

Can Aggregate Insider Trading Be Trusted to Predict Market Returns?

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Abstract

Results in early studies show that aggregate insider trading activity predicts market returns. However, recent evidence shows that banking CEOs did not sell their firm's ownerships in anticipation to the financial crisis. These results call into question whether the described relationship still exist. On the one hand, risk of litigation resulting from increasing monitoring levels may force officers across all industries to rethink their trading strategies. On the other hand, the lack of association recently observed may be limited to officers in the banking industry. Insider trading activity of banking officers may be affected by officers shared believes that the financial innovations they create shield them from potential disaster. Insider trading activity of banking officers may also be affected by higher risk of litigation resulting from increased scrutiny following the failure of such products and its consequences. To test my predictions I use insider transactions filed with the Securities and Exchange Commission from 1999 to 2010.

1. Introduction

The purpose of this study is to provide new insights into the relationship between aggregate insider trading and future stock returns first reported by Seyhun (1988a) and recently challenged by findings in Fahlenbrach and Stulz (2011). Seyhun (1988a) reports that from 1975 to 1981 aggregate insider trading activity changes according to movements in market returns. In particular, he observes that stock market declines are preceded by insiders increases in stock sales and decreases in stock purchases. He also notes inverse relationships with respect to market increases. To explain the phenomenon, Seyhun (1988a, 1992b) argues and finds evidence that insiders not only act in response to the firm-specific information they possess but also in response to changes in industry- and economy-wide activity that is not yet reflected in security prices. Nevertheless, over the period 2007-2008, Fahlenbrach and Stulz (2011) document no evidence of increased net selling efforts by banking CEOs ahead of the financial crisis. On average, CEOs in their sample lost at least \$30 million and the median CEO lost more than \$5 million. Fahlenbrach and Stulz (2011) findings raise a puzzling question: Is it possible that in recent times the predictive ability of aggregate insider trading activity has diminished?

To answer this question I advance two hypotheses. First, in line with the results in Fahlenbrach and Stulz (2011), I argue that in recent years the predictive ability of aggregate insider trading activity has decreased. Aggregate insider trading activity does not effectively predict market returns due to increased monitoring levels. Monitoring is exercised by the media, investors, regulators and the public at large. Beginning in the 1980s new insider trading laws were passed in an effort to curtail insider trading activity.

Since then, insiders face increasing levels of legal exposure that may, over time, result in lower levels of aggregate strategic trading. Further, since the early 2000s corporate officers experience increasing levels of scrutiny resulting from corporate scandals involving companies such as Enron and Worldcom. In 2002, with the enactment of the Sarbanes-Oxley Act (SOX), the way insiders behave may have changed in response to the new reporting requirements (Brochet, 2010; Li and Zhang, 2006).

A competing hypothesis is that the results in Fahlenbrach and Stulz (2011) are specific to the banking sector. In recent years, bank managers may have developed expectations about the future performance of their firms and of the economy as a whole that are different from expectations held by officers in other industries. At least two reasons can be advanced to explain this situation. First, bank officers may share overconfident views regarding the successfulness and effectiveness of their financial innovations. As a result, it is likely that they would ignore their potential risks and consequences. In addition, the positive views of their products may cause them to neglect negative economy wide factors that officers in other industries may consider relevant to the future performance of their firms. Second, bank officers may also feel insulated from negative externalities because once they recognize the vulnerabilities in their financial products they are the first to actively seek protection against their downside risks.

Lower predictive power in the banking sector may also be caused by a heightened level of litigation exposure felt by the industry following the housing bust of 2007. Since the financial crisis began, the financial sector has been closely scrutinized

by the media and regulators. Corporate officers at other industries may not feel the same pressure. Thus, refraining from strategic trading to a lesser extent.

To carry out this study I collect insider trades from SEC disclosures filed by corporate officers between 1999 and 2010. The sample includes only trades involving open market purchases and sales of common stock. This selection procedure provides a powerful setting to examine the research question because these type of trades are more commonly motivated by information reasons. This setting also enables the evaluation of the results obtained in this study against those obtain in previous research.

The predictive ability of aggregate insider trading is measured empirically by estimating the strength of the relationship between the dollar value of insider trades and future returns. To do so, I construct a model based on Lakonishok and Lee (2001), where the dependent variable is the difference between the monthly return to the market and the treasury bill return. The independent variable under consideration is the aggregate insider trading activity. The factors that are expected to affect the relationship are the industry classification and a variable signaling the change in the legal environment. The model also controls for other important aspects such as the intensity of trading and prior buy-and-hold returns.

The importance of aggregate insider trading cannot be overstated. Many investors do not trade individual stocks. Instead, they invest in mutual funds that are either managed or indexed portfolios that contain many stocks. For them, the trading activity of individual insiders offers low relevance. These investors are likely to be more interested on overall market movements. In addition, stock markets anticipate

developments in the underlying economy and thus have the potential to predict changes in economic conditions that otherwise would not be recognized until too late. Predicting changes in economic conditions could potentially help capital market participants to take corrective actions when markets move in a direction which is not the one desired.

This paper provides the first count of aggregate insider trading activity posterior to the enactment of SOX. As such, it contributes to the literature that evaluates effects of SOX on different aspects of capital market behavior (Brochet, 2010; Li and Zhang, 2006). This paper also provides evidence of how factors not previously documented in the literature affect insider trading success. In particular, prior studies have neglected the analysis of aggregate insider trading at the industry level. An exception is Johnson et al. (2007) who analyze the impact of litigation on stockholder lawsuits using a sample of computer hardware and software firms. They document that with the passage of the Private Securities Litigation Reform Act of 1995 a greater correlation between litigation and abnormal insider selling exist. My study differs from Johnson et al. (2007) in that it uses the banking industry to uncover the importance of aggregate insider trading to the predictability of market returns in response to threats of litigation and industry shared beliefs.

The remainder of this paper is organized as follows. Section 2 discusses prior research related to the association between aggregate insider trading and future market returns. In Section 3 I develop the hypotheses. The methodology is presented in Section 4. Data sources and elimination criteria are reported in Section 5.

2. Background

Historically, insider trades are the focus of extensive scrutiny by investors, lawmakers, the press and the public at large. Insiders deep knowledge about their firms' affairs places them in a unique position that enables them to assess their firms' future performance before it can be done by outside stakeholders. In support of this argument, an extensive body of research presents evidence showing that individual insiders trade strategically (Seyhun and Bradley, 1997; Thevenot, 2012) and earn abnormal returns on their trades (Lakonishok and Lee, 2001). Seyhun (1988a) argues that insiders trade not only in response to firm-specific information, but also based on industry-wide and economy-wide factors that they perceive could affect their firms' security returns. Thus, a positive association should also be expected between aggregate insider trading and future market returns.

The association between aggregate insider trading and future market returns can be explained on two grounds: impact of economy-wide activity on firms' cash flows and stock price deviations from fundamentals (Seyhun, 1992b). If insiders possess more information about their firms than do other market participants they can observe and trade on the basis of unanticipated changes in their firms' cash flows before outside shareholders. To the extent that these changes are caused by future fluctuations in economy-wide activity, insiders across all firms will recognize the influence of these fluctuations in their own firms' cash flows. If insiders trade on the basis of their observations, then the relation between aggregate insider trading and future excess market returns is expected to be positive. Subsequently, as changes in economy-wide cash flows become recognized by all other market participants, stock prices of firms will tend to adjust converging to prior insiders expectations.

The predictive ability of stock returns by aggregate insider trading can also be explained by deviations from fundamental values. In this scenario, it is implicit that insiders are knowledgeable about the fundamentals and they are aware that current prices differ from them. If the mispricing is widespread, aggregate insider trading will predict future market returns. When current prices are too low, insiders will buy stock. When current prices are too high, insiders will sell stock.

Results in previous studies are consistent with these predictions. Seyhun (1988a) shows that over the period 1975-1981 an increase in current aggregate insiders' purchases is associated with an increase in future excess return to the market portfolio 2 months later. Insiders tend to decrease their stock purchases and increase their stock sales following an increase in the stock market returns, and they tend to increase their stock purchases following market decreases. In a related study, Seyhun (1992b) finds that over the period 1975-1989 aggregating the net number of transactions by insiders over 12 months contributes to predict 25 percent of the variations in 6-month stock returns horizons and 60 percent of the variations in horizons including 12 months. Similarly, Seyhun (1990) examines insider trading activity around the market crash of 1987 and finds evidence suggesting that insider trading activity prior the crash did not help predict expected excess market returns during and after the crash. In fact, the results show no increase in net insider selling activity immediately before the crash but heavy insider purchasing activity during and after the crash. Seyhun (1990) concludes that overreaction, as opposed to fundamental changes in future economic activity, was an important factor affecting the stock price behavior during the crash. Had shifts in fundamentals been a factor contributing to the crash insider trading behavior would

have been different. In the period leading to the crash and during the crash insiders would have intensified selling of their firms' stock and restrained from purchasing.

More recently, Lakonishok and Lee (2001) use a sample of insider trades from 1975 to 1995 to document, that the predictive power of aggregate insider trading activity is increasing in the length of the horizon to be predicted. Indeed, whereas aggregate insider trading has little explanatory power predicting short term horizons (three-month period) it seems to predict market returns for up to 12-month horizons. These authors also caution that results in previous studies have overstated the significance of similar results. Previous insider trading studies did not adjust for a simple contrarian strategy. Controlling for this factor and adjusting for the autocorrelation induced by the use of overlapping periods, economically significant coefficients become marginally statistically significant. As in previous studies, significance is inversely related to firm size.

In spite of the results cited in the previous discussion, Fahlenbrach and Stulz (2011) find that CEOs at banking institutions did not trade out of their positions in anticipation to the recent credit crisis. This situation is at odds with the results in previous studies for two reasons. First, the recent economic crisis was driven by a change in fundamentals. Expectations about the economic activity in the U.S. and abroad was downward revised. The persistence of the revision has been so pervasive that its effects are still being felt 4 years later. Second, at the end of 2006, the median CEO stock and options portfolio was more than eight times the value of his total compensation. Thus, changes in his bank's stock price could easily wipe out all of his annual compensation. If CEOs anticipated the impact of the crisis, they could have avoided the cost of their exposure by decreasing their holdings before the impact of the

crisis could be perceived. However, Fahlenbrach and Stulz (2011) find no evidence of such behavior. Their results indicate that bank CEOs suffered important losses. Overall, estimates indicate that on average bank CEOs lost north of \$30 million and that the median CEO lost at least \$5 million.

3. Hypothesis Development

Although insiders face incentives to trade based on inside knowledge, this activity can impose considerable costs. Congress and the Securities and Exchange Commission seem to share the view that market participants' trust and confidence stems from a belief that the government actively and relentlessly pursues its mandate to maintain the fairness and integrity in the stock market (Newkirk, 1998) by curbing insider trading illegal activity. However, one of the most elusive problems in curbing insider trading abuses has been finding an effective means of deterrence. Accordingly, in the 1980s, in an effort to rectify the ineffectiveness of enforcement remedies available to the SEC for insider trading violations, Congress enacted the Insider Trading Sanctions Act of 1984 (ITSA). ITSA was designed to impose a severe monetary civil penalty as the primary means of deterring future violations of insider trading. In particular, ITSA allowed the SEC to seek a civil penalty of up to three times the insider's profit gained or loss avoided and raised maximum criminal fines from \$10,000 to \$100,000. ITSA also protected a firm from treble damage liability if an employee accused of violating insider trading law did not act on behalf of the firm.

Soon after the passage of the ITSA and following the SEC's civil cases and the United States Department of Justice's criminal cases against Michael Milken and Ivan Boesky, insider trading regulation intensified. In 1988, Congress passed the Insider

Trading and Securities Fraud Enforcement Act (ITSFEA). This Act augmented the law through measures aimed to provide greater deterrence, detection and punishment of violations of insider trading law. Specifically, ITSFEA increased maximum criminal fines to \$1,000,000 for individuals, raised the maximum jail term from 5 to 10 years, and required that firms actively set up procedures to prevent insider trading by the firm or its employees.

Contrary to expectations, stronger federal enforcement and penalties in the 1980s did not prove to be a successful mechanism for insiders to reconsider their trading activities (Jagolinzer and Roulstone, 2007). Further, Seyhun (1992a) reports that, compared to the period before 1980, the overall trend in insider trading activity and profits increased following the new statutory sanctions.

Insiders may have change their attitudes towards trading their own firm stocks with the passage of the Private Securities Litigation Reform Act of 1995 (PSLRA). This Act, whose purpose was to discourage frivolous suits, seems to have diverted the attention of plaintiffs from forward-looking optimistic statements that did not materialized onto objective evidence that the firm and its managers acted with fraudulent intent to mislead investors. As such, the PSLRA caused a greater correlation between lawsuit filings and abnormal insider selling activity. In all, the PSLRA increased the importance of insider trading to explain the frequency, type of allegations, and resolution of securities fraud class actions (Johnson et al., 2007).

Evolving and increasingly stringent insider penalty laws may explain in part why by the end of 1996 most companies surveyed in Bettis et al. (2000) have formal policies restricting insider trading activity. In contrast, by the end of 1990 only a fraction of

companies have codes of conduct that explicitly caution against insider trading (Seyhun, 1992a). Whether intended to avoid legal and regulatory exposure or other potential costs, the blackout periods cited by Bettis et al. (2000) have made corporate insiders more cautious and insider trading activity more difficult. These authors report that the single most common policy implemented prohibits insider trading at all times except for the period involving three to 12 trading days after the quarterly earnings announcement. They also report that corporate trading prohibitions in the form of blackout periods cause a reduction in insider trading profit and activity. Similar observations are made by Jagolinzer et al. (2010) and Huddart et al. (2007). Information-motivated trading is substantially reduced when insider trading restrictions are enforced by a companies' general counsel. The trading pattern observed at the end of the 1990s and beginning of the 2000s is consistent with the interpretation that insiders trade to avoid risks stemming from jeopardies established by past regulatory actions, shareholder class-action suits, and adverse publicity.

The early 2000s was marked by a wake of corporate scandals affecting companies such as Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom, among others. These cases heightened the liability exposure of corporate officers. Increased scrutiny from investors, media and regulators resulted in the enactment of the Sarbanes-Oxley Act of 2002 (SOX). Several authors have documented that after the passage of SOX management's incentives and opportunities to engage in opportunistic behavior have decreased relative to the pre-SOX era. For example, Heron and Lie (2007) document stock return patterns around option grants that are less favorable to managers and Cohen et al. (2008) find a decrease in accrual-

based earnings management. Following these results, Brochet (2010) find a reduction of insider trading activity motivated by private information, and Li and Zhang (2007) report post-SOX decrease in opportunistic insider selling ahead of accounting restatement announcements.

Collectively, the preceding discussion suggests that the predictability of market returns by aggregate insider trading may be diminishing over time in response to a greater exposure level and, thus, risk of litigation. Therefore, I hypothesize:

H1: The predictability of market returns by aggregate insider trading activity is smaller following the enactment of SOX.

An alternative explanation to the results found in Fahlenbrach and Stulz (2011) is that the observed behavior in banking CEOs is exclusive to the financial sector. Thus, following the passage of SOX insider trading activity in the banking industry may have become less predictive of market returns when compared to other industries. This could happen if, for example, bank managers had expectations about the future performance of their banks and of the economy that differ from those held by managers at other industries. It could also occur if financial institutions faced stronger scrutiny by investors, media, and regulators that could lead to higher litigation exposure.

There are two potential non mutually exclusive reasons to justify why banking officers may have different expectations about the performance of their firms and of the economy as a whole. First, banking officers may share excessive confidence in their financial innovations. In turn, overconfidence not only may preclude banks from proper

identification and assessment of the risks inherent in the products they develop but also from negative news permeating into the models they use to forecast performance.

Second, if banking officers become aware that the products they have developed are flawed banks may be the first to actively seek protection against downside risks.

Financial innovations are intended to satisfy investors excess demand for low risk cash flows not met by currently available traditional securities. In response to demand, incremental changes to existing and often more risky securities result in new securities perceived to be safe substitutes for the old ones (Gennaioli et al., 2010). As such, these securities are mass produced and become an important source of revenue for the issuers. The success pushes banks to become heavily invested in their new business, likely ignoring its potential risks and their consequences. Further, excessive confidence in their financial innovations may preclude banks from allowing negative news to permeate into the models they use to forecast performance. Banks may neglect the consideration of external factors because the products they develop are perceived to protect them against the related risks by means of diversification, slicing, and insuring. This situation places banks at a disadvantage with respect to other industries. Where at other industries officers may pay close attention to economy-wide factors that can potentially affect their firms' future performance, banks may neglect this evidence in favor of the success of their developed products.

While initially financial innovations are perceived to be safe because the risks embedded in the underlying instruments are transferred from people who do not want it to people who do, their inherent risks are not always readily understood by investors and financial innovators alike (The Economist, 2012). As time passes, experience

matures, and new information related to the performance of the new securities becomes available, it is likely that banks are the first to recognize the vulnerabilities posed by the previously unrecognized risks. Then, banks attempt to protect themselves from the downside risks while still enjoying the upside potential. Banks cultivate a false perception regarding their future economic performance and neglect the impact of the newly discovered risks on the economy as a whole.

Signs of this development process can be observed in the financial environment of recent years, suggesting that aggregate insider trading activity by banking officers could not anticipate market returns. Beginning during the Clinton administration, a reduction in government debt and a massive demand for safe US assets by foreigners, created a shortage of safe bonds (Gennaioli et al., 2010). By pooling and tranching mortgages and other loans, financial institutions engineered AAA-rated Residential Mortgage Backed Securities (RMBS) and Collateralized Debt Obligations (CDO). Banks sold RMBS and CDO securities to investors around the world, and helped develop a secondary market where RMBS and CDO securities could be traded. Banks also developed standardized credit default swaps (CDS) and established the ABX index, which allowed counter parties to bet on the rise or fall in the value of a basket of subprime RMBS securities. Thanks to historically low default rates in the US and continuously growing home prices, these complex and high risk financial products were perceived to be safe by investors and creators. From 2004 to 2008, financial institutions issued \$2.5 trillion in RMBS and more than \$1.4 trillion in CDO securities. Banks also draw a substantial source of revenue from these instruments. Investment banks typically charged fees of one to eight million to act as the underwriter of an RMBS

securitization, and five to ten million to act as the placement agent for a CDO securitization (Wall Street and the Financial Crisis, 2011).

Concurrently, news were spreading about a potential housing bust followed by a strong recession. Results of studies published between 2003 and 2005 document how large housing price movements affect households' net wealth and capacity to borrow and spend, influencing aggregate demand and consumption (Terrones, 2005) as well as economic output growth (Helbling and Terrones, 2003; Helbling, 2005). Faulkner-MacDonagh and Mühleisen (2004) present evidence that the strong consumer spending experienced in the United States between 1995 and 2003 reflected increases in housing wealth and mortgage financing. Accordingly, early discussions turned to forecast a housing bust in the United States with dire economic consequences (Shiller 2005a and 2005b; The Economist, 2005). Even anecdotal evidence warned about an economic collapse. In an appearance on CNN on August 9, 2006 Robert Toll, chairman of the company Toll Brothers, indicated that the slump in residential construction he was observing was the biggest he had seen in 40 years. Later, the National Association of Realtors released a report indicating that sales of existing homes had plunged to a two year low and inventories of unsold homes had risen to a 13-year high. Following the report, Nouriel Roubini, president of Roubini Global Economics forecasted a gloomy outlook for the US Economy. He anticipated that the U.S. would be in recession in 2007 (Nutting, 2006).

Then, there was the realization among banks that their products were not as sound as they anticipated. Banks suspecting the mortgage market was deteriorating took out insurance policies against the RMBS and CDO securities they were selling,

allowing them to gamble on the fall in value of their own assets. At Washington Mutual Bank (WaMu), the nation's largest thrift and sixth largest bank, high risk loans began incurring high rates of delinquency and default in 2006. By the second half of the year, concerns among WaMu executives regarding the bank exposure to adjustable rate mortgages (ARM) was evident. Executives recognized that the low performing ARM loans needed to be sold before they became delinquent and WaMu lost the opportunity to sell them. Similar situations arise at other financial institutions. For example, at the beginning of 2007, Goldman Sachs sold off or wrote down the bulk of its existing subprime RMBS and CDO inventory. It also began building a short position that allowed the bank to profit from the decline of the mortgage market. Goldman sold RMBS and CDO securities to its clients without disclosing its own net short position against the subprime market. Further, Greg Lippmann, Deutsche Bank's top CDO trader, repeatedly advised his colleagues and a selected group of his clients seeking to buy short positions about the poor quality of the residential RMBS underlying many CDOs (Wall Street and the Financial Crisis, 2011).

Faced with such skewed incentives, banks were willing to place big bets and ignore evidence against the success of their newly created products. Nevertheless, by 2008, Lehman Brothers had declared bankruptcy, Bear Stearns and Washington Mutual have been sold to JP Morgan Chase, and Countrywide Financial and Merrill Lynch had to be rescued by Bank of America.

Once other market participants realized the products they had been purchasing were flawed, banks' legitimacy was in doubt. Over the period 2007-2008 the media, regulators, and law enforcement agencies heightened banks' potential litigation

exposure by suggesting banks were the culprit of the economic downfall (Steverman and Bogoslaw, 2008). In October of 2008, congress passed a \$700 billion rescue package (Siddique, 2008) targeted to purchase toxic debt from banks. Although the measure was expected to restore faith in lending markets, it exacerbated further the visibility of banks' failure by outraging and appalling american families and politicians alike (Harris et al., 2008). Increased level of negative exposure caused aggregate insider trading activity within the banking industry to have lower predictive power than within other industries. Thus, the second hypothesis is formally stated as follows:

H2: Following the passage of SOX, the predictability of market returns by aggregate insider trading activity is smaller in the banking industry when compared to the predictive ability of aggregate insider trading at other industries.

4. Methodology

The basic model I use to test my hypotheses measures the strength of the association between insider trading activity and future (1-, 3-, 6-, and 12-month) excess market returns. As in previous studies (John and Lang, 1991; Beneish, 1999; Lakonishok and Lee, 2001; Li and Zhang, 2006), the variable under consideration is the insiders' net purchase ratio (NPR). I define NPR as an aggregate ratio in which the total dollar value of insiders' purchases minus the total dollar value of insiders' sales is scaled by the sum of the total dollar value of purchases and sales. NPR is recalculated at the end of each month beginning on June 1999 and ending on December 2010. The

calculation is performed using the trades filed by insiders in the prior 6 months. Similar to the model used in Lakonishok and Lee (2001), I estimate the following regression

$$\prod_{k=t}^{t+T} (1+r_{m,k}) - \prod_{k=t}^{t+T} (1+r_{f,k}) = \alpha_0 + \alpha_1 NPR_{i,k} + \alpha_2 IND + \alpha_3 SOX + \alpha_4 PR24_{i,k} + \alpha_5 INT_{i,k}$$

where $r_{m,k}$ is the CRSP equally-weighted market return in month k and $r_{f,k}$ is the monthly three-month treasury bill rate in month k . $NPR_{i,k}$ represents the net purchase ratio of industry i (banking or otherwise) in month k . IND is a dummy variable that equals one if the observation is made in the banking industry, and zero otherwise. SOX represents the increased level of legislation. It equals one if the observation is made after the passage of the Sarbanes-Oxley Act, and zero otherwise. The variable $PR24_{ik}$ controls for insiders contrarian strategies. It is the prior two-year holding period return of industry i in month k . The intensity of trading activity over the NPR period is given by INT_{ik} . This variable measures the number of companies in a given industry in which insider trading is observed over a given period, scaled by the total number of companies in the same industry.

5. Data and Sample Characteristics

For this study, I obtain insider data from the Securities and Exchange Commission (SEC). In particular, I download trades executed by officers between January 1999 and December 2010. To be included in the sample trades must be reported as open market purchases and sales. All other types of trades (e.g. option grants and exercises as well as shares acquired through compensation plans and

shares traded privately) are excluded from the analysis. This limitation is consistent with a measure of insider trading that is more commonly motivated by information reasons. To capture the most meaningful trades I follow Lakonishok and Lee (2001) and eliminate all firms for which their stock price is less than two dollars at the beginning of the year. I remove transactions whose share price on the trading day is not within 20% of the CRSP highest bid/ask price or closing price. Also removed from the sample are transactions in which the number of shares traded exceeded 20% of the number of shares outstanding. Firms are classified as banks if their 4-digit SIC code falls between 6000 and 6999. This requirement yields 600 unique firms whose primary field of operation is finance, insurance, and real estate.

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