC earn relatively higher abnormal returns than corporate insiders located far from the SEC. These results suggest that the deterrent effect of the SEC enforcement is salient for the cases of insiders' private information being less profitable while such a deterrent effect becomes less salient when insiders' private information is more profitable. Our findings are consistent with Witte (1980) who documents that the law deterrence has a significant effect on the offenders who commit non-serious monetary crimes/misconduct, but such deterrence does not seem to work for serious offenses. Our results are robust to controlling for the distance of the firm to the SEC and other firm characteristics. To gauge the economic magnitude of the effect of geographic proximity to the SEC on insider trading, we perform a portfolio analysis using the calendar time four-factor pricing model (Fama & French 1993; Carhart 1997). Our analysis shows that after controlling for the common risk factors, the stock returns to the portfolio based on insider trading information are systematically associated with geographic proximity to the SEC.

We conduct several tests to differentiate our position from the alternative explanations that geographic proximity may be an indication of the location-specific information and/or cultural considerations. First, we examine the insider trading profitability around two major types of corporate events (mergers and acquisitions, and earnings announcements) that are subject to more stringent SEC scrutiny (Seyhun 1992). Our perception-based explanation implies that the differential trading profitability should be mitigated in the time windows of these events due to a high level of legal jeopardy, while the information argument makes no such prediction. We find that indeed the differential trading profitability is mitigated around merges and acquisitions, and earnings announcements, consistent with

[4] By its nature, it is impossible to directly observe *a priori* all private information accessible to corporate insiders, so one must draw inferences about the impact of any given private information from ex post realizations of returns following insider trading (Jaffe 1974). We try to isolate the insider trading return from returns caused by firms' strategic disclosure of relevant information.

the view that corporate insiders selectively trade on more profitable private information in response to the higher perceptions of sanctions risk stemming from their geographic proximity to the SEC, but only do so when the level of legal jeopardy is low. Second, to further illustrate that our findings are robust to location-specific factors, we conduct two additional analyses. In one analysis we replicate the main regressions by using only the insider trades by those insiders from urban areas. This analysis helps to rule out the effect of urban-versus-rural differences on our results. In the other analysis, we exclude from our sample those insiders located in the three major metropolitan areas of New York, Los Angeles and San Francisco, which are featured by the multi-cultural centers, international business models and the clustering of certain industries. Our inferences remain unchanged for both analyses.

Lastly, we conduct a change analysis to corroborate our main finding. We identify a small sample of insiders who changed their residential addresses, either moving closer to or further away from the SEC, in our sample period. The (untabulated) results show that when insiders move closer to the SEC, their trades are significantly more profitable than their previous trades made before the move, consistent with insiders developing higher perceived sanctions risk after the move, and thus trading on the private information which can bring higher returns to compensate for higher sanctions risk. Interestingly, our analysis shows no significant change in the trading profitability when insiders move further way from the SEC, implying that the high level of perceptions of sanctions risk will not fade away by moving away from the SEC offices.

This paper contributes to the literature in two ways. First, we demonstrate that SEC's routine enforcement program has a deterrent effect on the trading behaviors of corporate insiders. While there is a large body of research dedicated to investigating the effects of regulations on insider trading, little research has focused directly on the SEC's routine enforcement program of insider trading regulations (Shapiro 1984), even though intuitively such a program is one of the most relevant settings to evaluate the effectiveness of federal insider trading regulations. By exploiting a peculiar aspect of the SEC's organizational structure to operationalize SEC oversight, we intend to enhance our understanding of the efficacy of the SEC's routine enforcement program. Second, we identify a situational/institutional factor

(i.e., geographic proximity of corporate insiders to the SEC) that affects insider trading. In this regard, our paper adds to the emerging literature on the relation between geographic distance and social misconduct (e.gl, DeFond et al. 2011; Kedia & Rajgopal 2011; Parsons et al. 2014; and Giannetti & Wang 2015).

The ultimate objective of insider trading regulations is to prevent corporate insiders from taking advantage of the information asymmetry between insiders and outsiders (Seyhun 1992). Our findings suggest that to achieve this objective, it requires not only sound insider trading laws being in place, but also appropriate contextual factors being explicitly modeled. Specifically, insiders' trading behavior is significantly affected by the *ex ante* perceptions of enforcement, in addition to the actual enforcement. This notion is important because, from a public policy perspective, such situational/institutional factors should be considered when trying to optimize the perceived risk of being punished for those insiders committing illegal insider trading. Thus we attempt to shed light on the concern that though "the evidence for a substantial deterrent is much firmer, …, is not a sufficient condition for concluding that policy can deter crime. Unless the perceptions themselves are manipulable by policy, …" (Nagin 1998, 3-5).[5]

II. Hypothesis Development

A Perception-based Crime Deterrence Approach

The ultimate objective of insider trading regulation is to *deter* illegal insider trading activities. However, deterrence is ultimately a *perceptual* phenomenon (Nagin 1998). This observation naturally applies to the SEC's enforcement of insider trading regulations. The literature on crime deterrence supports the notion that the collective actions of the justice system have a substantial deterrent effect on criminal activity (Nagin 1998). One stream of this research focuses on the link between crime participation and *perceptions* of the probability and severity of sanctions, as opposed to *actual* arrest rates and penalties. It is argued that an individual's choice of whether or not to commit a crime is a function of

[5] As a caveat, we acknowledge that we use the geographic proximity to capture the strength of the insiders' perceptions of sanctions risk, but we do not mean to propose that the locations of firms or insiders should be near the SEC offices in order to better regulate insiders' trading behavior since it entails other constraints that are not modelled here.

his or her *perceived* probability of punishment. This literature finds that a higher *perceived* probability of punishment reduces crime propensity (Sah 1991; Lochner 2007). Following this stream of literature, we posit that a higher perception of SEC enforcement of insider trading regulations leads to a lower propensity to engage in insider trading activities.

We argue that the perception of sanctions for engaging in illegal insider trading activities is essentially subjective and varies across corporate insiders. As a starting point, an individual's perceived probability of getting caught can differ from the actual probability of being punished. This point is supported by those well-established findings in the perception-based law and economics literature on crime. For example, Lochner (2007) finds that while the perceived probability of arrest varies across ethnic groups, the official arrest rates do not vary across races (Tonry 1995). Numerous studies have found large variances in the perceived probability of punishment within societal groups.[6] In addition, significant differences in the distribution of perceived probability have been observed across various socioeconomic status categories (Richards & Tittle 1982). Finally, it is notoriously difficult to estimate the actual probability of punishment, even for expert researchers (e.g., O'Donnell et al.1976). Consequently, it is reasonable to posit that a layperson would have difficulty in gauging the actual probability of punishment. In summary, we argue that the perceived probability of SEC enforcement differs among corporate insiders, which, in turn, leads to differences in their propensity to engage in insider trading.

We use corporate insiders' geographic proximity to SEC regional offices to capture their perceptions of SEC enforcement. The intuition behind this measure can be described by the "broken windows" theory (Wilson & Kelling 1982), which suggests that individuals are more likely to engage in crime in neighborhoods exhibiting decay (e.g., broken windows), because the lack of visible law enforcement leads them to believe that they are less likely to be arrested. The essence of this theory is that

[6] For example, Bachman et al. (1992) find that among college male students, the perceived risk of formal sanctions for sexual offending is correlated with scenario conditions, for example, when the male did not injure the female or the couple had been dating.

social norms and/or signals affect individuals' behavior. An unattended broken window sets a norm that breaking windows and other such behaviors are to some extent tolerable and hence sends a signal that there is weak policing in the area, which leads to a low perceived probability of getting caught and, thus, encourages crime.

Geographic proximity, social influence, and (mis)behavior

Following the same line of argument, Glaeser et al. (1996) propose that social interactions among agents affect their tendency to break or comply with rules. Recent research on geographic proximity suggests that close proximity enables agents to form a well-defined physical and social "milieu" that facilitates information transfers, formation of beliefs, and the assessment of nonverbal cues (e.g., body language, facial expressions, and vocal tone) through their interpersonal connections (Bushee et al. 2011). In particular, such interpersonal connections facilitate the communication of sensitive and ambiguous information that cannot be formally documented but can be conveyed subtly through casual interactions. For instance, Parsons et al. (2014) investigate the causes and consequences of financial misconduct by firms. They find that a firm's tendency to engage in financial misconduct increases with the misconduct rates of neighboring firms. Their conclusion is that the propensity for financial misconduct may spread within a region via peer effects, or more specifically, through interpersonal interactions. In a similar vein, Giannetti & Wang (2015) study the impact of corporate fraud revelation on local general investors' stock market participation. They find that all investors decrease their holdings in fraudulent firms, and even those that did not hold stocks in the fraudulent firms decrease their equity holdings. They attribute this finding to investors' heightened awareness of such episodes through their personal interactions. The findings in Giannetti & Wang (2015) are extended to more sophisticated investors by Parsons et al. (2015) who provide empirical evidence that after the revelation of a firm's financial misconduct, financial institutions' willingness to supply capital to firms in close proximity of the fraudulent firm is significantly reduced.

The key argument lying behind these aforementioned findings is that strong interpersonal interactions within a local community can considerably alter agents' awareness and perceptions of the

causes and consequences of non-compliance of legal rules. This is the approach we are taking in this paper. We argue that corporate insiders are typically involved in a variety of social, civic, and business activities in their local communities. Such activities are likely to bring these corporate insiders into direct contacts with other business professionals (such as lawyers, bankers, and other corporate insiders), and SEC staff if they are close to an SEC regional office. Therefore, corporate insiders in closer proximity to SEC regional offices are more likely to have first-hand experience with SEC, including the conversations with SEC staff, knowledge about SEC decision criteria, and even the observation of SEC investigations. These corporate insiders with closer proximity to the SEC can also learn indirectly from local persons who have first-hand experience with SEC. Since an individual's perception is mostly influenced by his or her own experience and the experiences of people he or she is acquainted with (Sah 1991, and Lochner 2007), corporate insiders near the SEC are expected to have higher perceptions of insider trading deterrence.

In this regard, the most relevant study is Kedia & Rajgopal (2011) who investigate firms' propensity to restate their financial statements due to the violation of financial reporting rules. They show that firms located closer to the SEC are less likely to restate their financial statements. This finding suggests that regulation is most effective when it is local because proximity to the SEC provides managers access to soft information about current undocumented SEC policies through casual interactions. As a result, managers differ in their perceived probability of being targeted by the SEC and the associated cost thereof, and such a difference affects managers' decision to adopt aggressive accounting practices that increase the probability of a future restatement.[7] DeFond et al. (2011) extend this line of inquiry to the auditing domain. They predict and find that auditors located near the SEC have greater awareness of the SEC's investigative activities and the consequences of such activities. As a

[7] Another reason for such a finding is that severe resource constraints faced by the SEC in investigating potential miscreants make the SEC more likely to initiate investigations closer to its offices (Pitt & Shapiro 1990, Kedia & Rajgopal 2011, and DeFond et al. 2011). This also generates a higher deterrence effect.

result, these auditors are more likely to issue going concern audit opinions for the financial statements of financially distressed firms.[8]

Predictions on geographic proximity and insider trading

The above discussion leads to our conjecture that corporate insiders located near SEC regional offices have greater awareness of the presence of SEC enforcement and the costs of committing a violation, which heightens their perceptions of insider trading deterrence. However, some might argue that the more an insider learns about the SEC, the more this insider knows what the SEC is looking for and what the SEC tends to ignore. Armed with this knowledge, such an insider might be more likely to trade illegally, since he or she knows the tricks to avoid being caught. While we cannot rule out this possibility, we note that the SEC is especially tight-lipped about the technical details regarding their investigations, and understandably so (Shapiro 1984). In other words, in this paper, we take the view that while corporate insiders gain awareness of the SEC's enforcement activities when they are close to SEC regional offices, they are unlikely to learn details regarding the SEC's investigation technologies that they could use to circumvent the SEC's scrutiny of illegal insider trading activities. Another counter-argument is that the proximity to the SEC provides little additional information about the SEC's activities, given the plethora of news sources (radio, TV, newspapers, magazines, internet, etc.) that we have today. Corporate insiders are presumably educated individuals with easy access to these news sources. If this argument is true, we should not find any statistical association between the trading behavior of insiders and the

[8] There are a plethora of studies that examine the effect of geographic proximity on a variety of behavior of market participants including both general retailor investors and highly sophisticated participants such as analysts and firms. For example, Malloy (2005) documents that analysts located close to a firm have superior performance when they follow the firm due to their better access to management via personal connections. O'Brien & Tan (2014) find that analysts are more likely to cover local firms than non-local ones, and nearby non-underwriter analysts initiate coverage one to three weeks earlier than distant ones. Uysal et al. (2008) find that acquirer returns in local transactions (i.e., within close geographic proximity) are more than twice that in non-local transactions. Informational advantages arising from geographic proximity have also been documented in portfolio decisions (Coval & Moskowitz 2001, Ivkovich & Weisbenner 2005) and investment decisions of firms (Kedia et al. 2008). Pirinsky & Wang (2010) provide an earlier review of studies on geographical location and finance. A general theme of this line of research is that despite the advancement of modern communications, geographic proximity still plays a considerable role in affecting market participants' perception and behavior. The literature on broker-hosted investor conference and corporate site visits also suggests that physical presence generates more direct personal interactions that can generate useful information for decision making (e.g., Green et al 2014, and Cheng et al. 2014 and 2015).

geographic proximity of corporate insiders to SEC regional offices. In addition, the recent literature on the private information acquisition activities has already shown the usefulness of direct private interactions in generating new information such as analysts' field trips to the company's headquarters and the investors' participation in broker-hosted conferences (Cheng et al. 2015; Green et al. 2014). These prior studies suggest that the direct interactions still serve as an important information channel to mitigate information uncertainty.

Moreover, the literature on academic dishonesty also lends strong support to the above-mentioned argument. This line of research focuses on students' perceptions of the effectiveness of various cheating countermeasures (Hollinger & lanza-Kaduce 2009). Studies suggest that situational and institutional factors (or contextual factors) have a profound effect on students' cheating behavior (McCabe 1993). McCabe & Trevino (1993) find that while establishing policies regarding appropriate conduct, such as honor codes, can reduce the incidence of cheating, the existence of an honor code alone is not enough to deter cheating. Clearly conveying beliefs about the seriousness of dishonesty, communicating expectations regarding high standards of integrity, and encouraging students to be aware of, and abide by rules of proper conduct are not only necessary, but even more important than simply having an honor code in place (McCabe et al. 1999). An interesting observation is that having students discuss the consequences of cheating with each other can control cheating (Jendrek 1992). All of these findings highlight the importance of "awareness" in forming perceptions and deterring improper behavior.

Following Becker's (1968) approach, we expect that the uncertainty of being targeted by the SEC will make insiders choose to engage in insider trading only if the expected benefits exceed the expected costs. We incorporate insiders' perceptions of sanctions risk into the model in the following way: in deriving the expected costs of insider trades, we assume that insiders' perceived likelihood of getting caught comprises two components, one objective component, which is an increasing function of the profitability of their private information, and the other, a subjective component, which is a decreasing function of insiders' distance from the SEC for the perceptions of sanctions risk. We argue that as the distance to the SEC decreases, the opportunity set for insider trading becomes smaller because the

threshold to derive a net gain is higher. Therefore our first testable implication is that insiders closer to the SEC are less likely to engage in insider trades.

Hypothesis: Insiders' trading frequency is negatively correlated with their geographic proximity to the SEC offices.

The relation between geographic distance and the profitability of insider trades is, however, less straightforward. On the one hand, the formal surveillance and policing activities of the SEC impose risks on insider trades. On the other hand, with limited trading opportunities (i.e., reduced amount of private information which brings a high enough return to compensate for the higher risk of being sanctioned), insiders may be tempted to trade on the private information that gives them the biggest bang for their buck. There is a tradeoff between the profitability and risk, and the tradeoff could vary systematically across insiders in various proximities to the SEC. Thus whether the level of profitability is, on average, higher or lower for insiders closer to the SEC is an empirical question, and we let the data speak.

III. Sample Selection and Descriptive Characteristics

According to the Securities Exchange Act of 1934, corporate insiders are defined as officers, directors, and owners of 10% or more of any equity class of securities. While corporate insiders include officers, directors, and blockholders, we focus on non-executive board members in this study. The narrow focus of non-executive directors is due to the fact that corporate executives such as CEOs, not only possess private information, but also exert considerable impact on corporate activities, such as voluntary disclosures and mandatory accounting reports. These firm-level disclosures are potentially strategically related to executives' trading behavior and at the same time influence the stock prices. Thus, the use of executives' insider trades could confound the effect of geographic proximity of insiders on their trading behavior. By focusing on non-executive insiders (hereafter, we refer to non-executive board members as insiders), we maintain a homogeneous set of private information among the insiders without the concern of insiders manipulating disclosures to facilitate their insider trades.

Insider trading data are obtained from the Thomson Reuters Insider Trading Database. The

database contains all transactions made by corporate insiders and provides the insiders' addresses in the SEC filings. Data on stock returns are from the CRSP database. Other control variables used in the multivariate analysis are from the Compustat database. We also extract merger and acquisition data from the SDC database. Our sample spans the period January 1996 through June 2007. Following prior literature (Aboody & Lev 2000; Seyhun 1992), we include only open market purchases and sales by corporate insiders, while transactions such as exercises of options and stock awards are excluded. We further exclude transactions involving fewer than 100 shares, as these trades are less likely to be information driven (Lakonishok & Lee 2001), and those with missing transaction dates or missing information about insiders' addresses.

One additional filter we apply to our sample is to require that each insider transaction contains a street address located within continental U.S. for the reporting person. As our proxy for the perceived probability of SEC enforcement is an insider's geographic proximity to an SEC regional office, we restrict our sample of insiders to those located within continental U.S. We verify that the addresses of corporate insiders reported in the insider trading database are either the addresses of their principal business offices or their residence addresses, by checking through a random sample of transactions. We assume that these addresses indicate the geographic locations where the insiders conduct their primary professional, civic, and social functions and activities. We further require that firms have valid headquarters addresses (using the Compustat database) because we use the distance between a firm's headquarters and the nearest SEC regional office as a control variable in our multivariate regression analysis in Section IV.

Our analyses differ from prior research in two aspects. First, we examine purchases and sales separately. While prior studies often aggregate purchases and sales into a net buy/sell measure (Aboody & Lev 2000; Huddart et al. 2007), this approach does not fit our setting because it treats insider sales as being as informative as purchases. Prior literature shows that purchases are most likely motivated by information whereas sales may be driven by multiple considerations, such as diversification, liquidity, and information exploitation (Bharath et al. 2008). Second, we perform some of our analyses at the firm-

insider level, as opposed to the aggregated trading activities at the firm level solely used in a number of prior studies. In this study, our focus is on the perceived probability of being punished for insider trading, which by its nature varies across individual insiders within a firm. By examining individuals' insider trading practices, we capture the variations in corporate insiders' perceived probability of getting caught for engaging in insider trading. Bharath et al. (2008) adopt a similar approach in their investigation of gender differences in insider trading.

We aggregate all transactions at the firm-insider level within a calendar week into one weekly transaction for that firm-insider-week combination. The choice of weekly intervals is based on the trade-off between the benefit of alleviating the concern that insiders spread their trading on a single piece of private information over several trading days and the risk of aggregating insider trades on multiple pieces of private information. In our view, the aggregation over one week strikes a reasonable balance.

[Table 1 about here]

Panel A of Table 1 presents the descriptive statistics of our sample of insider transactions. Row one shows that our full sample consists of 108,195 weekly insider transactions made by 23,032 corporate insiders in 7,390 firms, representing 28,874 unique firm-insider pairs. The purchase subsample consists of 46,327 weekly insider transactions and the sale subsample comprises 61,868 weekly insider transactions. The fact that our sample has more sale transactions than purchase transactions is consistent with prior studies and with the common practice that sale transactions are motivated by reasons in addition to private information, such as diversification and consumption.

Panel B of Table 1 reports summary statistics on the characteristics of insider transactions. The trading frequency is presented at the firm level as the total number of weekly insider transactions per firm over our sampling period. The mean (median) number of trades is 14.64 (8.00) per firm, with a mean (median) of 7.64 (4.00) trades for the purchase subsample and a mean (median) of 10.97 (5.00) for the sale subsample. The size-adjusted 13-week returns to insider transactions show a mean (median) of 1.92 (1.47) percent (the returns to sale transactions is multiplied with -1). For the purchase subsample, the

mean (median) return is 2.56 (0.36) percent, while the mean (median) return for the sale subsample is -1.44 (-2.23) percent.

Our primary variable of interest is the distance (in miles) between a corporate insider and the nearest SEC regional office in the region where the insider is located, which we term our "insider distance" measure (The Appendix lists the 11 SEC regional offices along with the names of the regions and the States included in each region.). We extract the address of a corporate insider from the insider trading database, which could be his/her primary business or residential address. We use the SEC website to identify the street addresses of the SEC regional offices. We then match the address for each insider with the nearest SEC regional office within the insider's region.

IV. Empirical Results

Univariate Analysis

Panel A of Table 2 reports the descriptive statistics of insider distance. For all insider trades, the average insider distance is 161.16 miles, with a median of 82.10 miles. For the purchase and sale subsamples, the mean insider distance is 165.87 and 154.51 miles, respectively.

Panel B of Table 2 presents the insider trading frequency. We partition our sample of weekly transactions into five groups based on the insiders' distance to the nearest SEC regional office. The average distance is 4.90 miles for the top quintile (which we label as "Close") and 462.58 miles for the bottom quintile (which we label as "Far"). For each distance quintile, we define the trading frequency as the number of weekly insider transactions for each firm and present the average number of transactions per firm. As argued in Bharath et al. (2008), insider purchases are mainly driven by trading on private information, whereas insider sales are motivated by considerations in addition to information, such as diversification and liquidation reasons. Therefore, we examine the trading frequency separately for the purchase and sale subsamples. As shown in Panel B of Table 2, for the purchase subsample, the mean (median) trading frequency is 3.95 (2.00) for the closest quintile and 5.42 (2.00) for the farthest quintile. The t test (t-stat =-5.27) suggests that corporate insiders who are close to SEC regional offices trade

significantly less frequently than those situated far from SEC regional offices. The Wilcoxon test shows that the distributions of the top quintile and the bottom quintile are significantly different (Wilcoxon Z =-3.86). For the sale subsample, the mean (median) trading frequencies for the top and bottom quintiles are 6.42 (3.00) and 6.74 (3.00), respectively. The t-test and Wilcoxon test suggest that there is no significant difference between the trading frequencies of these two quintiles. The finding that there is no significant difference in sales frequency across the distance quintiles suggests that sales transactions are less likely to be affected by the insiders' geographic proximity to the SEC.

In Panel C of Table 2, we group the weekly insider trades into distance quintiles and report the stock returns to the trades in each quintile. Specifically, we calculate the size-adjusted returns over the thirteen weeks following the insider trades. The purchase subsample has a mean (median) 13-week return of 2.85% (0.41%) for the closest quintile. In contrast, the mean (median) 13-week return for the farthest quintile is only 0.92% (-0.32%). Both t test (t =5.22) and Wilcoxon test (z=3.39) show that corporate insiders close to SEC regional offices trade on more profitable private information than those situated far from SEC regional offices. The sale subsample displays a similar pattern.[9]

[Table 2 about here]

Regression Results

We estimate the regression of the trading frequency after controlling for firm characteristics that affect insider trades. To facilitate the use of yearly firm characteristics, we measure the trading frequency in the regressions as the number of insider transactions for each firm-year over the individual distance quintiles. That is, we have the trading frequency, $FREQ_{i,j,t}$, if firm *i* has at least one insider transaction in year *t* by an insider who belongs to distance quintile *j*.

Panel A of Table 3 shows the descriptive statistics of $FREQ_{i,j,t}$. The subsample of insider purchase frequency comprises 21,702 observations with a mean (median) of 2.13 (1.00) transactions. The

[9] As the univariate analysis does not control for other factors that affect trading frequency and profitability, we should interpret the result with caution.

subsample of insider sale frequency comprises 22,796 observations with a mean (median) of 2.70 (2.00) transactions. We then take the average of the insider distances for all individual trades belonging to each frequency sample and use the averaged insider distance as the measure of the insider distance for that frequency sample. For the purchase subsample, the average (median) insider distance is 160.7 (82.2) miles, while the mean (median) insider distance for the sale subsample is 149.38 (51.6) miles. The frequency observations involve a total of 29,473 unique firm-years for 7,390 unique firms. We report an average (median) firm distance of 161.7 (62.8) miles. As for firm characteristics, the average (median) firm size (measured as the logarithm of the market capitalization) is 5.71 (5.65). These firm-years have a mean (median) return-on-asset of -1.68% (2.42%), but only 27% of the firm-years report a negative net income for the current year (hereafter, loss firms). The statistics also show that these firm-years have an average (median) market-adjusted stock return of 8.64% (-2.65%) in the previous year. Lastly, 39% of these firm-years have research and development expenditures which indicate a higher information asymmetry between the corporate insiders and outside investors (Aboody & Lev 2000).

In Panel B of Table 3, we examine how the trading frequency varies with the distance between the insiders and the closest SEC regional office. Specifically, we estimate equation (1) for the purchase frequency and sale frequency samples:

$$Log(FREQ_{i,j,t}) = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t})) + \beta_1(Firm\_dist_i) + \beta_2(LnMV_{i,t}) + \beta_3(BM_{i,t}) + \beta_4(Loss_{i,t}) + \beta_5(ROA_{i,t}) + \beta_6(RND_{i,t}) + \beta_7(PRE\_ABRET_{i,t}) + \varepsilon \quad (1)$$

Where

$FREQ_{i,j,t}$ = the number of insider purchases (insider sales) belonging to distance quintile j (j=0, 1, 2, 3 or 4) for firm i in calendar year t.

$Rank_j$ = the rank j (j=0, 1, 2, 3 or 4) of individual insider trades based on the driving distance from the insider's address to the closest SEC regional office, measured in miles using Google Maps and MapQuest. It is equal to 0 (4) for the quintile of insider trades with the shortest (longest) distance to the SEC regional offices.

$LnDistance_{i,j,t}$ = the natural logarithm of the average insiders' distance to SEC regional offices for all the insider trades (purchases or sales, respectively) belonging to the observation $FREQ_{i,j,t}$. The insider's distance for every trade is the driving distance from the insider's address to the closest SEC regional office, measured in miles using Google Maps and MapQuest.

$Firm\_dist_i$ = the natural logarithm of firm distance, which is the driving distance from the headquarters of the firm to the closest SEC regional office, measured in miles using Google Maps and MapQuest.

$LnMV_{i,t}$ = the natural logarithm of the market value of the firm, measured at the end of the year.

$BM_{i,t}$ = the book-to-market ratio of the firm, measured at the end of each year.

$Loss_{i,t}$ = a dummy variable equal to 1 if the firm reports a negative net income for year t.

$ROA_{i,t}$ = the return on assets for year t.

$RND_{i,t}$ = a dummy variable equal to 1 if the firm reports R&D expenditures in year *t*, and 0 otherwise.

$PRE\_ABRET_{i,t}$ = one-year market adjusted returns before the current year (i.e., for year t-1).

[Table 3 about here]

We include the company's distance from the nearest SEC regional office, *Firm_dist*, to control for the effectiveness of SEC enforcement attributable to the distance between the firm and the SEC office. Other control variables are included, as prior literature finds them associated with the frequency or profitability of insider trades. Specifically, we control for firm size (*LnMV*) and book-to-market ratio (*BM*), which are associated with the cross-sectional variation in the number of insider transactions (Huddart et al. 2007) and the returns to insider trades (Lakonishok & Lee 2001). Firm performance is one of the factors affecting insider trades. Following Huddart & Ke (2007), we include return-on-assets (*ROA*) as one control variable and an indicator for loss firms (*LOSS*) which refer to those firms reporting a negative net income for the current year. Aboody & Lev (2000) argue that firms with R&D expenditures have greater information asymmetry. They predict and find that transactions by insiders in firms with R&D expenditures are relatively more profitable than trades by insiders in firms without R&D expenditures. We include an indicator, *RND*, which is equal to 1 if the firm reports R&D expenditures in year *t*, and 0 otherwise. Finally, prior returns (*PRE_ABRET*) are included because insiders tend to be contrarian (i.e., insider selling (buying) is greater (lower) after high stock returns and lower (higher) after low stock returns), as documented by Rozeff & Zaman (1998) and Lakonishok & Lee (2001).

We run yearly regressions over the sampling period (i.e., 12 yearly regressions) and follow Fama & MacBeth (1973) in presenting the average coefficients with t-statistics under the coefficient estimates. As reported in Panel B of Table 3, the variable of interest, the distance quintile rank (*Rank*), has a positive

coefficient at the 0.01 significance level (coefficient=0.010, t=3.40) for the insider purchase subsample, but an insignificant coefficient for the sale subsample. This suggests that insiders close to the SEC offices make relatively fewer buying transactions than those far from the SEC offices. The results are similar when using the logarithm of the average insider distance (*Ln(Distance)*).. Hence, the evidence supporting our hypothesis mainly comes from the sample of insider purchases, which are more likely to be driven by insiders' private information (Lakonishok & Lee 2001; Jeng et al.2003; Bharath et al. 2008).

We also find that insiders in firms closer to SEC offices conduct fewer buying activities, though their selling activities are not affected by firms' distance to the SEC, as evidenced by the coefficients on firm distance (*Ln(Firm_dist)*) (t=3.87 and 3.38 for the two regression specifications for insider purchases, respectively; t=-0.50 and -0.65 for the two regression specifications for insider sales, respectively). We find lower trading frequency for large firms and firms with higher book-to-market ratios, as shown by the negative coefficients on firm size (*LnMV*) and *BM*. Other control variables have different impacts on purchases than on sales. Specifically, both measures of firm performance (*Loss* and *ROA*) are correlated with insiders' buying activities, but have no effect on insiders' selling activities. Similarly, prior stock performance (*PRE_ABRET*) is positively correlated with insider selling, but not correlated with insider buying. Interestingly, for firms with R&D expenditures (*RND* =1), insiders make fewer purchases (coefficient =-0.132, significant at 0.01 level for both purchase regressions) but conduct more sales (coefficient=0.039, significant at 0.01 level for both sale regressions). These asymmetric impacts of firm characteristics on insiders' buying and selling activities highlight the importance of estimating the regressions for insider purchases and insider sales separately.

Table 4 reports the effect of geographic proximity to the SEC on the trading profitability of insider transactions. In this section, we are able to perform our analyses on the basis of individual transactions. Therefore, although we control for the same set of firm characteristics as in Equation (1), the use of individual transactions prompts us to re-define the control variables as *quarterly* firm characteristics for each trade, rather than the *yearly* firm characteristics used in Equation (1). Specifically, in the regression of Equation (2), we use quarterly measures for all firm characteristics except

PRE_ABRET, which now represents the market adjusted returns for the week in which insider trades occur. Moreover, the regressions based on individual transactions allow us to use *individual* insider distances to the SEC offices, rather than the *averaged* insider distances as in Equation (1), in addition to the distance quintile ranks.

$$RET_{i,j,t} = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t})) + \beta_1(Firm\_dist_i) + \beta_2(LnMV_{i,t}) + \beta_3(BM_{i,t}) + \beta_4(LOSS_{i,t}) + \beta_5(ROA_{i,t}) + \beta_6(RND_{i,t}) + \beta_7(PRE\_ABRET_{i,t}) + \varepsilon \qquad (2)$$

where

$RET_{i,j,t}$ = the size-adjusted returns to the individual trades by insider j for firm i, measured over 13 weeks following the insider trades.

$Rank_j$ = the rank j (j=0, 1, 2, 3 or 4) of individual insider trades based on the driving distance from the insider's address to the closest SEC regional office, measured in miles using Google Maps and MapQuest. It is equal to 0 (4) for the quintile of insider trades with the shortest (longest) distance to the SEC regional offices.

$LnDistance_{i,j,t}$ = the natural logarithm of the driving distance from the insider's address to the closest SEC regional office, measured in miles using Google Maps and MapQuest.

$Firm\_dist_i$ = the natural logarithm of firm distance, which is the driving distance from the headquarters of the firm to the closest SEC regional office, measured in miles using Google Maps and MapQuest.

$LnMV_{i,t}$ = the logarithm of the market value of the firm at the end of quarter t.

$BM_{i,t}$ = the book-to-market ratio of the firm for quarter t.

$Loss_{i,t}$ = a dummy variable equal to 1 if the firm reports a negative net income for quarter t.

$ROA_{i,t}$ = the return on assets for quarter t.

$RND_{i,t}$ = a dummy variable equal to 1 if the firm reports R&D expenditures in year *t*, and 0 otherwise.

$PRE\_ABRET_{i,t}$ = the market adjusted returns for the week during which insider trades occur.

The dependent variable $RET_{i,j,t}$ is the size-adjusted returns measured over the 13 weeks following the insider trade. We use two measures of insider distance in the regression: the rank of insider distance (*Rank*) and the natural logarithm of insider distance (*Ln(Distance)*). We control for the natural logarithm of the distance between the firm's headquarters and the closest SEC regional office (*Ln(Firm_dist)*). We run yearly regressions of Equation (2) and report the average estimated coefficients. Panel A of Table 4 presents the descriptive statistics for the control variables. These individual insider trades comprise 51,478 unique firm quarters and the average firm size (measured as the logarithm of market capitalization) is 5.82, with the median of 5.74. The average book-to-market ratio is 0.55, with a median of 0.45. The loss dummy (*Loss*) shows that 24 percent of these firm quarters report a loss. The mean quarterly *ROA* is -0.22 percent and the median is 0.63 percent, suggesting that while most firms have

positive returns on assets, the performance of some firms has been very poor. We also find that 38 percent of these firm quarters belong to fiscal years with R&D expenditures. Lastly, for the 108,195 observations, the mean (median) market-adjusted weekly return is 0.64% (0.09%).

Table 4, Panel B reports the regression results for the purchase and sale subsamples, respectively. We find negative coefficients on the rank measure of insider distance (*Rank*) and the natural logarithm of insider distance (*Ln(Distance)*), both at the 0.01 significance level (t= -5.58 and -4.11, respectively), for insider purchases subsample. These results show that insiders located farther from SEC regional offices earn lower returns on average in their buying transactions. Consistent with prior literature (e.g., Aboody & Lev 2000), we find higher returns to insider purchases for firms with R&D expenditures (t= 2.82 and 2.85, respectively, for *RND*) and firms with higher book-to-market ratios (t= 2.67 and 2.65, respectively, for *BM*). In addition, the returns to insider purchases are negatively correlated with weekly returns for the weeks in which the insider purchases occur (t=-1.77 and -1.79, respectively, for *PRE_ABRET*). Such a negative correlation implies that trading profitability is at least partially subject to the reversal of previous stock returns. Overall, the purchases by insiders close to SEC regional offices earn higher returns than those by insiders far from the SEC regional offices. This result is consistent with the finding in the law and economics literature that the crime deterrence effect of the perceived legal enforcement is strong for non-serious offenses, but not significant for more serious offenses (Witte 1980).

For insider sales subsample, we find insignificant coefficients on both distance measures (t= -0.48 and -0.67, respectively). This is probably due to the smaller impact of SEC enforcement on insider sales than on insider purchases, as these sales are more likely due to non-information considerations than insider purchases.

[Table 4 about here]

Portfolio Analysis

Following prior studies (e.g., Aboody et al. 2005), we test the variation in trading profitability using abnormal portfolio returns from a calendar time multi-factor pricing model. The use of portfolio

analysis offers us an opportunity to assess the economic magnitude of the difference in the trading profitability between insiders close to and those far from the SEC. Specifically, we estimate the excess portfolio returns using the Fama & French (1993) three-factor model, augmented by a momentum factor proposed by Carhart (1997):

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + \delta_p SMB_t + \sigma_p HML_t + \lambda_p UMD_t + \varepsilon_{p,t} \quad (3)$$

where:

$R_{p,t}$ = the portfolio p's weekly return;
$R_{f,t}$ = the risk-free rate, measured as the one-week treasury bill rate;
$R_{m,t}$ = the weekly market portfolio return, measured using the CRSP value-weighted index;
SMB_t = the weekly Fama and French 1993 size factor return;
HML_t = the weekly Fama and French 1993 market-to-book factor return;
UMD_t = the weekly Carhart 1997 momentum factor return.

The four independent variables in Equation (3) correspond to four commonly modeled risk factors that help to explain the portfolio returns: $(R_{m,t} - R_{f,t})$ is the excess return on a value-weighted market return to proxy for the market risk; *SMB* and *HML* are included to capture the effects of size and book-to-market ratios on risk premiums, respectively; and *UMD* is used to control for the momentum effect of stock performance. To begin with, we partition the sample of insider trades into quintiles based on the insider distance. With each distance quintile, we separate purchases from sales. As a result, we have 10 groups of insider transactions from the intersection of the quintiles based on insider distance and insider trade type (purchases or sales). For each group, we construct a portfolio using the formation period/holding period strategy in Jegadeesh & Titman (1993). Specifically, in each calendar week, we form a portfolio by including all firms with insider trades (purchases or sales) in the previous period of 13 weeks. For buy portfolios, we use the stock returns of the current week for the firms with previous insider purchases; for sell portfolios, we use the stock returns of the current week for the firms with previous insider sales, multiplied by -1. The portfolio return is then computed as the weighted average of the weekly stock returns of firms included in the portfolio, using the number of trades for each firm as the weights.[10] The composition of each portfolio is rebalanced every week.

[10] Prior studies use monthly returns in the multi-factor pricing model. Recently, Kenneth French has provided the weekly three-factor returns on his website, enabling us to use a finer return measure in our test. We constructed the weekly momentum factor returns ourselves, based on the Carhart (1997) methodology.

We run time-series regressions for these portfolios based on 574 weeks of data, from June 29, 1996 to June 23, 2007, to estimate the intercept and factor loadings.[11] For insider purchases (i.e., buy portfolios), the factor loadings on the three Fama & French (1993) risk factors and the Carhart (1997) momentum factor are statistically significant for each portfolio (untabulated). For insider sales (i.e., sell portfolios), the factor loadings are also generally significant, except that the loading on the *UMD* factor is not significant in three out of five quintile portfolios and the loading on the *HML* factor is not significant in the top distance quintile portfolio (untabulated).

[Table 5 about here]

Table 5 reports the portfolio results. Our primary interest is the Jensen's alphas (intercepts), α_p, as a measure of abnormal returns for each portfolio, after controlling for the Fama & French (1993) risk factors and the Carhart (1997) momentum factor. As expected, the estimated intercepts from the time-series regressions of the portfolio returns on the four risk factors are all positive when forming a portfolio based on insiders' purchases. The magnitude of abnormal returns decreases from the top quintile to the bottom quintile. Specifically, for the buy portfolios, the abnormal weekly return is 44.6 basis points for the top distance quintile (Q1), but only 28.9 basis points for the bottom distance quintile (Q5). A hedge portfolio, which is long on the top quintile and short on the bottom quintile, produces a weekly abnormal return of 15.6 basis points (or a yearly abnormal return of 8.11 percent assuming 52 weeks per year) that is significant at the 0.01 level (t=2.92). In contrast, no significant difference in abnormal returns to stock portfolio can be achieved for sell portfolios based on insider sales (t=-1.07). Furthermore, Using the portfolio strategy of Buy-Sell, we find that the difference in the portfolio returns between Q1 and Q5 is a weekly abnormal return of 21.8 basis points (t=2.88), or a yearly abnormal return of 11.34%. We conclude that insiders selectively trade on more profitable private information when they have a higher perceived cost imposed by the geographic presence of the SEC offices.

[11] We need at least 26 weeks of insider trades to form portfolios for the robustness portfolio analyses of 4-week and 26-week intervals. As a result, we have to drop the first 26 weeks of insider trade observations in the sample of weekly insider trades.

V. Additional Analysis: Alternative Explanations

In this section, we conduct several robustness tests to differentiate our position from the alternative explanations that geographic proximity may represent other location-specific information and/or cultural factors.

Information or Perception Deterrence

Many insiders' transactions occur around the announcements of mergers and acquisitions (M&A, thereafter). Earnings announcements are another major type of corporate information event. M&A and earnings announcements are both information intensive events and hence are subject to a high level of SEC scrutiny (Seyhun 1992). Prior literature has documented that insiders refrain from trading during these information intensive periods to avoid scrutiny from the regulators (Seyhun 1992). In this section, we investigate whether the higher regulatory risk around M&A and earnings announcements attenuates the finding of differential insider trading profitability as documented for insider purchases in the previous section. Specifically, we create two dummy variables to capture the insider trades that occur during the periods around these two types of events. The first dummy variable is equal to one for the insider trades within six months before and after an M&A announcement. We consider the period after M&A announcements because a manager can dispose or confirm the process of an M&A even after it has been announced. The announcement dates of M&A cases are from the SDC database. There are a total of 9,608 purchases with *Eventdummy*=1 for M&A cases. Similarly, we define the second dummy variable as equal to one if an insider trade within three weeks before and after an earnings announcement. There are 22,378 purchases with *Eventdummy*=1 for earnings announcements.

[Table 6 about here]

Table 6 presents the results solely for the insider purchase subsample, as the difference in trading profitability only concerns insiders' buy transactions. As presented in the first regression, for the regressions using the M&A indicator, the coefficients on *Rank* and *Ln(Distance)* represent the average effect of geographic distance to the SEC on insider purchases' profitability for all observations without

considering the timing of transactions around M&A events. The interaction terms, *Rank*EventDummy* and *Ln(Distance)*EventDummy* in Columns (1) and (2) respectively, capture the incremental effects of geographic distance on the insider trading profitability solely for those insider purchases around M&A events (i.e., when *EventDummy*=1). The coefficients on the interaction terms are significantly positive for both cases (coefficient=0.010 with t=4.08 for the *Rank* measure and coefficient=0.009 with t=3.90 for the *Ln(Distance)* measure), suggesting a weaker effect of insider distance on insider trading profitability during the windows around M&A events. To examine whether the distance effect still exists for the subsample of *Eventdummy*=1 (i.e., whether $\beta_1+\beta_2$ is different from zero), we run the yearly regressions of equation (2) separately for the *Eventdummy*=1 insider purchase subsample. The untabulated results show an insignificant coefficient on the distance measures. These findings suggest that the higher trading profitability of insiders close to the SEC does not result from the trades on private information concerning M&A events, which are under the close scrutiny of the SEC.

As presented in Columns (3) and (4) in Table 6, we find similar regression results using the event dummy variable for the earnings announcements. Specifically, the coefficients on *Rank* and *Ln(Distance)* standalone variables are significantly negative at the 0.01 level, suggesting a negative correlation, on average, between geographic distance to the SEC and insider purchases' profitability for overall sample. The interaction terms *Rank*EventDummy* and *Ln(Distance)*EventDummy* capture the incremental impact of the trades around earnings announcements on the relation between insider trading profitability and the geographic proximity to the SEC regional offices. Our results show positive coefficients on the interaction terms in both specifications (coefficient=0.004 with t=2.40 for the *Rank* measure and coefficient=0.004 with t=2.76 for the *Ln(Distance)* measure), suggesting a weakened correlation between the insiders' geographic proximity to the SEC and their trading profitability. In an untabulated analysis, we still find statistically significant negative coefficients on the two distance measures when we estimate Equation (2) only for the *Eventdummy*=1 subsample. These results suggest that the difference in trading profitability between insiders close to and those far from the SEC is much smaller around earnings announcements than in other trading periods.

In summary, the results in this subsection are consistent with the view that insiders strike a balance between trading on more profitable information when trading opportunities are limited and avoiding legal and regulatory scrutiny from the SEC during high-risk periods, such as M&A and earnings announcements.

Urban-versus-Rural Insiders

One potential alternative explanation for our findings is that our measure of insiders' distance to the SEC may simply capture the urban-versus-rural effect. Specifically, since all SEC regional offices are located in big cities, the geographic proximity of insiders to the SEC regional offices may simply capture the fact that these insiders are located in the metropolitan areas. Compared with insiders located in rural areas, those insiders located in metropolitan areas have better access to various information sources, thereby enabling them to corroborate the accuracy of their private information and to make a better use of this private information in their trades. To rule out this alternative explanation, we conduct main analyses using only the sample of insider trades made by urban insiders. We define an urban area as a metropolitan area with a population of more than one million.

Table 7 presents the results. For brevity, we show the tests of the frequency and profitability of insider trades in one table. Urban insiders made a total of 31,870 buy transactions, representing 68.8% of the 46,327 buy transactions in the full sample. For the test of trading frequency, we obtain 16,002 frequency observations. We estimate the yearly regressions of Equation (1) for the trading frequency and Equation (2) for the trading profitability. We then report in Table 7 the Fama and MacBeth (1973) mean coefficients with the corresponding t-statistics.

The results are similar to those reported in previous sections. Urban insiders conduct fewer insider purchases when their addresses are closer to the SEC regional offices (coefficient=0.019 with t=4.78 for *Rank* in Column (1); coefficient=0.016 with t=4.46 for *Ln(Distance)* in Column (2)). On the other hand, urban insiders closer to the SEC regional offices selectively trade on more profitable private information, as suggested by the negative coefficient on *Rank* in Column (3) (coefficient=-0.003 with t=-3.00) and the

negative coefficient on *Ln(Distance)* in the Column (4) (coefficient=-0.002 with t=-2.43). Therefore, we find similar results using only the sample of urban insiders' trades and our main conclusions are not attributable to the urban-versus-rural factors.

Insiders from Areas other than Los Angeles, New York and San Francisco

In this section, we try to control for other location-specific advantages that may contribute to our findings. Some SEC regional offices are located in the areas that are featured by multi-cultural centers, internationalized business models, and/or clustering of certain industries (e.g., high-tech firms). Of particular concern are the metropolitan areas of Los Angeles, New York, and San Francisco. Therefore, we re-examine the tests of trading frequency and profitability after excluding insiders located in these three metropolitan areas.

Table 8 reports the results for the purchases made by insiders situated in areas other than Los Angeles, New York, and San Francisco. We have a total of 35,360 individual buy transactions, representing 76.3% of the 46,327 buy transactions in the full sample. These individual purchases make a sample of 16,492 yearly trading frequency observations. Consistent with the results in our main analysis, we find that the insider distance rank (*Rank*) is positively associated with trading frequency (coefficient=0.013 in Column (1)) and negatively associated with trading profitability (coefficient= -0.004 in Column (3)). Both coefficients are significant at the 0.01 level (t=3.10 and -2.81, respectively). The results for *Ln(Distance)* are similar. These results suggest that our main conclusions are not driven by insiders' location features of multi-cultures, the extent of internationalization or the clustering of high-tech firms.

Change Analysis based on Insiders' Address Changes

To further corroborate our findings that corporate insiders' geographic distance to the SEC regional offices has an impact on their inside trading behavior, we perform a change analysis to provide additional evidence on the causality of the negative association between insider geographic distance and trading profitability, and to control for other unobservable factors that may be correlated with both the

insiders' geographic distance to the SEC and their insider trading. We identify those insiders who changed their residential addresses during the sample period. We require that these insiders have moved closer to or further away from the SEC by at least 50 miles to qualify for a meaningful distance change. We further require at least one insider trade made by an insider in both the periods before and after the address change. We use a dummy variable (*POST*) to capture the effect of changes of geographic proximities on insider trading profitability.

In the untabulated analysis, we regress the trading profitability of individual trades on the dummy variable, *POST*, and other firm characteristics. We find that when insiders move closer to the SEC, their trades are significantly more profitable than their trades made before the address change (the coefficient on *POST* is 0.030 with a t-statistic of 2.73, untabulated). This finding is consistent with the notion that the heightened awareness of the sanctions risk resulting from the closer proximity to the SEC makes the insiders trade only on the private information of higher profitability. Interestingly, for insiders moving further away from the SEC, they do not appear to earn a lower return from their trades although we do find a negative coefficient on *POST* (the coefficient on *POST* is -0.016 with a t-statistic of -1.42, untabulated). One potential explanation for the asymmetric results of moving closer to and further away from the SEC is that the awareness can be readily raised when the insiders get more exposure to the SEC enforcement but it cannot be adjusted down once the level of awareness has already been set even if the exposure to the SEC is reduced.

Insiders' Short-swing Trades

The SEC's Rule 16-B regulation requires corporate insiders to return back the company any profits made from the purchase and sale of this company's stock if both transactions occur within a six-month period. In other words, Insiders may conduct short-wing trades, which refer to the purchase (or sale) transaction followed by a sale (or purchase) transaction within six months. The Rule 16-B was implemented to prevent insiders, who have access to material non-public company information, from making short-term profits.

Compared with other insider trades, the short-swing trades are obviously opportunistic insider trades through which insiders benefit from their material non-public private information and thus might have higher profitability. We empirically examine the prevalence of short-wing trades in our sample so as to investigate the extent to which our main results are driven by this type of opportunistic insider trades. We find that only 2,669 of the total 108,195 trades (i.e., 2.46%) are short-swing trades. Our results are quantitatively similar to those reported in the paper after excluding these short-swing trades (untabulated).

VI. Conclusion

In this paper we investigate the impact of the SEC's enforcement of insider trading regulations on the frequency and profitability of insider trades. While prior literature provides no direct evidence in this regard, this remains an important question, given that the SEC is the primary federal authority enforcing insider trading laws. Building on the perception-based crime deterrence literature and the literature on geographic proximity and social (mis)conduct, we argue that corporate insiders located close to the SEC regional offices perceive a higher probability of getting caught for engaging in insider trading. This argument leads to our use of the insiders' geographic proximity to the SEC's regional offices to proxy for the perceived probability of punishment for insider trading.

We predict and find that the insiders who are located closer to the SEC's regional offices conduct fewer insider trades. Our empirical analysis further shows that when insiders are located closer to an SEC regional office, their transactions generate higher returns. The fact that insiders selectively trade on more profitable private information when located closer to the SEC is consistent with the findings documented by the crime literature that the deterrence of the law enforcement has a more pronounced effect on non-serious offenses than on the serious offenses (Witte 1980). Our finding of higher profitability for insiders closer to the SEC mainly concentrate on the sample of insider purchases, which are more likely to be driven by insiders' private information and hence subject to a greater extent of SEC oversight compared to the sample of insider sales. Additional analyses show that this difference in trading profitability of insider purchases is not attributable to trades conducted around significant information events, such as

M&A and earnings announcements, which tend to be closely scrutinized by the SEC. Our main conclusions still hold when (1) using the sample of urban insiders; (2) using the sample excluding insiders from the three largest metropolitan areas (Los Angeles, New York, and San Francisco); (3) using the sample of insiders who moved closer to the SEC; (4) using the insider trades excluding insiders' short-swing trades.

Overall, our findings indicate that the SEC has a significant deterrent effect on insider trading activities and that insiders make a trade-off between the perceived cost of sanctions risk and the desired trading profits from their transactions. Our study makes a valuable addition to the literature on insider trading and provides new insights into the impact of the SEC's enforcement program on insiders' trading behavior, which has been largely ignored in the literature, despite the fact that the SEC regulates insider trading in the U.S. capital markets.

References

Aboody, D., Hughes, J., & Liu, J. (2005). Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research* 43 (5): 651-673.

Aboody, D., & Lev, B. (2000). Information asymmetry, R&D, and insider gains. *Journal of Finance* 55 (6): 2747-2766.

Bachman, R., Paternoster, R., & Ward, S. (1992). The rationality of sexual offending - Testing a deterrence rational choice conception of sexual assault. *Law & Society Review* 26 (2): 343-372.

Becker, G. S. (1968). Crime and punishment - Economic approach. *Journal of Political Economy* 76 (2): 169-217.

Bettis, J. C., Coles, J. L., & Lemmon, M. (2000). Corporate policies restricting trading by insiders. *Journal of Financial Economics* 57 (2): 191-220.

Bharath, S. T., Narayanan, M. P., & Seyhun, H. N. (2008). Are women executives disadvantaged? Working paper, Washington University.

Bhattacharya, U., & Daouk, H. (2002). The world price of insider trading. *Journal of Finance* 57: 75-108.

Braithwaite, J. (1989). *Crime, Shame and Reintegration*. Cambridge: Cambridge University Press.

Bushee, B. J., Jung, M. J., & Miller, G. S. (2011). Conference presentations and the disclosure milieu. *Journal of Accounting Research* 49 (5): 1163-1192.

Carhart, M. (1997). On persistence in mutual fund performance. *Journal of Finance* 52: 57-82.

Carlton, D., & Fischel, D. (1983). The regulation of insider trading. *Stanford Law Review* 35: 857-895.

Cheng, Q., Du, F., Wang, X., & Wang, Y. (2014). Are investors' corporate site visits informative? Working paper, Singapore Management University, The University of Hong Kong, and Central University of Finance and Economics.

Cheng, Q., Du, F., Wang, X., & Wang, Y. (2015). Seeing is believing: Do analysts benefit from site visits? Working paper, Singapore Management University, The University of Hong Kong, and Central University of Finance and Economics.

Coval, J., & Moskowitz, T. (2001). Geography of investment: informed trading and asset prices. *Journal of Political Economy* 109 (4): 811–841.

DeFond, M., Francis, J., & Hu, X. (2011). The geography of sec enforcement and auditor reporting for financially distressed clients. Working paper, University of Southern California.

Fama, E., & French, K. (1993). Common risk-factors in the returns on stocks and bonds. *Journal of Financial Economics* 33 (1): 3-56.

Fama, E., & MacBeth, J. (1973). Risk, teturn, and equilibrium - Empirical tests. *Journal of Political Economy* 81 (3): 607-636.

Garfinkel, J. A. (1997). New evidence on the effects of federal regulations on insider trading: The Insider Trading and Securities Fraud Enforcement Act (ITSFEA). *Journal of Corporate Finance* 3: 89-111.

Giannetti, M., & Wang, T. (2015), Corporate scandals and household stock market participation. Working paper, University of Minnesota.

Glaeser, E. L., Sacerdote, B., & Scheinkman, J. (1996). Crime and social interactions. *Quarterly Journal of Economics* 111 (2): 507-548.

Glaeser, D., Sarcedote, B., & Scheinkmen, J. (1996). Crime and social interactions. *Quarterly Journal of Economics* 111 (2): 507–548.

Green, T., Jame, R., Markov, S., & Subasi, M. (2014). Access to management and the informativeness of analyst research. *Journal of Financial Economics* 114: 239–255.

Hollinger, R., & lanza-Kaduce, L. (2009). Academic dishonesty and the perceived effectiveness of countermeasures: An empirical survey of cheating at a major public university. *NASPA Journal* 46: 587-602.

Huddart, S., Ke, B., & Shi, C. (2007). Jeopardy, non-public information, and insider trading around SEC 10-K and 10-Q filings. *Journal of Accounting & Economics* 43 (1): 3-36.

Huddart, S. J., & Ke, B. (2007). Information asymmetry and cross-sectional variation in insider trading. *Contemporary Accounting Research* 24 (1): 195-232.

Ivkovich, Z., & Weisbenner, S. (2005). Local does as local is: information content of the geography of individual investors' common stock investments. *Journal of Finance* 60: 267–306.

Jaffe, J. F. (1974). Effect of regulation changes on insider trading. *Bell Journal of Economics* 5: 93-121.

Jagolinzer, A. D. (2009). SEC Rule 10b5-1 and Insiders' Strategic Trade. *Management Science* 55 (2): 224-239.

Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers - Implications for stock-market efficiency. *Journal of Finance* 48 (1): 65-91.

Jendrek, M. P. (1992). Students reactions to academic dishonesty. *Journal of College Student Development* 33 (3): 260-273.

Jeng, L. A., Metrick, A., & Zeckhauser, R. (2003). Estimating the returns to insider trading: A performance-evaluation perspective. *Review of Economics and Statistics* 85 (2): 453-471.

Lakonishok, J., & Lee, I. (2001). Are insider trades informative? *Review of Financial Studies* 14: 79-111.

Lochner, L. (2007). Individual perceptions of the criminal justice system. *American Economic Review* 97 (1): 444-460.

Kedia, S., Panchapagesan, V., & Uysal, V. (2008). Geography and acquirer returns. *Journal of Financial Intermediation* 17(2): 256-275.

Kedia, S., & Rajgopal, S. (2011). Do the SEC's enforcement preferences affect corporate misconduct? *Journal of Accounting and Economics* 51: 259-278.

Malloy, C. J. (2005). The geography of equity analysis. *Journal of Finance* 60: 719-755.

McCabe, D. L. (1993). Faculty responses to academic dishonesty - The influence of student honor codes. *Research in Higher Education* 34 (5): 647-658.

McCabe, D. L., & Trevino, L. (1993). Academic dishonesty - Honor codes and other contextual influences. *Journal of Higher Education* 64 (5): 522-538.

McCabe, D. L., Trevino, L. K., & Butterfield, K. (1999). Academic integrity in honor code and non-honor code environments - A qualitative investigation. *Journal of Higher Education* 70 (2): 211-234.

Nagin, D. S. (1998). Criminal deterrence research at the outset of the twenty-first century. *Crime and Justice: A Review of Research, Vol 23* 23: 1-42.

Nagin, D. S., & Pogarsky, G. (2003). An experimental investigation of deterrence: Cheating, self-serving bias, and impulsivity. *Criminology* 41 (1): 167-193.

O'Brien, P., & Tan, H. (2015). Geographic proximity and analyst coverage decisions: Evidence from IPOs. *Journal of Accounting and Economics* 59: 41–59.

O'Donnell, J. A., Doe, & Smith, J. (1976). *Young Men and Drugs - A Nationwide Survey*. Rockville, Md: National Institute on Drug Abuse.

Parsons, C., Sulaeman, J., & Titman, S. (2014). The Geography of Financial Misconduct. Working paper, University of California, San Diego.

Parsons, C., Sulaeman, J., & Titman, S. (2015). Swimming upstream: Struggling firms in corrupt cities. Working paper, University of California at San Diego.

Paternoster, R., & Simpson, S. (1996). Sanction threats and appeals to morality: Testing a rational choice model of corporate crime. *Law & Society Review* 30 (3): 549-583.

Pirinsky, C., & Wang, Q. (2006). Does corporate headquarters location matter for stock returns? *Journal of Finance* 61: 1991–2015.

Pirinsky, C., & Wang, Q. (2010). Geographic location and corporate finance: A review. In Handbook of Emerging Issues in Corporate Governance, World Scientific Publishing.

Pitt, H., & Shapiro, K. (1990). Securities regulation by enforcement: A look ahead at the next decade. *Yale Journal on Regulation*: 149-320.

Richards, P., & Tittle, C. (1982). Socioeconomic-status and perceptions of personal arrest probabilities. *Criminology* 20 (3-4): 329-346.

Rozeff, M. S., & Zaman, M. (1998). Overreaction and insider trading: Evidence from growth and value portfolios. *Journal of Finance* 53 (2): 701-716.

Sah, R. K. (1991). Social osmosis and patterns of crime. *Journal of Political Economy* 99: 1272-1295.

Scannell, K. (2008). Top SEC attorney Schonfeld to leave for private practice. *The Wall Street Journal*, Sep. 10.

Seyhun, H. N. (1992). The Effectiveness of the insider-trading sanctions. *Journal of Law & Economics* 35 (1): 149-182.

Shapiro, S. P. (1984). *Wayward Capitalists: Target of the Securities and Exchange Commission*. New Haven, CT: Yale University Press.

Tonry, M. (1995). *Malign Neglect-Race, Crime, and Punishment in America*. New York: Oxford University Press.

Wilson, J. Q., & Kelling, G. (1982). The police and neighborhood safety: Broken windows. *The Atlantic* 249 (3): 29-38.

Witte, A. D. (1980). Estimating the economic-model of crime with individual data. *Quarterly Journal of Economics* 94 (1): 57-84.

Appendix: **SEC Regional Offices, Regions, and States in each Regional Jurisdiction**

SEC Regional Office	Region	States in Regional Jurisdiction
New York Philadelphia Boston	Northeast	Connecticut; Delaware; District Of Columbia; Maine; Maryland; Massachusetts; New Hampshire; New Jersey; New York; Pennsylvania; Rhode Island; Vermont; Virginia; West Virginia
Chicago	Midwest	Illinois; Indiana; Iowa; Kentucky; Michigan; Minnesota; Missouri; Ohio; Wisconsin
Atlanta Miami	Southeast	Alabama; Florida; Georgia; Louisiana; Mississippi; North Carolina; South Carolina; Tennessee
Dallas-Fort Worth Denver Salt Lake City	Central	Arkansas; Colorado; Kansas; Nebraska; New Mexico; North Dakota; Oklahoma; South Dakota; Texas; Utah; Wyoming
San Francisco Los Angeles	Pacific	Arizona; California; Idaho; Montana; Nevada; Oregon; Washington

Table 1
Descriptive Statistics

This table presents the summary statistics on the open-market transactions by corporate insiders for the period of January 1, 1996 through June 29, 2007. The raw transactions are aggregated into weekly trades which all analyses are based on. Panel A reports the summary statistics on insider trades. In Panel B, statistics are presented for the trading frequency at the firm level and the 13-week size-adjusted returns of individual weekly trades. The returns for the full sample of insider transactions are based on the returns to purchases and the returns to sales (size-adjust returns multiplied by -1 for sales).

Panel A: Summary statistics on insider trading.

	No. of Transactions	No. of Insiders	No. of Firms	No. of Insider-Firm pairs
Full sample	108,195	23,032	7,390	28,874
Purchases	46,327	14,574	6,064	17,373
Sales	61,868	13,741	5,642	15,999

Panel B: The characteristics of insider trades

	N	Mean	25%	Median	75%	Std. Dev.
Trading Frequency (firm level)						
Full sample	7,390	14.64	3.00	8.00	18.00	20.13
Purchases	6,064	7.64	2.00	4.00	9.00	12.17
Sales	5,642	10.97	2.00	5.00	13.00	16.94
Returns (13-week, size-adjusted, %)						
Full sample	108,195	1.92	-10.58	1.47	13.91	25.10
Purchases	46,327	2.56	-11.38	0.36	13.03	25.85
Sales	61,868	-1.44	-14.51	-2.23	9.91	24.51

Table 2
Univariate Analysis

This table reports the univariate test regarding how the trading frequency and profitability vary with insiders' distances to the SEC regional offices. Panel A reports the descriptive statistics of the distance to the SEC offices for the sample of unique individual insiders. In Panel B, the average number of insider trades for individual firms is presented for each distance quintile, with the median value in parentheses. Panel C shows the summary statistics of the 13-week size-adjusted returns for individual transactions in each distance quintile, with median values in the parentheses below the mean values. In Panels B and C the rightmost column reports the t test and Wilcoxon test for the difference in mean and median between the "close" and "far" quintiles. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

Panel A: Descriptive statistics of individual insiders' distance to SEC offices (Miles)

	N	Mean	25%	Median	75%	Std. Dev.
Full sample	23,032	161.16	22.60	82.10	271.00	184.20
Purchase	14,574	165.87	23.60	98.33	279.00	181.78
Sales	13,741	154.51	21.10	60.00	265.00	184.66

Panel B: Number of insider trades per firm across distance quintiles

Distance Rank	Close	2	3	4	Far	Diff
Mean distance (miles)	4.90	27.66	74.99	223.68	462.58	
Purchases	3.95	3.58	4.25	4.89	5.42	-5.27***
	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)	-3.86***
Sales	6.42	6.36	6.30	6.02	6.74	-0.80
	(3.00)	(3.00)	(3.00)	(3.00)	(3.00)	0.10

Panel C: Trading profitability (13-week) across distance quintiles

Distance Rank	Close	2	3	4	Far	Diff
Mean distance (miles)	4.90	27.66	74.99	223.68	462.58	
Purchases	2.85%	4.86%	3.12%	1.45%	0.92%	5.22***
	(0.41%)	(1.49%)	(0.96%)	(-0.23%)	(-0.32%)	3.39***
Sales	-1.96%	-1.56%	-1.81%	-1.09%	-0.63%	-4.52***
	(-2.09%)	(-2.88%)	(-3.13%)	(-1.49%)	(-1.58%)	-3.84***

Table 3
The Effect of Geographic Proximity to the SEC on Insider Trading Frequency

This table reports the multivariate regressions of the trading frequency of insiders on the distance quintile rank and control variables. Panel A reports the descriptive statistics of trading frequencies summarized for purchases and sales, respectively. The summary statistics are also presented for the control variables. Panel B reports the mean coefficient estimates, the time-series t-statistics and the average adjusted R-square from yearly regressions of Equation (1) using the Fama and MacBeth (1973) method. All variables are defined in the text. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

Panel A: Descriptive statistics of firm years with insider purchases or sales

	N	Mean	25%	Median	75%	Std. Dev.
FREQ (Insider purchases)	21,702	2.13	1.00	1.00	2.00	2.50
FREQ (Insider sales)	22,769	2.70	1.00	2.00	3.00	3.42
Distance (miles) (Insider purchases)	21,702	160.70	21.8	82.2	275.00	180.69
Distance (miles) (Insider sales)	22,769	149.38	20.2	51.6	257.00	183.32
Firm_dist (miles)	7,390	161.71	26.00	62.80	276.00	186.70
LnMV ($mil)	29,473	5.71	4.25	5.65	7.06	2.02
BM	29,473	0.58	0.27	0.46	0.74	0.55
Loss	29,473	0.27	0.00	0.00	1.00	0.44
ROA (%)	29,473	-1.68	-1.15	2.42	8.01	21.59
RND	29,473	0.39	0.00	0.00	1.00	0.49
PRE_ABRET (%)	29,473	8.64	-31.90	-2.65	30.91	67.55

Panel B: Multivariate regressions of trading frequency

	Insider purchases		Insider sales	
Rank	0.010***		-0.001	
	(3.40)		(-0.19)	
Ln(*Distance*)		0.009***		0.001
		(3.52)		(0.40)
Ln(*Firm_dist*)	0.012***	0.011***	-0.003	-0.003
	(3.87)	(3.38)	(-0.50)	(-0.65)
LnMV	-0.047***	-0.047***	-0.012**	-0.012**
	(-9.06)	(-9.03)	(-2.73)	(-2.70)
BM	-0.017**	-0.017**	-0.116***	-0.116***
	(-2.45)	(-2.39)	(-7.73)	(-7.71)
Loss	-0.071***	-0.071***	-0.017	-0.016
	(-4.05)	(-4.07)	(-0.86)	(-0.85)
ROA	-0.092**	-0.091**	0.008	0.008
	(-2.74)	(-2.75)	(0.23)	(0.23)
RND	-0.132***	-0.132***	0.039***	0.039***
	(-13.42)	(-13.44)	(5.11)	(5.17)
PRE_ABRET	0.009	0.009	0.041***	0.041***
	(0.96)	(0.95)	(3.77)	(3.76)
Obs.	21,702	21,702	22,769	22,769
Adj. R^2	3.48%	3.49%	1.02%	1.01%

Table 4

The Effect of Geographic Proximity to the SEC on Insider Trading Profitability

This table reports the multivariate regressions of insider trading profitability on insiders' distances to the SEC offices and control variables. Panel A shows the descriptive statistics of insiders' distances and firms' characteristics. Panel B reports the mean coefficient estimates, the time-series t-statistics and the average adjusted R-square from the yearly regressions of Equation (2) for the samples of insider purchases and sales, respectively, following the Fama and MacBeth (1973) method. The distance is measured as either the quintile ranks or the logarithm of driving distances. The trading profitability is the 13-week size-adjusted returns following insider trades. For the sales subsample, we multiply the returns by -1. All variables are defined in the text. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

Panel A: Descriptive statistics of independent variables

	N	Mean	25%	Median	75%	Std. Dev.
Distance (miles)	23,032	161.16	22.60	82.10	271.00	184.20
Firm_dist (miles)	7,390	161.71	26.00	62.80	276.00	186.70
LnMV ($mil)	51,478	5.82	4.36	5.74	7.12	1.98
BM	51,478	0.55	0.25	0.45	0.70	0.45
Loss	51,478	0.24	0.00	0.00	0.00	0.43
ROA (%)	51,478	-0.22	0.04	0.63	2.06	5.57
RND	51,478	0.38	0.00	0.00	1.00	0.49
PRE_ABRET (%)	108,195	0.64	-3.13	0.09	3.67	7.98

Panel B: Multivariate regression analysis

	Insider Purchases		Insider Sales	
Rank	-0.005***		-0.001	
	(-5.58)		(-0.48)	
Ln(*Distance*)		-0.004***		-0.001
		(-4.11)		(-0.67)
Ln(*Firm_dist*)	-0.002	-0.002	-0.002	-0.002
	(-1.00)	(-1.28)	(-1.42)	(-1.43)
LnMV	-0.003	-0.003	-0.002	-0.002
	(-1.55)	(-1.56)	(-0.79)	(-0.81)
BM	0.016**	0.016**	-0.009	-0.009
	(2.67)	(2.65)	(-0.65)	(-0.65)
Loss	0.001	0.001	0.025	0.025
	(0.04)	(0.06)	(1.43)	(1.43)
ROA	0.125	0.125	-0.159**	-0.160**
	(1.29)	(1.29)	(-3.04)	(-3.10)
RND	0.036**	0.036**	-0.005	-0.005
	(2.82)	(2.85)	(-0.31)	(-0.32)
PRE_ABRET	-0.095	-0.094	0.017	0.016
	(-1.79)	(-1.77)	(0.62)	(0.60)
Obs.	46,327	46,327	61,868	61,868
Adj. R^2	3.14%	3.12%	3.83%	3.77%

Table 5
Portfolio Analysis of Insider Trading Profitability

This table reports the portfolio analysis of how insider trading profitability changes with the quintiles (Q_i, i=1, 2, 3, 4 and 5) of insider distance to SEC offices. The trading profitability is measured as the intercept α_p from the following four-factor model:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + \delta_p SMB_t + \sigma_p HML_t + \lambda_p UMD_t + \varepsilon_{p,t}$$

where: $R_{p,t}$ is the portfolio p's weekly return; $R_{f,t}$ is the risk-free rate, measured as the one-week treasury bill rate; $R_{m,t}$ is the market portfolio return, measured using the CRSP value-weighted index; SMB_t is the Fama and French 1993 size factor return; HML_t is the (Fama and French 1993) market-to-book factor return; UMD_t is the Carhart 1997 momentum factor return. To compute $R_{p,t}$, in each calendar week, we form a portfolio by including all firms in which there are insider trades with corresponding transaction type (purchase or sale) in the previous 13 weeks. The portfolio return is then computed as a weighted average of the weekly stock returns of firms included in the portfolio, using the number of trades in each firm as weight. The return window is weekly and the factor loadings are estimated using a time-series regression based on 574 weeks of data, from June 29, 1996 to June 23, 2007. The *t*-statistics are reported in *italics* next to the coefficient estimates.

		Abnormal Returns (%)	
		α	***t-stat***
Buy	Q1	0.446	*8.04*
	Q2	0.588	*10.35*
	Q3	0.502	*9.70*
	Q4	0.320	*7.06*
	Q5	0.289	*7.39*
	Q1-Q5	**0.156**	***2.92***
Sell	Q1	-0.045	*-0.89*
	Q2	0.030	*0.58*
	Q3	0.010	*0.20*
	Q4	-0.046	*-1.10*
	Q5	0.018	*0.42*
	Q1-Q5	**-0.062**	***-1.07***
Buy-Sell	Q1	0.490	*7.09*
	Q2	0.558	*7.54*
	Q3	0.492	*7.02*
	Q4	0.367	*6.57*
	Q5	0.272	*5.19*
	Q1-Q5	**0.218**	***2.88***

Table 6
Insider Purchases' Profitability around M&A Cases and Earnings Announcements

This table reports the multivariate regressions of insider purchases' profitability on the insiders' distance to the SEC offices, conditioning on the trading periods around the time of M&A and earnings announcements. We present the mean coefficient estimates, the time-series t-statistics and the average adjusted R-square from the yearly regressions by following the Fama and MacBeth (1973) method. *EventDummy*=1 for insider trades occurring in the period of six months before and after M&A announcements (9,608 purchases) or in the period of three weeks before and after earnings announcements (22,378 purchases); and 0 otherwise. All other variables are defined in the text. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

$$RET_{i,j,t} = \beta_0+\beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t}))+\beta_2(Rank_j \text{ or } Ln(Distance_{i,j,t}))*EventDummy+\beta_3 EventDummy$$
$$+\beta_4 Ln(Firm\_dist_i)+\beta_5(LnMV_{i,t})+\beta_6(BM_{i,t})+\beta_7(Loss_{i,t})+\beta_8(ROA_{i,t})+\beta_9(RND_{i,t})+\beta_{10}(PRE\_ABRET_{i,t})+\varepsilon$$

	EventDummy=1 for trades around M&A cases		*EventDummy*=1 for trades around Earnings Announcements	
Rank	-0.007***		-0.007***	
	(-6.10)		(-5.31)	
*Rank*EventDummy*	0.010***		0.004**	
	(4.08)		(2.40)	
Ln(*Distance*)		-0.005***		-0.006***
		(-4.95)		(-4.82)
Ln(*Distance*)*EventDum*		0.009***		0.004**
		(3.90)		(2.76)
EventDummy	-0.010	-0.025**	-0.012**	-0.021***
	(-1.65)	(-2.89)	(-2.29)	(-3.11)
Log(*Firm_dist*)	-0.002	-0.002	-0.002	-0.002
	(-0.97)	(-1.23)	(-0.89)	(-1.15)
LnMV	-0.003*	-0.003*	-0.003	-0.003
	(-1.81)	(-1.83)	(-1.47)	(-1.48)
BM	0.017**	0.017**	0.017**	0.017**
	(2.72)	(2.70)	(2.81)	(2.79)
Loss	0.000	0.001	-0.001	-0.000
	(0.02)	(0.04)	(-0.04)	(-0.02)
ROA	0.125	0.126	0.113	0.113
	(1.29)	(1.29)	(1.16)	(1.16)
RND	0.036**	0.036**	0.036**	0.036**
	(2.83)	(2.87)	(2.86)	(2.88)
PRE_ABRET	-0.096*	-0.095	-0.095*	-0.095
	(-1.81)	(-1.79)	(-1.80)	(-1.79)
Obs.	46,327	46,327	46,327	46,327
Adj. R^2	3.24%	3.22%	3.17%	3.15%

Table 7
Analysis of Insider Purchases by Urban Insiders

This table reports the regressions of insider trading frequency and profitability on insiders' distance to SEC offices, using the subsample of urban insiders' purchases. We present the mean coefficient estimates, the time-series t-statistics and the average adjusted R-square from annual regressions of Eq. (1) for the trading frequency test and Eq. (2) for the trading profitability test, based on the Fama and MacBeth (1973) method. All variables are defined in the appendix. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

$$Ln(FREQ_{i,j,t}) = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t})) + \beta_2 Ln(Firm\_dist_i) + \beta_3(LnMV_{i,t}) + \beta_4(BM_{i,t}) + \beta_5(Loss_{i,t}) + \beta_6(ROA_{i,t}) + \beta_7(RND_{i,t}) + \beta_8(PRE\_ABRET_{i,t}) + \varepsilon \quad (1)$$

$$RET_{i,j,t} = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t})) + \beta_2 Ln(Firm\_dist_i) + \beta_3(LnMV_{i,t}) + \beta_4(BM_{i,t}) + \beta_5(Loss_{i,t}) + \beta_6(ROA_{i,t}) + \beta_7(RND_{i,t}) + \beta_8(PRE\_ABRET_{i,t}) + \varepsilon \quad (2)$$

	$Ln(FREQ_{i,j,t})$		$RET_{i,j,t}$	
Rank	0.019***		-0.003**	
	(4.78)		(-3.00)	
Ln(*Distance*)		0.016***		-0.002**
		(4.46)		(-2.43)
Ln(Firm_dist)	-0.008	-0.008	-0.002	-0.002
	(-1.69)	(-1.62)	(-0.80)	(-0.94)
LnMV	-0.049***	-0.049***	-0.004*	-0.004*
	(-7.96)	(-7.92)	(-2.01)	(-2.02)
BM	0.001	0.001	0.010	0.010
	(0.11)	(0.14)	(1.30)	(1.29)
Loss	-0.071***	-0.071***	-0.008	-0.008
	(-4.54)	(-4.62)	(-0.60)	(-0.59)
ROA	-0.087**	-0.086***	0.074	0.074
	(-3.07)	(-3.11)	(0.76)	(0.76)
RND	-0.099***	-0.100***	0.035**	0.035**
	(-6.26)	(-6.26)	(2.66)	(2.68)
PRE_ABRET	0.015	0.014	-0.092	-0.092
	(1.59)	(1.58)	(-1.42)	(-1.42)
Obs.	16,002	16,002	31,870	31,870
Adj. R^2	3.43%	3.44%	3.26%	3.25%

Table 8
Analysis of Insider Purchases excluding those by Insiders in LA, NY, and SF Areas

This table reports the regressions of insider trading frequency and profitability on insiders' distance to SEC offices, using the subsample of insiders' purchases excluding those by insiders in the Los Angeles, New York, and San Francisco areas. We present the mean coefficient estimates, the time-series t-statistics and the average adjusted R-square from annual regressions of Eq. (1) for the trading frequency test and Eq. (2) for the trading profitability test based on the Fama and MacBeth (1973) method. All variables are defined in the appendix. *, **, *** denote significance at the .10, .05, and .01 levels, respectively.

$$Log(FREQ_{i,j,t}) = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t}) + \beta_2 Ln(Firm\_dist_i) + \beta_3(LnMV_{i,t}) + \beta_4(BM_{i,t}) + \beta_5(Loss_{i,t}) + \beta_6(ROA_{i,t}) + \beta_7(RND_{i,t}) + \beta_8(PRE\_ABRET_{i,t}) + \varepsilon \quad (1)$$

$$RET_{i,j,t} = \beta_0 + \beta_1(Rank_j \text{ or } Ln(Distance_{i,j,t})) + \beta_2 Ln(Firm\_dist_i) + \beta_3(LnMV_{i,t}) + \beta_4(BM_{i,t}) + \beta_5(Loss_{i,t}) + \beta_6(ROA_{i,t}) + \beta_7(RND_{i,t}) + \beta_8(PRE\_ABRET_{i,t}) + \varepsilon \quad (2)$$

	$Ln(FREQ_{i,j,t})$		$RET_{i,j,t}$	
Rank	0.013***		-0.004**	
	(3.10)		(-2.81)	
Ln(Distance)		0.011**		-0.002*
		(2.71)		(-1.87)
Ln(Firm_dist)	-0.005	-0.004	-0.002	-0.002
	(-0.77)	(-0.73)	(-1.10)	(-1.41)
LnMV	-0.054***	-0.054***	-0.001	-0.001
	(-8.86)	(-8.83)	(-0.37)	(-0.39)
BM	-0.011	-0.012	0.021**	0.021**
	(-0.83)	(-0.84)	(2.64)	(2.61)
Loss	-0.109***	-0.110***	0.002	0.002
	(-4.05)	(-4.02)	(0.12)	(0.13)
ROA	-0.101**	-0.100**	0.101	0.103
	(-2.63)	(-2.62)	(0.79)	(0.81)
RND	-0.139***	-0.140***	0.034**	0.034**
	(-11.55)	(-11.50)	(2.90)	(2.92)
PRE_ABRET	0.011	0.011	-0.107*	-0.106*
	(0.74)	(0.73)	(-2.12)	(-2.11)
Obs.	16,492	16,492	35,360	35,360
Adj. R^2	4.14%	4.15%	3.06%	3.04%