

Insider Sentiment and Market Returns – International Evidence

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Abstract

In this study, I investigate the predictive content of aggregate equity purchases and sales by senior corporate officers and directors in a sample of 39 countries. I find that country-level net purchases by corporate insiders are positively associated with future country-level market returns, controlling for other contemporaneous signals and risk factors. The predictive content of aggregate insider trades is driven by countries with less transparent information environments and, to a lesser extent, lower investor protection. There is also some evidence that insiders trade on foreknowledge of changes in real activity such as future GDP growth. Collectively, the evidence is consistent with corporate insiders around the world trading upon domestic macroeconomic news, and their aggregate trading behavior having greater predictive content in countries where the quality of capital market institutions is relatively lower. The results indicate that regulatory initiatives requiring the timely disclosure of insider trades may provide international investors with useful information for their portfolio allocation.

Keywords: Insider Trading; International Equity Markets; Mandatory Disclosure.

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1. Introduction

Equity transactions by senior officers of public corporations have received a great deal of attention from regulators, investors and scholars in financial economics and law. By virtue of their job function, corporate executives have access to information about future cash flows and discount rates that is not reflected in stock prices. Assuming that their stock purchases and sales are partly reflective of that private information, the public disclosure of those trades can be an informative signal to market participants. There is extensive research documenting the informativeness of insider trades in the U.S., where insider trades have been disclosed since the 1930s. Over the last decade, an increasing number of countries and stock exchanges around the world have been mandating the disclosure of corporate insider transactions and disseminating that information in a timely fashion. Senior officers from companies outside of the U.S. reported transactions of more than \$50 billion worth of stock in their own firm in 2011. Whether those disclosed trades are informative, however, remains a largely unanswered question.

While insiders' private information may be purely firm specific, it can also be correlated with macro factors that affect other companies such as their domestic and industry peers. In that case, the trading behavior of corporate insiders across firms can be informative about aggregate stock returns. This study examines the predictive content of aggregate trading by corporate insiders (hereafter, insider sentiment) in a large sample of equity markets around the world. More specifically, I investigate whether country-level insider sentiment is associated with future country-level stock returns, and which country-level institutional forces affect the predictive content of insider sentiment.¹

¹ Consistent with Howe et al. (2009), I use the term "predictive content" to indicate an association with future stock returns. In contrast, "information content" implicitly refers to a relationship with

Insider trading has been the subject of a perennial debate about fairness versus efficiency in equity markets (Manne 1966; Carlton and Fischel 1983; Ausubel 1990; Leland 1992; Bainbridge 2000). With respect to the efficiency argument, regulators acknowledge that there is demand from investors about the disclosure of equity transactions by corporate insiders.² It remains unclear whether those transactions are at all informative. In particular, insiders are likely to sell their stock in response to liquidity and portfolio rebalancing needs. Accordingly, insider sales have often been found to bear little to no association with subsequent stock returns. This is all the more to be expected when insiders face litigation costs associated with selling ahead of stock price drops. In contrast, stock purchases tend to precede good news on average, although this association varies across countries (Fidrmuc et al. 2012).

While most studies examine the informativeness of insiders' transactions at the firm level, Seyhun (1992a) stands out by documenting a significantly positive association between insiders' net purchasing activity aggregated at the market level and subsequent stock returns, using U.S. data between 1975 and 1989. Aggregating insider trading information across firms may have the benefit of increasing the signal to noise ratio inherent in individual trades, assuming that insiders trade upon knowledge that is not just relevant to their own firm. However, the lack of coordination among insiders across firms in their trading behavior and/or the different relevance of macro news to peers' stocks may render aggregate insider trades' predictive content for aggregate stock returns mute.

contemporaneous returns. However, since I aggregate data per quarter, there is no single "event" date that I can use to infer the market's reaction to insider sentiment.

² For example, the U.S. Securities and Exchange Commission acknowledges that "many investors believe that reports of directors' and executive officers' transactions in company equity securities provide useful information as to management's views of the performance or prospects of the company" (<http://www.sec.gov/rules/final/33-8230.htm>). Likewise, EU regulators state that these reports provide "a highly valuable source of information to investors" (<http://eur-lex.europa.eu/en/index.htm>).

Furthermore, if investors infer insiders' information from the timely disclosure of their trades, contemporaneous returns may already reflect that information. Hence, whether insider sentiment in global markets predicts future stock returns is an empirical question.

Using a dataset of equity transactions compiled in large part by a data vendor (Director Deals) and supplemented by data obtained from individual stock exchanges, I find that insiders' net purchases (i.e., purchases minus sales) aggregated by country and calendar quarter are positively associated with the next country-quarter stock return, controlling for common market-based predictors of future returns (momentum, market-to-book, market size, worldwide market return, liquidity), dividend yield, inflation, and other signals from firm disclosures (earnings guidance), sell-side analysts (forecast revisions), and institutional investors' holdings. Furthermore, when I allow the coefficients to differ on equity purchases and sales, I find a significantly positive (negative) coefficient on purchases (sales). This evidence is consistent with insiders trading upon macroeconomic news at the country level that is not immediately reflected in stock prices.

I further exploit country-level variation in my sample by examining whether insider sentiment has more or less predictive content depending on certain country characteristics. In particular, I focus on institutional properties that are likely to affect corporate insiders' ability to engage in informed trading and the average investor's ability to infer insiders' private information from their disclosed trades. Building on prior work by La Porta et al. (2002), Djankov et al. (2008) and Fidrmuc et al. (2012) among others, I test whether insider sentiment's predictive content varies with country-level shareholder protection against insider trading and self-dealing. I find some evidence that higher

investor protection, as measured by a composite index of rule of law, anti-self-dealing protection and insider trading regulation, decreases insider sentiment's predictive content.

Next, I test whether the information environment affects the association between insider sentiment and future market returns. Based on data from Leuz et al. (2003) and Bhattacharya et al. (2003), I use country-level earnings quality as one proxy for information transparency. I also use the adoption of international financial reporting standards (IFRS) as a proxy for higher information environment quality (e.g., Byard et al. 2010; Horton et al. 2013).³ High earnings quality may reduce the predictive content of insider sentiment if those sources of information are substitutes. Furthermore, if corporate insiders use earnings opacity to obfuscate their private information and increase the profitability of their rent-extracting activities, the market may infer their private information with a delay. However, if earnings quality is positively associated with the quality of other information sources, then insider trade disclosures may have greater predictive content in the presence of high quality earnings. The third measure of the information environment I use is country-level transaction costs (Chan et al. 2005). While investors can observe corporate insider trades in a timely manner in all countries in the sample, they may face a greater hurdle in reacting to the signal embedded in trades from insiders in high transaction-cost countries, which could explain why insider sentiment predicts future market returns. I find that the association between insider sentiment and subsequent quarter market returns is significantly higher in countries with lower

³ I do not necessarily imply that IFRS adoption per se increases the quality of financial reports. Rather, I rely on existing studies' conclusions suggesting that the information environment tends to improve around IFRS adoption, at least for some countries, i.e., those with stronger enforcement mechanisms, and some firms, i.e., those with incentives for transparent reporting incentives. The appeal of mandatory IFRS adoption in my setting is that it is a choice variable at the country-level, and that it is not strictly time invariant.

transparency, as measured by a combination of the three proxies above. Hence, the results suggest that insider sentiment has less predictive content in countries with stronger capital-market institutions. This is consistent with two non-mutually exclusive interpretations: Corporate insiders are more likely to trade on macroeconomic information in countries with weaker institutions, and prices are more likely to reflect their private information more quickly and through other channels in countries with stronger institutions.

Lastly, prior research has shown that U.S. insiders may trade on private knowledge of future cash flows or perceived mispricing about their own firm (Rozeff and Zaman 1988; Jenter 2005; Piotroski and Roulstone 2005) or in aggregate (Jiang and Zaman 2010). To shed light on this issue in a cross-country setting, I test whether insider sentiment predicts future changes in real activity, measured by growth in GDP and changes in aggregate corporate earnings. I find some evidence that country-level quarterly insider sentiment predicts growth in GDP over the following six months. However, I do not find any evidence of insider sentiment predicting changes in aggregate earnings. Overall, though, it is likely that the predictive ability of insider sentiment for market returns is a function of both insiders' foreknowledge of fundamentals and market timing ability.

This paper contributes to the literature on insider trading informativeness. To my knowledge, this is the one of the very first cross-country studies of insider trading. Fidrmuc et al. (2012) find—using data from 15 European countries and the U.S. —that insider purchases (sales) are more (less) informative in countries with greater shareholder protection. While Fidrmuc et al. (2012) examine firm-level stock returns, I document that

country-level insider purchases and sales can be informative in Europe and other parts of the world. I extend the work of Seyhun (1988, 1992a) by showing that aggregate insider trading is informative outside of the U.S. I also exploit the cross-country variation in institutions in my sample to document the effect of capital-market institutions on the predictive ability of insider sentiment for market returns, thereby offering insights beyond evidence based on within-country time-series inquiries (e.g., Seyhun 1992b; Garfinkel 1997). The results may be informative to scholars who examine the dissemination of information in global capital markets, to investors who wish to take insider transactions into account as part of their portfolio allocation, and to regulators who are considering further amendments to the insider trading laws that apply in their jurisdictions.

The rest of the paper is organized as follows. In the next section, I review the prior literature and provide a summary of the relevant institutional background on insider trading regulation. In section three, I describe the data and empirical measures, and present some summary statistics. I present the main results in section four. Section five concludes.

2. Institutional Background and Literature

In this section, I offer a brief overview of insider trading regulation and reporting requirements around the world, and a literature review on the informativeness of equity transactions by corporate officers in the U.S. and other countries.

2.1. Insider Trading Restrictions and Mandatory Disclosure

While it is beyond the scope of this paper to delve into the details of securities regulation pertaining to insider trading around the globe, a primer on the key

developments that have made it possible and relevant to conduct the empirical analysis reported in this study is helpful in understanding the underlying motivation. There are two major tenets of insider trading regulation in capital markets. The first one is that individuals should not trade on the basis of material and non-public information. While this restriction is not limited to senior officers of publicly listed corporations, they represent a primary target for insider trading regulation. This is due to their privileged access to private information – some of which directly results from their own decision-making prerogatives – and their fiduciary duty towards the firm’s shareholders. The U.S. first restricted insider trading as part of the Securities Exchange Act of 1934. Other countries followed suit decades later, with many instituting insider trading restrictions in the 1990s (Bhattacharya and Daouk 2002). All countries in my sample have laws in place restricting trading on private information.

The second pillar of insider trading regulation is the reporting requirements that corporate insiders are subject to. Again, the U.S. pioneered mandatory disclosure of insider transactions by senior executives and directors of publicly listed corporations, and those of major shareholders (holding 10% or more of a company’s stock) under the Exchange Act of 1934. Until 2002, U.S. insiders were required to file their trades with the Securities and Exchange Commission on a monthly basis. Following Section 403 of the Sarbanes-Oxley Act (SOX), trades must now be filed within two business days. In Canada, Ontario securities regulation first required the reporting of insider transactions in 1966. In 2010, Canada also amended its initial requirement by shortening the allowed disclosure delay from ten to five days, partly in response to concerns regarding stock option backdating (Compton et al. 2011). In the U.K., listed companies have been

required to notify the London Stock Exchange of equity transactions by their directors and officers since 1976 (Pope et al. 1990). While some countries in continental Europe had also mandated the disclosure of corporate insider transactions before then, the adoption of the Market Abuse Directive (2003/6/EC) from 2005 onwards harmonized the disclosure requirements across member states by mandating disclosure of transactions within five working days (2004/72/EC). While still under British administration, Hong Kong also adopted insider trading laws in 1991, including a mandate for corporate insiders to disclose their trades to the Stock Exchange of Hong Kong within five business days. In 2003, the disclosure delay was shortened to three days (Leung et al. 2009). As is evident from this short list of examples, adoption dates of disclosure requirements of corporate insider trades vary significantly. To date, many stock exchanges still do not require the disclosure of those trades. However, even for jurisdictions where reporting requirements had been in place for decades, the early 2000s brought about regulatory impetus and technological changes that have facilitated the timely dissemination of those trade disclosures. Indeed, regulators not only feel compelled to respond to investor demand for information about insider trades (recall footnote 1), but also view prompter disclosure requirements as a mechanism to further discourage trading on material private information (Compton et al. 2011). Using the change of disclosure rule brought about by Section 403 of SOX to test the effect of more timely disclosure, Brochet (2010) documents a significant increase in the information content of insider trade disclosure attributable to the reduction in the allowed disclosure delay and the immediate dissemination of that information on the SEC's and issuers' websites. Hence, insider trade disclosures are now made publicly available on a timely basis by a large number of

stock exchanges and securities regulating agencies around the world, which provides potentially useful information to investors.

2.2. Literature on the Informativeness of Insider Trading

There is a vast literature examining the information content of corporate insider trades, a comprehensive review of which is also beyond the scope of this paper. Consistent with the longer history of insider trade disclosures in the U.S., a large majority of corporate insider trading studies have focused on U.S. data. The earliest study I am aware of is Smith (1940), who examines the market timing of insider purchases and sales during the 1935-1939 period. Smith concludes that “insiders as a group did not consistently sell at high prices and buy at low prices ... and the averages indicate that on the whole insiders did not make exceptional trading profits.” Later studies generally conclude that corporate insider trades precede significant abnormal returns (Lorie and Niederhoffer 1968; Jaffe 1974; Finnerty 1976; Seyhun 1986), suggesting that U.S. insiders are able to identify mispricing in their own firms’ stock and trade on the basis of that information. While the aforementioned papers assess the informativeness of insider trades using time windows of varying lengths (from a few days to a year), Lakonishok and Lee (2001) conclude that short-window returns around insider trade disclosures are of modest magnitude, which Brochet (2010) attributes to the lack of timeliness of pre-SOX disclosure requirements.

Numerous studies also examine the information content of corporate insider trades outside of the U.S. Pope et al. (1990) find that U.K. insider dealings are, on average, informative. Fidrmuc et al. (2006) also reach that conclusion, using short-window returns to assess the informativeness of U.K. insider trade reports. Other single-

country studies tend to find similar evidence using European data, such as Del Brio et al. (2002) in Spain, Betzer and Theissen (2007) in Germany, Zingg et al. (2007) in Switzerland, and Degryse et al. (2009) in the Netherlands. In contrast, Eckbo and Smith (1998) find no evidence that insiders trade profitably in Norway. Furthermore, the results in the previous studies tend to be attributable to certain subsets of firms, insiders or transactions. Indeed, purchases by executives from small firms tend to be the most informative. Outside of Europe, similar evidence has been documented. For example, Wong et al. (2000) find that insiders of smaller firms in Hong Kong earn abnormal returns on their trades, while insiders of medium-sized and large firms do not. Furthermore, similar to Del Brio et al. (2002) in Spain, Wong et al. (2000) find that outsiders cannot profitably mimic insiders' trades using their disclosures. Studies find mixed evidence in Australia. While Brown et al. (2003) document that a majority of Australian insiders' purchases do not precede positive abnormal returns, Hotson et al. (2008) find that officers of small firms trade profitably, on average. Most recently, Budsaratragoon et al. (2012) find that insiders of Thai firms earn abnormal returns on their trades. Collectively, those studies show that, controlling for cross-sectional determinants such as firm size, transaction type and volume, one can find significant patterns of corporate insider trades and disclosures thereof preceding firm-level abnormal returns.

2.3. Predictive Content of Insider Sentiment

I attempt to innovate above and beyond this stream of literature along two dimensions. First, few studies exploit cross-country variation in the informativeness of insider trades. Fidrmuc et al. (2012) show that, in a sample of fifteen European countries

plus the U.S., insider purchases (sales) exhibit greater (lower) information content in countries with stronger shareholder protection. They interpret this as evidence of stronger country-level institutions affecting the informativeness of insider trades through a better disclosure environment (hence the effect on director purchases) and a greater mitigating effect on insiders' ability to profit from their information advantage (hence the effect on director sales). Of note, average long-window returns following insider purchases are insignificantly different from zero in 6 countries in their sample, while univariate results indicate no informed selling on average. Hence, Fidrmuc et al. (2012) show that country-level institutions matter in explaining firm-level abnormal returns following insider transactions, and not all countries appear to have corporate insiders who trade in such a way that their transactions convey firm-level information to investors.

However, corporate insider trades need not be a useful signal only at the firm level. Using U.S. data, Seyhun (1988, 1992a) shows that aggregate information about insider transactions successfully explains market-level returns in the near future. This is consistent with insiders collectively trading on macro-economic information that is not reflected in stock prices by the time their trades are publicly disclosed by the SEC. Given the increasing availability of corporate insider trading data around the world, it follows that a question of interest to investors is whether, similarly, aggregate insider purchases and sales are informative about aggregate stock returns outside of the U.S. While the logic is the same as for U.S. insiders, there are many reasons that the answer to that question is far from obvious *ex ante*. First, all of the previously mentioned studies on non-U.S. insider trading informativeness suggest that foreign insiders trade on private information about their own firm rather than their industry or country. Second, the results

tend to be driven by smaller firms, whereas it seems more intuitive that trades by insiders from larger “bellwether” firms would be informative about market returns. Furthermore, if investors infer all the information from the aggregate trading signal once all trades have been disclosed, then contemporaneous stock returns should already reflect insiders’ private information, and the association between insider trades and future returns will be mute. Lastly, a variety of factors such as market institutions, the reliance on equity compensation and other cultural differences across countries may be such that corporate insider trading patterns are too noisy for outsiders to distill informative signals out of their time-series and cross-sectional behavior. Hence, whether aggregate corporate insider transactions outside of the U.S. are informative is an empirical question.

2.4. Country Characteristics and the Predictive Content of Insider Sentiment

The extent to which corporate insider trades have predictive content is likely to vary based on country characteristics such as the quality of institutions in place and stock market development (Doidge et al. 2007). I appeal to an extensive literature on investor protection and countries’ information environment and relate it to the institutional characteristics of insider trading disclosure to develop predictions on cross-country determinants of the predictive content of insider sentiment.

2.4.1. Shareholder Protection and the Predictive Content of Insider Sentiment

Fidrmuc et al. (2012) document a positive association between the level of shareholder protection and the market reaction to insider purchase disclosures across European countries. They interpret this result as evidence that shareholder protection enhances the transparency and trustworthiness of corporate insider actions, which leads to information being impounded more efficiently into stock price following disclosures such

as insider purchases, just as it does for more prominent disclosures such as earnings announcements (DeFond et al. 2007). If the association between *aggregate* insider trading and stock prices is likewise affected by institutions that enhance outsiders' ability to consider disclosed insider trades as an informative signal, then the association between aggregate insider trading and market returns should likewise be more pronounced in countries with stronger institutions.

Furthermore, firms in countries with greater shareholder protection are also likely to rely more heavily on equity-based executive compensation as a way to align shareholder and managerial incentives (Bebchuk et al. 2002). In that case, insider trades are more likely to be frequent and informative. Indeed, if corporate insiders' wealth depends more on stock-based compensation, their utility is more sensitive to the timing of their stock purchases and sales. While the expected penalties associated with trading ahead of privately known material news are higher in countries with greater shareholder protection, I assume that insiders are less likely to be prosecuted if they trade on macro-economic information, because they can more easily claim that outsiders were just as likely to know about that information. Accordingly, this argument also leads to greater informativeness of aggregate insider trades in countries with high shareholder protection. However, the logic thus far suggests that shareholder protection enhances short-window reactions to disclosures. Hence, an alternative hypothesis would be that aggregate insider sentiment is more strongly associated with *contemporaneous* rather than future market returns.

Shareholder protection may, however, have a negative impact on the predictive content of corporate insider trades. Indeed, if corporate insiders face lower penalties for

rent extraction in countries where investors have fewer chances to have them prosecuted, they may trade more profitably, i.e. buy (sell) shares ahead of material non-public positive (negative) news. If that behavior is pervasive at the country-level, and/or if they trade on non-firm specific news, insider sentiment will have more predictive content in countries with lower shareholder protection. Since prior studies find a negative association between investor protection and stock price synchronicity (Morck et al. 2000), insider transactions are all the more likely to have predictive content in aggregate in a more synchronous market. All in all, because of the competing predictions regarding the effect of shareholder protection on the informativeness of corporate insider transactions, I formulate the following hypothesis in its null form:

H1: The predictive content of aggregate insider sentiment does not vary with country-level shareholder protection.

2.4.2. Information Environment and the Predictive Content of Insider Sentiment

Although not independent from shareholder protection, characteristics of the information environment may also affect the degree to which corporate insider transactions predict future market returns. Disclosed insider transactions are part of a broader set of mandated and voluntary disclosures. Prior research has shown that corporate insiders strategically time their trades vis-à-vis mandated and voluntary disclosures. Using within-U.S. firm-level evidence, Beneish and Vargus (2002) find that insider trading activity is associated with the quality of reported accruals. More specifically, they document a positive association between the persistence of income-increasing accruals and net insider purchases, and find that a trading strategy that incorporates information about accruals and insider transactions earns significantly

higher returns than one based on accruals alone. This evidence suggests that U.S. insiders time their trades strategically based on the quality of current earnings. Other studies also find that insiders' trading incentives affect their voluntary disclosure choices (e.g., Noe 1999; Rogers 2008). Conversely, Brochet et al. (2013) document a decrease in corporate insider trading profits following IFRS adoption in the U.K. This suggests that a country-level change in the quality of the financial reporting system can mitigate the association between insider trading and future returns. By extending the reasoning to a cross-country setting, I expect that earnings quality at the country level affects the informativeness of corporate insider trading.

If financial reporting is of higher quality in a given country, outsiders can more readily react to public disclosures such as earnings announcements, leaving less room for (i) corporate insiders to profit from their private information and (ii) more ambiguous disclosures such as insider transactions to be price-relevant. Furthermore, if insiders 'camouflage' their private information by manipulating financial reports through earnings management, the market may infer their informed trading with a delay, which will lead to a positive association between corporate insider trading and future returns in countries where earnings management is more prevalent, i.e., where financial reporting is of lower quality. This is all the more likely since earnings management is more widespread in countries with low investor protection (Leuz et al. 2003). The above hypotheses imply that both information and agency frictions can lead to a negative association between financial reporting quality and the predictive content of insider sentiment.

There are, however, reasons to expect an opposite effect. If financial reporting quality is positively correlated with the quality of other disclosures, including those of

insider transactions, then it may enhance the informativeness of insider trade disclosures. This is the main interpretation that Fidrmuc et al. (2012) propose for the greater information content of insider purchases in countries with greater shareholder protection that they document. However, the logic need not follow when looking at aggregate insider transactions. This is so because stock prices are less likely to reflect firm-idiosyncratic information in countries with poorer information environments (Jin and Myers 2006). Consequently, insider transactions may have greater predictive content *in aggregate* when financial reporting quality is poor.

Lastly, transaction costs are also likely to affect the association between aggregate insider trading and market returns. The timeliness of insider transaction disclosures enables market participants to observe those trades within days. Accordingly, they should be able to react promptly to the trades. However, in countries with higher transaction costs, outsiders may find it too costly to arbitrage away any perceived mispricing based on insider trading signals.⁴ Consequently, holding insiders' proclivity to trade on macro information constant, I expect the association between current aggregate insider trading and future market returns to be higher in countries with high transaction costs because of a delayed market reaction to the signal embedded in insider trades.

In sum, I formulate my second hypothesis as follows:

H2: Aggregate insider sentiment has more predictive content in countries with lower information transparency, as measured by financial reporting quality and transactions costs.

⁴ While transaction costs affect market participants' ability to arbitrage away misvaluation based on other signals as well, the noise inherent to insider trade disclosures is such that the expected benefit from processing and trading on that information alone is lower than that of trading on other more explicit signals such as analyst forecasts or earnings-related disclosures.

3. Sample Selection and Research Design

3.1. Sample Selection

I obtain insider transaction data from several sources. I use Thomson Reuters' Insider Filing Data Feed for U.S. data. The primary source for non-U.S. insider transactions is Director Deals, a data vendor that collects data from stock exchanges and formats it in a way that is consistent across countries. The main information available for a given transaction is the name of the insider, his or her position in the firm, the transaction type (e.g., purchase, sale, option exercise, option grant, etc.), the number of shares transacted and the average transaction price, the total trade value (in British Pounds, Euros and US Dollars), the insider's post-trade holdings, the transaction date and the reporting date. Director Deals also includes firm identifiers such as ISIN and SEDOL, firm name, and the country in which the transaction was announced. While the sample is very broad in the cross section, there is limited time-series for most countries. To supplement the Director Deals data, I contacted stock exchanges and/or securities regulators to obtain more time-series. I also hand collected information directly from their websites when it was available. I obtained data from Australia, Canada, China, Hong Kong, India and Sweden. To ensure consistency between the Director Deals data and my coding of the hand-collected data, I directly compare a random sample of transactions that overlap between different sources. I keep only purchases and sales of common shares (including sales immediately following stock option exercises) by senior executives and directors. Table 1 summarizes the sample composition, data sources and number of transactions per country. Countries vary substantially in terms of sample

period, trading frequency and incidence of purchases relative to sales. Canada has the highest number of purchases, whereas the U.S. has the largest number of sales. A large portion of the sample consists of European countries, a reflection of the E.U.-wide disclosure requirement for insider trades promulgated in 2005. Many Asian countries also appear to have thousands of transactions, especially Hong Kong and China, for which I could obtain more time series. Other parts of the world are represented as well (e.g., Australia, Israel, South Africa), but the major economy that is missing is Japan, where insider trades are not reported.

I obtain stock market and macroeconomic data from Datastream (firm-level stock prices, shares turnover and shares outstanding; country-level indexes, dividend yield, inflation and GDP) and MSCI (MSCI World Index), financial data from WorldScope (market capitalization, total equity and net income), analyst forecast data from I/B/E/S and management guidance data from Capital IQ. Even though insider trading data is available prior to 2004 for a few countries (primarily the U.S. and U.K.), I report the main results from 2004 onwards, because Capital IQ did not collect management guidance data prior to that date. Including data prior to 2004 without controlling for management guidance yields very similar results (not tabulated).

3.2. Research Design

The main set of tests I run consists of the following pooled time-series and cross-sectional regression, where the unit of observation is a country-quarter:

$$\begin{aligned} \text{Market Return}_{t+1} = & \beta_1 \text{InsiderSignal}_t \\ & + \beta_2 \text{Market Return}_t + \beta_3 \text{Market Return}_{t-1} + \beta_4 \text{World Return}_t \\ & + \beta_5 \text{M/B Ratio}_{t-1} + \beta_6 \text{MarketCap}_{t-1} + \beta_7 \text{Turnover}_t \end{aligned}$$

$$\begin{aligned}
& +\beta_8 DividendYield_t + \beta_9 Inflation_t \\
& +\beta_{10} \Delta InstHold_t + \beta_{11} Net\ Guidance_t + \beta_{12} Net\ Forecasts_t \\
& + \sum \beta_i Country_i + \sum \beta_j Quarter_j + \varepsilon \quad (1)
\end{aligned}$$

The dependent variable is the country-level index return adjusted for the return on a 3-month U.S. Treasury Bill and measured over quarter $t+1$. The main variable of interest is *InsiderSignal*, which is computed in several ways. The first one is the insider purchase ratio, which is the sum of all stock purchases by senior executives and directors in the country during quarter t , scaled by purchases and sales. Because insider purchasing and selling intensity can vary along a variety of dimensions, I compute the purchase ratio as the average of three ratios based on (i) the number of transactions, (ii) the number of companies from which at least one insider buys or sells stock and (iii) the dollar value of transactions.⁵ The purchase ratio is an indicator of insider sentiment. If insider sentiment is predictive of *Market Return* in quarter $t+1$, β_1 should be positive. To mitigate concerns of a purchase ratio based on a small number of transactions, I eliminate country-quarters with less than ten transactions and also construct a purchase ratio weighted by the number of total transactions incurred per country in each quarter. The purchase ratio is by no means the only way to measure insider sentiment. As an alternative, I define net insider purchases as the difference between the total dollar value of insider purchases and that of sales, scaled by the aggregate market capitalization of listed companies in the country at the beginning of the year (as per WorldScope). If insiders trade on macro news not reflected in stock price as of the end of the current quarter, there should also be a positive coefficient on this measure of insider sentiment. Lastly, prior literature finds robust

⁵ Here is an illustrative example: In a given country-quarter, insiders from three different companies purchase a total of \$10 million of stock in five distinct transactions, while insiders from two companies sell \$15 million in five transactions. The purchase ratio is $(5/(5+5)+3/(3+2)+10/(10+15))/3 = 0.5$.

evidence that insider purchases and sales have different predictive ability for future returns. Hence, I allow the coefficients on scaled purchases ($\beta_{1,p}$) and sales ($\beta_{1,s}$) to differ from each other. If aggregate insider buying (selling) is informative for future market returns, I expect $\beta_{1,p}$ ($\beta_{1,s}$) to be significantly positive (negative).⁶

There are two sets of control variables. The first set is a group of risk factors that is likely to explain variation in future market returns. The variables are based on firm-level factors that have been shown to explain cross-sectional variation in stock returns (Fama and French 1993, Carhart 1997, Pastor and Stambaugh 2003). *World Return* is the quarterly return on the MSCI All-Country World Index. Contemporaneous and lagged quarterly country-level market returns (*Market Return*) proxy for momentum and should be correlated with insider sentiment. Insiders tend to be contrarians, buying (selling) more shares following price drops (run-ups). Insiders may also trade in response to perceived mispricing relative to fundamentals, which I proxy for with the aggregate country-level market-to-book ratio (*M/B Ratio*),⁷ where the denominator is summed total equity across all firms in the country based on the most recent annual numbers. I also include market size (*Market Cap*), which is the logged sum of market capitalization across all firms in the country as of the latest fiscal year end, and share turnover (*Turnover*) summed across all firms during the quarter and scaled by average shares outstanding.

Second, I include other macroeconomic and market-based variables that may be associated with future stock returns. *Dividend Yield* is the end-of-quarter country-level

⁶ Since insider holdings are not systematically populated, I do not use them as a scalar, although it would likely be an informative signal. Ideally, insider wealth should be the most powerful scalar (Kallunki et al. 2009). However, data on individuals' wealth is generally unavailable.

⁷ In robustness tests, I also include the country-level price-to-earnings ratio using summed net income as the denominator.

dividend yield calculated by Datastream, while *Inflation* is the quarterly change in consumer price index, converted to US dollars. $\Delta InstHold$ is the aggregate net change in the proportion of shares held by institutional investors, as per Thomson Reuters' Ownership database. If institutional investors adjust their holdings at the country-level in a way that anticipates movements in market returns, β_{11} will be positive. Note that it is not clear how soon institutional holdings are publicly known after the end of the quarter. I include them to provide a benchmark against which to gauge the incremental predictive content of insider sentiment, if any. *Net Guidance* is the number of positive minus negative revisions in management forecasts issued by all companies during the quarter at the country-level, scaled by the number of companies. I classify management forecasts as positive (negative) when Capital IQ labels them as "Corporate Guidance – Raised" ("Corporate Guidance – Lowered").⁸ If aggregate news in firms' issuance of forward-looking information is predictive of future market returns, β_{11} will be positive. *Net Forecasts* is the number of positive minus negative current-year EPS forecast revisions by sell-side analysts, scaled by the number of companies in the country-quarter. If analysts collectively revise their forecasts based on private information related to macroeconomic news not reflected in stock prices by quarter end, β_{12} will be positive as well. However, because those signals are more explicit than insider transactions, it is more likely that market participants will fully incorporate their price implications during the current quarter. Most importantly, those variables are included to ensure that the informativeness of aggregate insider trades is incremental to the signals they contain.

⁸ This classification excludes a large number of disclosures classified as "New/Confirmed." Given that guidance is not the primary focus of the paper and that it would be very costly to manually check whether those disclosures are in fact positive or negative, I rely solely on Capital IQ's classification.

Finally, to account for differences in market performance over time and across countries, I include fixed effects for countries and calendar quarters. This is especially important, given the different starting points for each country in terms of corporate insider transaction data availability.

4. Empirical Results

4.1. Descriptive Statistics

Table 2 reports univariate statistics and correlations for the main variables used throughout the regression tests. Panel A reports country characteristics, which are used in subsequent analyses to test the interactive effect between insider sentiment, future market returns and the institutional environment. The variables are based on prior studies and have been widely used in financial economic research. In Panel B, the mean and median purchase ratios are only slightly above 0.5, suggesting that around the world, corporate insiders buy as much as they sell stock in their own firm. However, the weighted purchase ratio is much lower, consistent with insiders being net sellers in countries with more developed capital markets. Also, mean net purchases are negative (-0.51% of market value), suggesting that dollar values of sales tend to exceed dollar values of purchases in aggregate. In Panel B, the correlation matrix indicates that in the univariate, insider trading signals are not correlated with future market returns. However, the purchase ratio and net purchases are negatively correlated with lagged and contemporaneous returns, suggesting that corporate insiders in the aggregate buy more shares following lower market returns. The purchase ratio is also negatively correlated with market-to-book ratio. The negative correlation between market capitalization and

insider sentiment is consistent with firm-level evidence. Finally, the negative association between the purchase ratio and other signals (net guidance and net analyst forecast revisions) suggests that insider signals may go against firm disclosures and analyst forecasts in the aggregate.

4.2. Regression Results: Full Sample

Before reporting country-level tests, I conduct a preliminary time-series analysis where insider trading data is aggregated across countries. Figure 1 plots the quarterly time series of the mean cross-country purchase ratio weighted by country-level market capitalization along with the value-weighted market return. While weighing by market capitalization gives more weight to large stock markets (chief among which is the U.S.), it smoothes out discontinuities in the time-series due to the addition of countries over time. The graph reveals some patterns, such as the increase in the purchase ratio above 0.6 by the end of 2008 followed by a decrease in 2009 to below 0.4. The cyclical behavior in the time series of insider trades appears to be related to that of stock returns, although it is difficult to tell visually whether it is anticipatory.

Table 3 reports regression results where the dependent variable is country-level returns measured over quarter $t+1$ and the main independent variables of interest are insider trading signals measured at the country level during quarter t . In column (1), the coefficient on *Purchase Ratio* is positive but not significant. In column (2), the coefficient on the weighted purchase ratio is positive and marginally significant ($p < 0.10$), and the magnitude indicates that a one standard deviation in the purchase ratio is associated with 0.2% higher market return in the next quarter. In column (3), similarly, the coefficient on net insider purchases is significantly positive, and the magnitude

indicates that a one standard deviation in net purchases is associated with 0.9% higher market return in the next quarter. As the results in column (4) suggest, the predictive content of insider sentiment comes from insider purchases and sales, which exhibit a significantly positive and negative association with future market returns, respectively. A one standard deviation increase in insider purchases (sales) is associated with an increase (decrease) of market returns of 1.1% (0.6%) in the next quarter. The coefficients on net purchases and purchases are statistically significant at the 0.01 level, while the coefficient on sales is significant at the 0.05 level. Standard errors are clustered at the country level.⁹ Country-level risk factors also exhibit significant association with future returns. The coefficients on both lagged and contemporaneous market returns have a significantly negative sign, and so do the coefficients on country-level market capitalization and share turnover. The aggregate change in institutional holdings is also positively and significantly associated with future market returns, suggesting that, collectively, institutional investors trade on macroeconomic news that is not yet reflected in stock prices. The coefficient suggests that a one-standard deviation increase in institutional holdings is associated with an increase in market returns by 0.3%. The ‘tone’ of earnings guidance in the current quarter is positively and significantly associated with next quarter market returns. A one standard-deviation increase in net guidance is associated with market returns higher by 1.1%. Overall, the results in Table 3 indicate that insider sentiment aggregated at the country-quarter level has statistically and economically

⁹ Alternatively, I also cluster standard errors by calendar quarters and by country-year (Petersen 2009). The conclusions remain qualitatively unchanged under these specifications (untabulated). Also, since the sample consists of a dynamic panel, I use the Arellano and Bond (1991) GMM method with up to five lags of market returns as instruments (based on the `xtabond2` STATA command). The conclusions remain unaffected by this alternative specification. I do not tabulate these results, since they are not incrementally informative.

significant predictive content for next quarter market returns, and the association is incremental to that conveyed by other signals.¹⁰

4.3. Regression Results: Investor Protection

Table 4 reports regression results where the dependent variable is quarter $t+1$ country-level return and the sample is partitioned based on the level of investor protection in each country, in order to test H1.

Table 4, Panel A reports coefficients on net insider purchases, proxies based on country-level investor protection, and their interaction terms. For brevity, other variables are not tabulated. In column (1), *High Rule of Law* indicates countries with a rule of law score above 8.56. The significantly negative coefficient on *Net Purchases*High Rule of Law* suggests that insider sentiment has less predictive content in countries where the rule of law is more pronounced. In column (2), *High Anti-Self-Dealing* indicates countries with an anti-self-dealing score above 0.43. The coefficient on *Net Purchases*High Anti-Self-Dealing* is not significant, suggesting that anti-self-dealing provisions have no effect on the predictive content of insider sentiment.¹¹ In column (3), *High Insider Trading*

¹⁰ The significance of the insider sentiment signals in the regression results stands in contrast to the lack of significant correlation between future returns and those signals in Table 2. Untabulated results show that insider sentiment is also significantly associated with future returns when the only other set of control variables are the country and quarter fixed effects, which shows the importance of controlling for unobservable cross-country differences in this setting. Fixed effects also account for a large portion of the regressions' R^2 .

¹¹ While this may seem inconsistent with the results in Fidrmuc et al. (2012), there are several plausible explanations for the apparent differences. First, Fidrmuc et al. (2012) examine insider transactions at the firm-level. The fact that *aggregate* insider sentiment is equally informative across countries irrespective of anti-self-dealing regulation is not inconsistent with their findings, since insiders' proclivity to trade on aggregate versus idiosyncratic information can vary based on firm- and country-level factors. Second, Fidrmuc et al. (2012) examine returns immediately following insider transaction disclosures, whereas I look at returns in the next calendar quarter. Therefore, the delay between some of the trades and the measurement of the dependent variable can be up to three months. Third, differences in sample composition (both in time series and in cross section) can also contribute to different results. However, when I restrict my sample to the countries and sample period that overlap with those of Fidrmuc et al. (2012), I still find no evidence that aggregate insider purchases are more informative in countries with higher shareholder protection.

Regulation indicates countries with an insider trading regulation score above 4.53. The significantly negative coefficient on *Net Purchases*High Insider Trading Regulation* suggests that insider sentiment has less predictive content in countries with stricter regulation against insider trading. Columns (1) and (3), therefore, suggest that investor protection—as captured by rule of law and insider trading regulation—may mitigate the predictive content of insider sentiment, presumably by curbing informed trading by corporate insiders. However, the results in column (4), where insider net purchases are jointly interacted with all three proxies for investor protection, indicate that none of the proxies for investor protection significantly affects the predictive content of insider sentiment when all are accounted for simultaneously. Meanwhile, the coefficient on net insider purchases is positive and significant in all four regressions, suggesting that insider sentiment is informative in countries with relatively low investor protection. Note that the coefficients on the investor protection variables are positive and mostly significant, suggesting that stock returns are higher, on average, in countries with greater investor protection.

In Panel B, the sample is split based on countries' investor protection score of zero or one (low) and two or three (high), using the sum of *High Rule of Law*, *High Anti-Self-Dealing* and *High Insider Trading Regulation*. Column (1) reports regression results for the low investor protection group, and column (2) reports regression results for the high investor protection group. The coefficient on insider net purchases is positive in both subsamples. However, it is statistically significant only in the low investor-protection group ($p < 0.01$). Furthermore, the F-test for the comparison of the coefficients on *Net Purchases*

across the two groups indicates that the coefficients differ significantly between high- and low-protection groups ($F=3.25$, $p<0.10$).

Overall, investor protection appears to have some effect on the predictive content of insider sentiment, although this cannot be attributed to any single measure of investor protection among the three proxies under consideration.

4.4. Regression Results: Information Environment

Table 5 reports regression results for the analysis of aggregate insider trading's association with future market returns across partitions based on the transparency of the information environment, in order to test H2.

Table 5, Panel A reports coefficients on net insider purchases, proxies based on country-level information environment transparency, and their interaction terms. For brevity, other variables are not tabulated. In column (1), *Low Earnings Management* (also *Low EM*) indicates countries with an earnings management score below 17. The significantly negative coefficient on *Net Purchases*Low EM* suggests that insider sentiment has less predictive content in countries where earnings management is less prevalent.¹² In column (2), *IFRS* indicates country-years where IFRS is mandatorily adopted by all publicly-listed firms. The coefficient on *Net Purchases*IFRS* is also negative but not significant. In column (3), *Low Transaction Costs* (also *Low Cost*) indicates countries with transaction cost scores below 45, as per Table 4 in Chan et al. (2005). The significantly negative coefficient on *Net Purchases*Low Cost* suggests that insider sentiment has less predictive content in countries with lower transaction costs. This suggests that market participants, even though they observe insider trades in a timely

¹² The results (not tabulated) are qualitatively similar using the country-level earnings quality rankings from Bhattacharya et al. (2003).

manner in all countries in the sample, may find it too costly to trade on that information in countries with high transaction costs. In column (4), net insider purchases are interacted with all three proxies for information environment transparency. The coefficients on *Net Purchases*IFRS* and *Net Purchases*Low Cost* are significantly negative ($p < 0.10$ for both), while the coefficient on *Net Purchases*Low EM* is also negative but only marginally significant. Overall, though, the results indicate that insider sentiment has lower predictive content in countries with relatively fewer information-related frictions.¹³

In Panel B, the sample is split based on countries' transparency score ranging from zero or one (low) to two or three (high), based on the sum of *Low Earnings Management*, *IFRS* and *Low Transaction Costs*. Column (1) reports regression results for the low transparency group, while column (2) reports regression results for the high transparency group. The coefficient on insider net purchases is positive and significant only in the low transparency group ($p < 0.01$). Furthermore, the F-test for the comparison of the coefficients on *Net Purchases* across the two groups indicates that the coefficients differ significantly between low- and high-transparency countries ($F = 7.83$, $p < 0.01$). Hence, insider sentiment has significantly greater predictive content in countries with relatively less transparent information environments.

4.5. Regression Results: Investor Protection and Information Transparency

¹³ Following Morck et al. (2000) and Fernandes and Ferreira (2009) among others, I also use an estimate of country-level stock price synchronicity as a proxy for investor protection and the information environment. While aggregate signals may be more informative in countries where less firm-specific information is incorporated into stock price, prior research finds that insider trading is associated with lower firm-level synchronicity (Piotroski and Roulstone 2004). However, I find no evidence that the predictive content of aggregate insider trading varies significantly with country-level synchronicity (not tabulated).

Table 6 reports regression results for the combined analysis of the effect of country-level investor protection and information transparency on the predictive content of insider sentiment. Since prior research finds that investor protection and information transparency are correlated, this is an important step to substantiate the conclusions drawn from Tables 4 and 5. As in Tables 3 to 5, the dependent variable is market return in the next quarter at the country level. In column (1), the coefficient on net insider purchases is significantly positive. The coefficients on *Net Purchases*Protection* and *Net Purchases*Transparency* are significantly negative ($p < 0.10$ and $p < 0.01$, respectively). Hence, the mitigating effect of country-level investor protection and transparency on the predictive content of insider sentiment holds when controlling for both sets of institutional factors. In column (2), the coefficient on *Purchases*Transparency* is significantly negative ($p < 0.01$), and the coefficient on *Sales*Transparency* is significantly positive ($p < 0.05$), which indicates that country-level transparency has a mitigating effect on the predictive content of aggregate insider purchases and sales. In contrast, the level of investor protection does not affect purchases and sales to a significant extent. Overall, the results in Tables 4, 5 and 6 suggest that country-level characteristics of investor protection and the information environment can affect the predictive content of insider sentiment. This is consistent with two mechanisms through which insider sentiment's predictive content varies across countries: (i) a lower propensity of corporate insiders to trade on their private information about macroeconomic news in countries with stronger institutions, and (ii) a substitute effect between disclosed corporate insider trades and other sources of information in aggregate.

That is, when country-level transparency is relatively high, the market is more likely to infer insiders' private information about macro news through other channels.

4.6. Regression Results: Future Changes in Real Activity

The last set of tests reported in Table 7 examines the association between aggregate insider trading and future changes in real activity. In Panel A, the dependent variable is the compounded growth in GDP over quarters $t+1$ and $t+2$, measured in US dollars. I use a six-month window because the stock market is more likely to anticipate the following quarter's change in GDP, especially since I do not observe the unanticipated portion thereof. In the first two columns, the coefficient on the (weighted) insider purchase ratio is insignificantly different from zero. In column (3), the coefficient on net purchases is positive and significant ($p < 0.10$). The magnitude indicates that a one standard-deviation increase in net purchases is associated with 0.5% higher GDP growth. In column (4), the coefficient on insider purchases is positive and significant, whereas the coefficient on insider sales is not significant. Hence, the results in Panel A indicate that aggregate insider purchases are predictive of future growth in GDP at the country level. The association is incremental to the significantly positive association between future GDP growth and contemporaneous (i) market returns and (ii) dividend yield.

In Panel B, the dependent variable is the change in aggregate return on equity, calculated on a rolling four-quarter window, using companies' different fiscal year ends to compute quarterly updates on annual ROE. In all four columns, the coefficient on insider sentiment proxies is insignificant. Hence, insider sentiment has no predictive content for aggregate earnings. One possible explanation for the lack of apparent association between aggregate insider trades and future earnings is that insiders trade

ahead of earnings news over a longer horizon than is captured in my setting (Ke et al. 2003).

4.7. Additional analyses and robustness tests

I perform a variety of sensitivity tests besides the ones mentioned in footnotes in the previous subsections. One concern with the sample is the effect of individual countries on the overall results. In particular, the U.S. represents the largest stock market and accounts for a significant portion of global insider trading activity. As a sensitivity test, I exclude the U.S. from the analysis and find that the conclusions are unaffected when based upon non-U.S. data (not tabulated). Another concern is that I merge insider trading datasets from various sources. Not all variables available in Directors Deals can be found in the datasets I obtain from stock exchanges, which means that my sample selection criteria may not uniformly succeed in filtering out transactions that I deem irrelevant ex ante (e.g., trades on behalf of relatives). To alleviate this concern, I re-run the analysis with only the information obtained from Director Deals (not tabulated). The conclusions remain qualitatively similar, although the statistical significance decreases slightly in some partitions.

5. Conclusion

This study analyzes the predictive ability of aggregate corporate insider trading (insider sentiment) for market returns in a cross-country setting. Over the past decade, several regulatory agencies and stock exchanges around the world have either promulgated rules to require the timely disclosure of equity transactions by senior executives and directors of publicly listed corporations, or enhanced existing rules by

accelerating the dissemination of information about those transactions. Those rules were passed in response to demand from investors who believe that reports of corporate insiders' transactions provide useful information and in response to regulators' view that timely disclosure helps to discourage corporate insiders from trading opportunistically on material information. As a result, a large and increasing number of insider transactions are disclosed every year around the world.

I examine if country-level insider sentiment is associated with future country-level stock returns. For this association to hold, it must be that (i) insiders have private information about macro-economic news and (ii) their collective equity purchasing or selling behavior is at least partly reflective of that information. There are several reasons this association may not hold. First, insiders may not trade on private information because of the expected penalties associated with engaging in opportunistic self-dealing. Second, insiders may primarily trade on firm-idiosyncratic information, in which case the signals would cancel out once aggregated across firms.

Using data from up to 39 countries, I find a significantly positive association between country-quarter aggregate net insider purchases and future market returns. Furthermore, purchases (sales) exhibit a significantly positive (negative) association with future returns.

Cross-sectional analyses provide further insight into the circumstances under which the predictive ability of aggregate insider trading is more likely to hold. In particular, the results reveal that insider sentiment is more significantly associated with future market returns in countries with lower investor protection and a less transparent information environment. Collectively, these results suggest that corporate insiders trade

less intensely on macroeconomic news and/or market prices reflect their private information about future macroeconomic news sooner (and possibly through other channels) in countries with relatively stronger capital-market institutions.

Finally, I find some evidence that aggregate insider purchases are positively associated with subsequent growth in GDP, suggesting that insiders trade on private knowledge of future changes in real activity. Overall, the evidence is consistent with aggregate insider trading being informative about future market returns at the country level, in a cross-country setting. This suggests that regulatory initiatives that require the timely disclosure of corporate insider transactions provide global equity market participants with useful information for their portfolio allocation.

This paper can pave the way for further research on the informativeness of insider trading in a cross-country setting. For example, do insider trades aggregated across countries (e.g., at the industry level) predict future returns? To what extent do country-versus firm-level governance mechanisms affect insider trading activity? Can other promptly disclosed trades (e.g., by blockholders) also be informative?

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Appendix: Variable Definitions

Variable	Definition
<i>Market Return</i>	Country-level return compounded over a calendar quarter, from Datastream country indices in US dollars, minus the return on a 3-month U.S. T-Bill. Suffixes t-1, t, and t+1 indicate past, contemporaneous and future returns.
<i>Purchase Ratio</i>	Composite ratio of insider purchases to total insider transactions aggregated at country-quarter level. The ratio is calculated as the average of (i) the number of insider purchases to the number of insider purchases plus sales, (ii) the number of unique companies from which at least one insider purchases shares, divided by the number of unique companies from which at least one insider purchases or sells shares, and (iii) the US dollar value of insider purchases divided by the US dollar value of insider purchases and sales. Only open market purchases or sales of common shares by senior executives or directors are included.
<i>Purchase Ratio weighted</i>	<i>Purchase Ratio</i> times the number of insider transactions during the country-quarter and scaled by the country's logged market capitalization.
<i>Net \$ Purchases</i>	Total value in US dollars of insider purchases minus insider sales aggregated at the country-quarter level, scaled by country-level market capitalization. Only open market purchases or sales of common shares by senior executives or directors are included.
<i>\$ Purchases (\$ Sales)</i>	Total value in US dollars of insider purchases (sales) aggregated at the country-quarter level, scaled by country-level market capitalization. Only open market purchases or sales of common shares by senior executives or directors are included.
<i>World Return</i>	Return on the MSCI All-Country Index compounded over the calendar quarter.
<i>M/B Ratio</i>	Country-level market capitalization divided by country-level total shareholder equity (summed across all firms listed in the country with data available in WorldScope.), based on the most recent annual accounting data available.
<i>Market Cap</i>	Logged country-level market capitalization (summed across all firms listed in the country with data available in WorldScope.), as of the end of the most recent calendar year.
<i>Liquidity</i>	Total shares traded during the quarter across all listed firm in the country, scaled by total shares outstanding.
<i>Dividend Yield</i>	Average country-level dividend yield during the calendar quarter, as per Datastream.
<i>Inflation</i>	Quarterly change in the country's consumer price index, in USD, as per Datastream.
<i>Δ Inst. Hold.</i>	Quarterly change in shares held by institutional investors scaled by shares outstanding at the country-level, as reported in Thomson Reuters Ownership.
<i>Net Guidance</i>	Number of positive minus number of negative management forecast revisions (as per Capital IQ) at the country-quarter level, scaled by the number of companies in the country.
<i>Net Forecasts</i>	Number of positive minus number of negative analyst forecast revisions (as per I/B/E/S) at the country-quarter level, scaled by the number of companies in the country. Forecasts revisions must be made by the same analyst within the quarter.

Appendix (cont'd)

Variable	Definition
<i>High Rule of Law</i>	Indicator variable equal to one if a country's rule of law score (as per LaPorta et al. 1998) is 8.56 or above, and zero otherwise.
<i>High Anti-Self-Dealing</i>	Indicator variable equal to one if a country's anti-self-dealing index (as per Djankov et al. 2008) is 0.43 or above, and zero otherwise.
<i>High Insider Trading Regulation</i>	Indicator variable equal to one if a country's insider trading regulation score (as Du and Wei 2004) is 4.53 or above, and zero otherwise.
<i>Investor Protection</i>	Sum of <i>High Rule of Law</i> , <i>High Anti-Self-Dealing</i> and <i>High Insider Trading Regulation</i> .
<i>Low Earnings Management</i>	Indicator variable equal to one if a country's earnings management score (as per Leuz et al. 2003) is 17 or below, and zero otherwise.
<i>IFRS</i>	Indicator variable equal to one for all quarters in a country after it has fully adopted International Financial Reporting Standards, and zero otherwise.
<i>Low Transaction Costs</i>	Indicator variable equal to one if a country's estimated transaction costs (as per Chan et al. 2005) is 45 or below, and zero otherwise.
<i>Transparency</i>	Sum of <i>Low Earnings Management</i> , <i>IFRS</i> and <i>Low Transaction Costs</i> .
<i>GDP Growth</i>	Quarterly change in the country's GDP in USD, as per Datastream. Subscript t indicates contemporaneous change, while t+1, t+2 indicates future change compounded over the next two quarters.
<i>Logged GDP</i>	Natural logarithm of country-level GDP as of the end of the quarter, in USD, as per Datastream.
<i>Δ Return on Equity</i>	Country-level net income scaled by country-level total shareholder equity reported for all firms with a fiscal year ending over the next twelve months starting at the end of the current quarter minus the last twelve months, based on all firms in a country with data available in WorldScope.
<i>Return on Equity</i>	Country-level net income scaled by country-level total shareholder equity reported for all firms with a fiscal year ending over the last twelve months preceding the current quarter, based on all firms in a country with data available in WorldScope.

Table 1: Sample Composition and Country-Level Descriptive Statistics

Country	Start Date	Supplemental Source(s)	Number of Purchases	Number of Sales
Australia	01/2003	ASX	8154	1772
Austria	10/2008		674	149
Bangladesh	01/2010		511	564
Belgium	05/2006		742	1117
Canada	06/2003	SEDI	96160	124406
China	01/2006	Shanghai and Shenzhen Stock Exchanges	11377	21257
Czech Republic	01/2005		167	126
Denmark	01/2007		1701	702
Egypt	01/2009		1041	1282
France	04/2006		4821	6010
Germany	07/2002		8431	5501
Greece	01/2008		7427	1240
Hong Kong	01/2003	HKEx	34520	12572
Iceland	01/2007		76	33
India	01/2009		7209	9418
Ireland	01/1999		308	191
Israel	01/2010		1844	1005
Italy	01/2003		6496	5045
Lithuania	01/2007		266	34
Luxembourg	01/2010		32	32
Malaysia	01/2009		5607	4046
Netherlands	01/1999		2331	3794
New Zealand	10/2008		338	200
Norway	01/2007		2208	1006
Philippines	01/2009		1299	1948
Poland	01/2010		1679	1199
Portugal	01/2009		288	126
Singapore	01/2009		2708	636
South Africa	12/2008		1643	2680
South Korea	09/2011		1752	1290
Spain	09/2006		2425	669
Sri Lanka	01/2010		420	264
Sweden	01/2001	Swedish Financial Supervisory Authority	17408	9742
Switzerland	02/2007		4190	4478
Thailand	01/2009		3595	4389
Turkey	01/2010		1495	1052
United Kingdom	01/1999		23860	14540
United States	01/2000	Thomson Reuters	60237	493820
Vietnam	10/2010		1284	1055

This table presents country-level sample start dates, data sources (besides Director Deals) and number of transactions reported by senior directors and officers, separately for purchases and sales.

Table 2: Descriptive Statistics

Panel A: Country characteristics

Country	High Rule of Law	High ASD	High Insider Trading Regulation	Low Earnings Management	IFRS Adoption Year	Low Transaction Costs
Australia	1	1	1	1	2005	0
Austria	1	0	1	0	2005	0
Bangladesh	n/a	n/a	n/a	n/a		n/a
Belgium	1	1	1	0	2005	1
Canada	1	1	1	1	2011	0
China	0	1	0	0		0
Czech Republic	n/a	0	0	n/a	2005	n/a
Denmark	1	1	1	1	2005	1
Egypt	0	0	0	n/a		n/a
France	1	0	1	1	2005	1
Germany	1	0	1	0	2005	1
Greece	0	0	0	0	2005	0
Hong Kong	0	1	0	0	2005	0
Iceland	n/a	0	0	n/a	2005	n/a
India	0	1	0	0		0
Ireland	0	1	1	1	2005	0
Israel	0	1	0	n/a	2008	n/a
Italy	0	0	0	0	2005	1
Lithuania	n/a	0	n/a	n/a	2005	n/a
Luxembourg	n/a	0	1	n/a	2005	n/a
Malaysia	0	1	0	1	2012	0
Netherlands	1	0	1	1	2005	1
New Zealand	1	1	1	n/a	2005	1
Norway	1	0	0	1	2005	1
Philippines	0	0	0	1	2005	0
Poland	n/a	0	0	n/a	2005	n/a
Portugal	1	1	0	0	2005	1
Singapore	1	1	1	0	2003	0
South Africa	0	1	0	1	2005	0
South Korea	0	1	0	0		0
Spain	0	0	0	0	2005	1
Sri Lanka	n/a	0	n/a	n/a		n/a
Sweden	1	0	1	1	2005	1
Switzerland	1	0	0	0	2005	1
Thailand	0	1	0	0		0
Turkey	0	0	0	0	2005	0
United Kingdom	1	1	1	1	2005	1
United States	1	1	1	1		1
Vietnam	n/a	n/a	1	n/a		n/a

Table 2 (cont'd)

Panel A: Descriptive Statistics

Variable	N	Mean	Std. dev.	Lower quartile	Median	Upper quartile
Market Return $t+1$	785	0.0141	0.1423	-0.0580	0.0191	0.0902
Market Return t	785	0.0149	0.1433	-0.0580	0.0191	0.0890
Market Return $t-1$	785	0.0114	0.1461	-0.0652	0.0162	0.0901
Purchase Ratio	785	0.5230	0.1961	0.3891	0.5299	0.6589
Purchase Ratio _{weighted}	785	0.2318	0.4528	0.0268	0.0861	0.2419
Net \$ Purchases	785	-0.0051	0.0536	-0.0152	-0.0024	0.0033
\$ Purchases	785	0.0196	0.0474	0.0013	0.0061	0.0206
\$ Sales	785	0.0249	0.0404	0.0037	0.0120	0.0295
World Return	785	0.0127	0.1036	-0.0236	0.0266	0.0672
M/B Ratio	785	1.6617	0.6089	1.2213	1.5921	2.0791
Market Capitalization	775	13.2585	1.4754	12.2597	13.3500	14.1416
Liquidity	785	0.0595	0.0530	0.0272	0.0477	0.0772
Dividend Yield	781	0.0312	0.0141	0.0221	0.0292	0.0368
Inflation	781	0.0063	0.0096	0.0011	0.0054	0.0104
Δ Institutional Holdings	785	0.0005	0.0036	0.0000	0.0001	0.0006
Net Guidance	782	0.0033	0.0195	-0.0011	0.0000	0.0050
Net Forecasts	783	-0.0052	0.2025	-0.0674	0.0000	0.0701
GDP Growth $t+1,t+2$	714	0.0189	0.0716	-0.0010	0.0110	0.0250
GDP Growth t	764	0.0109	0.0718	-0.0256	0.0122	0.0501
Logged GDP t	764	9.7949	3.1427	8.0152	10.8449	11.6357
Δ Return on Equity $t,t+3$	582	-0.0193	0.0850	-0.0685	0.0021	0.0354
Return on Equity $t-1$	775	0.1258	0.0679	0.0702	0.1287	0.1662

Table 2 (cont'd)

Panel B: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Market Return $t+1$ (1)		0.19	-0.15	0.05	0.05	0.12	-0.27	-0.07	0.00	0.09	-0.10	0.07	0.03	-0.01
Market Return t (2)			0.19	-0.26	-0.13	0.85	-0.25	-0.09	0.05	-0.23	0.12	0.11	0.10	0.31
Market Return $t-1$ (3)				-0.25	-0.01	0.26	-0.10	-0.03	0.09	-0.32	0.14	0.03	0.11	0.28
Purchase Ratio (4)					0.32	-0.26	-0.18	-0.35	-0.11	0.36	-0.04	-0.04	-0.21	-0.26
Net \$ Purchases (5)						-0.08	0.01	-0.07	0.00	0.03	0.03	-0.04	-0.03	-0.05
World Return (6)							-0.19	-0.04	0.01	-0.24	0.17	0.10	0.10	0.32
M/B ratio (7)								0.49	0.06	-0.24	0.02	-0.05	0.02	0.00
Market Capitalization (8)									0.13	-0.20	-0.06	-0.09	0.20	0.02
Liquidity (9)										-0.17	0.07	-0.02	-0.05	0.02
Dividend Yield (10)											-0.20	0.01	-0.17	-0.33
Inflation (11)												0.02	0.01	0.16
Δ Inst. Holdings (12)													-0.03	0.03
Net Guidance (13)														0.15
Net Forecasts (14)														

Notes: This table reports descriptive statistics and correlations for the main variables used in subsequent regressions analyses. The sample consists of 39 countries for which disclosed corporate insider trading data is available. Panel A reports indicators for countries with a rule of law score above 8.56 (as per Table 5 from LaPorta et al. 1998), an anti-self-dealing index (ASD) above 0.43 (ASD obtained from Andrei Shleifer's webpage), an insider trading regulation score above 4.53 (as per Appendix B in Davis and Xu 2013), an earnings management score below 17 (as per Table 2 in Leuz et al. 2003), and transaction costs below 45 (as per Table 4 in Chan et al. (2005)). In Panels B and C, the unit of observation is a country-quarter. Panel B reports descriptive statistics and Panel C Pearson correlations. All variables are defined in detail in the Appendix. In Panel C, correlations in bold font are significantly different from zero at the 0.10 level or higher.

Table 3: Country-Level Insider Trading and Future Returns – Full Sample

Market Return $_{t+1}$	(1)	(2)	(3)	(4)
<i>Insider Trading Signals</i>				
Purchase Ratio	0.03 (1.31)			
Purchase Ratio _{weighted}		0.01* (1.77)		
Net Purchases			0.17*** (3.33)	
Purchases				0.23*** (3.11)
Sales				-0.14** (-2.53)
<i>Risk Factors</i>				
Market Return $_t$	-0.10** (-2.37)	-0.10** (-2.48)	-0.10** (-2.49)	-0.10** (-2.60)
Market Return $_{t-1}$	-0.15*** (-4.69)	-0.15*** (-4.74)	-0.15*** (-4.74)	-0.15*** (-4.90)
World Return $_t$	0.65 (1.28)	0.66 (1.31)	0.62 (1.21)	0.64 (1.26)
M/B Ratio	0.01 (1.13)	0.01 (1.27)	0.01 (1.06)	0.01 (1.00)
Market Capitalization	-0.03*** (-3.49)	-0.03*** (-3.90)	-0.03*** (-3.76)	-0.03*** (-3.56)
Liquidity	0.03 (0.19)	0.03 (0.17)	0.04 (0.24)	0.04 (0.23)
<i>Other Signals</i>				
Dividend Yield	-0.12 (-0.51)	-0.13 (-0.52)	-0.07 (-0.28)	-0.07 (-0.29)
Inflation	-0.32 (-0.91)	-0.28 (-0.82)	-0.29 (-0.85)	-0.30 (-0.87)
Δ Institutional Holdings	0.86** (2.66)	0.84** (2.68)	0.86** (2.65)	0.86** (2.70)
Net Guidance	0.55*** (3.13)	0.58*** (2.79)	0.54*** (3.15)	0.54*** (3.14)
Net Forecasts	-0.00 (-0.02)	-0.00 (-0.28)	-0.00 (-0.11)	-0.00 (-0.09)
Fixed Effects	Country & Quarter	Country & Quarter	Country & Quarter	Country & Quarter
Observations	768	768	768	768
R-Square	80.55%	80.51%	80.72%	80.76%

Notes: This table reports regression results where the dependent variable is future stock return measured at the country-quarter level. The independent variables include country-level insider trading signals aggregated over the quarter, contemporaneous market-level risk measures (world factor, momentum, aggregate market-to-book ratio, country-level market cap and share turnover) and additional country-level signals (dividend yield, inflation, change in institutional holdings, number of positive minus negative earnings forecast revisions issued by firms and analysts). All regressions include country and calendar quarter fixed effects. Variables are defined in greater detail in the Appendix. Coefficients and t-statistics based on standard errors clustered by country are reported. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 level.

Table 4: Country-Level Insider Trading and Future Returns – Investor Protection

Panel A: Interactions				
Market Return $_{t+1}$	(1)	(2)	(3)	(4)
<i>Insider Trading Signals</i>				
Net Purchases	0.26*** (4.51)	0.17*** (3.65)	0.30*** (5.40)	0.27*** (5.07)
<i>Investor Protection Measures</i>				
High Rule of Law	0.07* (1.86)			0.04 (1.64)
High Anti-Self-Dealing		0.08** (2.41)		0.05*** (3.72)
High Insider Trading Regulation			0.08** (2.21)	-0.02 (-1.15)
<i>Interaction Terms</i>				
Net Purchases*High Rule of Law	-0.20* (-1.91)			0.23 (0.56)
Net Purchases*High ASD		-0.01 (-0.08)		0.03 (0.18)
Net Purchases*High IT Reg			-0.28** (-2.41)	-0.46 (-1.13)
Control Variables	Included	Included	Included	Included
Fixed Effects	Country & Quarter	Country & Quarter	Country & Quarter	Country & Quarter
Observations	727	768	768	727
R-Square	82.22%	80.64%	80.82%	82.28%

Table 4 (cont'd)

Panel B: Partitions by Investor Protection Score		
Market Return $t+1$	Low (1)	High (2)
<i>Insider Trading Signals</i>		
Net Purchases	0.26*** (4.69)	0.10 (1.42)
<i>Risk Factors</i>		
Market Return t	-0.08 (-1.40)	-0.08 (-1.65)
Market Return $t-1$	-0.15** (-2.18)	-0.16** (-2.77)
World Return t	1.02 (1.03)	-0.25 (-0.45)
M/B Ratio	0.00 (0.21)	-0.00 (-0.05)
Market Capitalization	-0.02 (-1.66)	-0.04** (-2.66)
Liquidity	-0.15 (-0.91)	-0.08 (-0.25)
<i>Other Signals</i>		
Dividend Yield	-0.26 (-0.49)	-0.18 (-0.60)
Inflation	-0.07 (-0.11)	-0.70* (-1.95)
Δ Institutional Holdings	0.42 (0.20)	0.55** (2.43)
Net Guidance	0.59 (0.56)	0.32** (2.77)
Net Forecasts	-0.00 (-0.17)	0.01 (0.88)
Fixed Effects	Country & Quarter	Country & Quarter
Observations	278	449
R-Square	77.80%	88.45%
F-Test Net Purchases High=Low	3.25*	

Notes: This table reports regression results where the dependent variable is future stock return measured at the country-quarter level. The independent variables include country-level insider trading signals aggregated over the quarter, country-level proxies for investor protection (rule of law, anti-self-dealing index and insider trading regulation), contemporaneous market-level risk measures (world factor, momentum, aggregate P/E ratio, aggregate market-to-book ratio) and additional country-level signals (number of positive and negative earnings forecast revisions issued by firms and analysts). All regressions include country and quarter fixed effects. Variables are defined in greater detail in the Appendix. In Panel A, insider trading signals are interacted with investor protection proxies. In Panel B, the sample is partitioned by country-level investor protection score, where low indicates countries with a score of 0 or 1, and high 2 or 3. Coefficients and t-statistics based on standard errors clustered by country are reported. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 level.

**Table 5: Country-Level Insider Trading and Future Returns –
Information Environment Transparency**

Panel A: Interactions				
Market Return $_{t+1}$	(1)	(2)	(3)	(4)
<i>Insider Trading Signals</i>				
Net Purchases	0.21*** (3.57)	0.38** (2.09)	0.24*** (4.99)	0.54*** (3.56)
<i>Information Environment Measures</i>				
Low Earnings Management	0.09** (2.37)			0.03 (1.25)
IFRS		-0.02* (-1.72)		-0.02** (-2.01)
Low Transaction Costs			0.08** (2.33)	0.03 (1.34)
<i>Interaction Terms</i>				
Net Purchases*Low EM	-0.24* (-1.99)			-0.21 (-1.39)
Net Purchases*IFRS		-0.23 (-1.18)		-0.29* (-1.83)
Net Purchases*Low Cost			-0.34*** (-3.03)	-0.27* (-1.81)
Control Variables	Included	Included	Included	Included
Fixed Effects	Country & Quarter	Country & Quarter	Country & Quarter	Country & Quarter
Observations	716	768	734	716
R-Square	81.04%	80.70%	81.07%	81.26%

Table 5 (cont'd)

Panel B: Partitions by Information Environment Transparency		
Market Return $t+1$	Low	High
	(1)	(2)
<i>Insider Trading Signals</i>		
Net Purchases	0.25*** (5.15)	-0.01 (-0.07)
<i>Risk Factors</i>		
Market Return t	-0.18* (-1.82)	-0.13** (-2.60)
Market Return $t-1$	-0.15*** (-3.09)	-0.13* (-1.98)
World Return t	2.06* (1.75)	0.30 (0.60)
M/B Ratio	-0.00 (-0.15)	0.00 (0.30)
Market Capitalization	-0.02 (-0.99)	-0.01 (-0.99)
Liquidity	-0.10 (-0.55)	0.07 (0.26)
<i>Other Signals</i>		
Dividend Yield	-1.67 (-1.17)	0.05 (0.19)
Inflation	-0.21 (-0.50)	-0.80 (-1.30)
Δ Institutional Holdings	-1.28 (-0.26)	0.41** (2.16)
Net Guidance	0.78 (1.31)	0.27*** (2.91)
Net Forecasts	0.11 (1.25)	0.01 (0.82)
Fixed Effects	Country & Quarter	Country & Quarter
Observations	240	476
R-Square	81.45%	86.74%
F-Test Net Purchases High=Low	7.83***	

Notes: This table reports regression results where the dependent variable is future stock return measured at the country-quarter level. The independent variables include country-level insider trading signals aggregated over the quarter, country-level proxies for information transparency (earnings management, IFRS adoption and transaction costs), contemporaneous market-level risk measures (world factor, momentum, aggregate P/E ratio, aggregate market-to-book ratio) and additional country-level signals (number of positive and negative earnings forecast revisions issued by firms and analysts). All regressions include country and quarter fixed effects. Variables are defined in greater detail in the Appendix. In Panel A, insider trading signals are interacted with information transparency proxies. In Panel B, the sample is partitioned by country-level information transparency score, where low indicates countries with a score of 0 or 1, and high 2 or 3. Coefficients and t-statistics based on standard errors clustered by country are reported. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 level.

Table 6: Country-Level Insider Trading and Future Returns – Investor Protection and Information Environment Transparency

Market Return $t+1$	(1)	(2)
<i>Insider Trading Signals</i>		
Net Purchases	0.53*** (5.33)	
Purchases		0.67*** (7.02)
Sales		-0.47** (-2.23)
<i>Institutional Factors</i>		
Investor Protection	0.03** (2.54)	0.03** (2.20)
Transparency	-0.02** (-2.17)	-0.01 (-1.62)
<i>Interaction Terms</i>		
Net Purchases*Investor Protection	-0.07* (-1.87)	
Net Purchases*Transparency	-0.20*** (-3.41)	
Purchases*Investor Protection		-0.03 (-0.53)
Purchases*Transparency		-0.34*** (-4.35)
Sales*Investor Protection		0.07 (0.88)
Sales*Transparency		0.15** (2.57)
Control Variables	Included	Included
Fixed Effects	Country & Quarter	Country & Quarter
Observations	689	689
R-Square	82.77%	82.80%

Notes: This table reports regression results where the dependent variable is future stock return measured at the country-quarter level. The independent variables include country-level insider trading signals aggregated over the quarter, proxies for the degree of investor protection and information transparency at the country-level, contemporaneous market-level risk measures (world factor, momentum, aggregate market-to-book ratio, country-level market cap and share turnover) and additional country-level signals (dividend yield, inflation, change in institutional holdings, number of positive minus negative earnings forecast revisions issued by firms and analysts). The dependent variables also include interaction terms between insider trading signals and proxies for investor protection and information transparency. All regressions include country and calendar quarter fixed effects. Variables are defined in greater detail in the Appendix. Coefficients and t-statistics based on standard errors clustered by country are reported. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 level.

Table 7: Country-Level Insider Trading and Future Changes in Real Activity

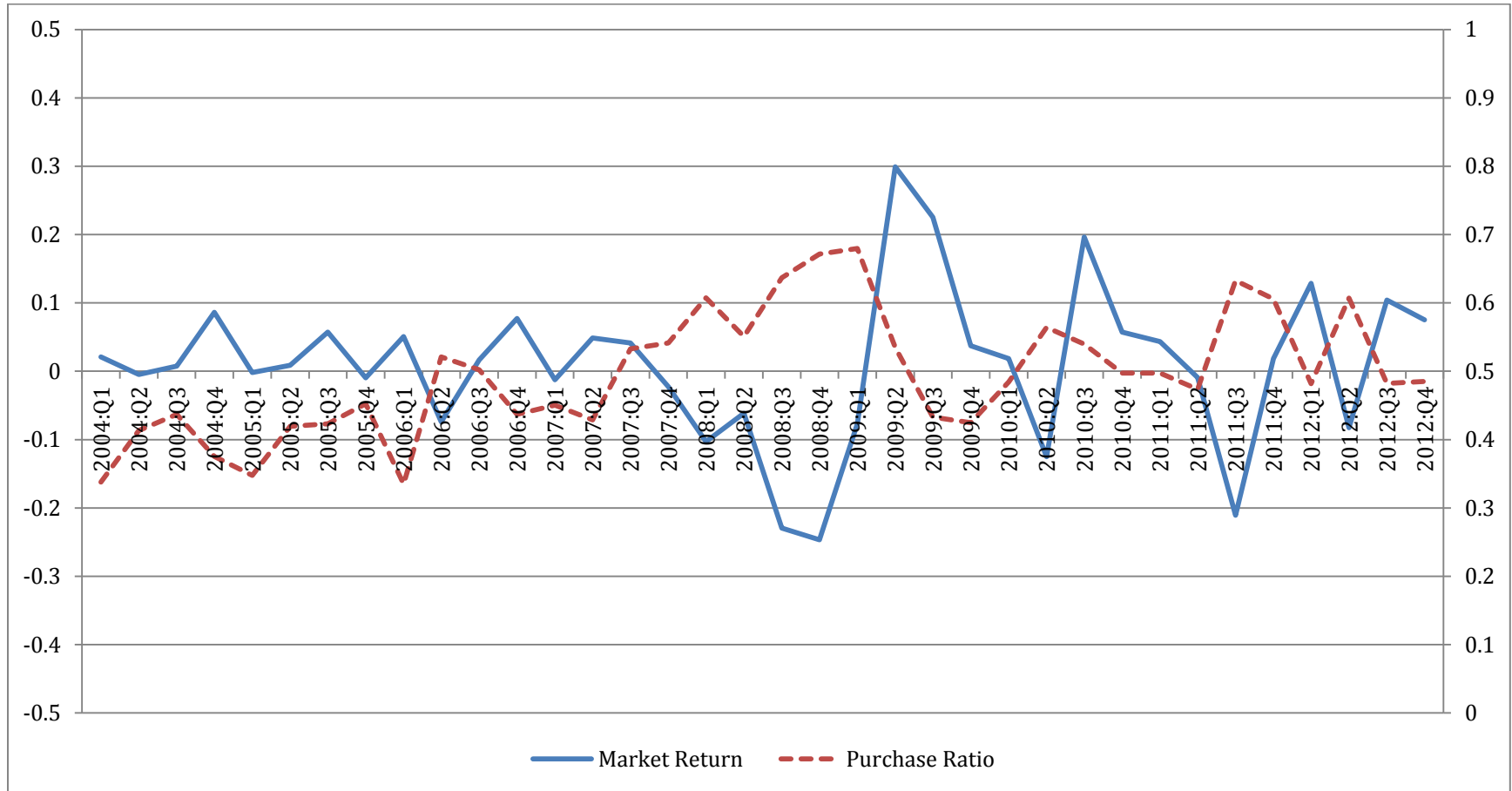
Panel A: Future GDP Growth				
GDP Growth $_{t+1,t+2}$	(1)	(2)	(3)	(4)
<i>Insider Trading Signals</i>				
Purchase Ratio	0.00 (0.07)			
Purchase Ratio _{weighted}		-0.01 (-1.08)		
Net Purchases			0.09* (1.83)	
\$ Purchases				0.20*** (4.41)
\$ Sales				-0.03 (-0.76)
<i>Market Factors</i>				
Market Return $_t$	0.14*** (3.33)	0.14*** (3.50)	0.14*** (3.66)	0.14*** (3.69)
Market Return $_{t-1}$	0.00 (0.15)	0.00 (0.10)	0.00 (0.17)	-0.00 (-0.04)
World Return $_t$	-0.39*** (-3.55)	-0.39*** (-3.36)	-0.38*** (-3.20)	-0.38*** (-3.19)
M/B Ratio	0.01 (1.38)	0.01 (1.46)	0.01 (1.47)	0.01 (1.49)
Market Capitalization	-0.00 (-0.20)	-0.00 (-0.19)	-0.00 (-0.29)	-0.00 (-0.35)
Liquidity	0.15 (1.20)	0.14 (1.18)	0.15 (1.26)	0.15 (1.24)
<i>Other Signals</i>				
Dividend Yield	0.43** (2.09)	0.44** (2.14)	0.47** (2.33)	0.47** (2.24)
Inflation	-0.39 (-0.91)	-0.39 (-0.90)	-0.38 (-0.87)	-0.39 (-0.92)
Δ Institutional Holdings	0.08 (0.27)	0.07 (0.20)	0.09 (0.31)	0.09 (0.30)
Net Guidance	-0.02 (-0.29)	-0.06 (-0.57)	-0.03 (-0.35)	-0.03 (-0.39)
Net Forecasts	-0.01 (-0.61)	-0.01 (-0.67)	-0.01 (-0.54)	-0.01 (-0.51)
<i>Past GDP and GDP growth</i>				
GDP Growth $_t$	-0.27*** (-6.83)	-0.27*** (-6.56)	-0.27*** (-6.75)	-0.27*** (-6.88)
Log GDP	-0.10** (-2.40)	-0.10** (-2.57)	-0.10** (-2.60)	-0.10** (-2.72)
Fixed Effects	Country & Quarter	Country & Quarter	Country & Quarter	Country & Quarter
Observations	691	691	691	691
R-Square	38.54%	38.70%	38.79%	39.10%

Table 7 (cont'd)

Panel B: Future Changes in Earnings				
$\Delta ROE_{t-1,t+3}$	(1)	(2)	(3)	(4)
<i>Insider Trading Signals</i>				
Purchase Ratio	0.01 (0.51)			
Purchase Ratio _{weighted}		-0.00 (-0.22)		
Net Purchases			-0.00 (-0.08)	
\$ Purchases				0.04 (0.52)
\$ Sales				0.04 (0.55)
<i>Market Factors</i>				
Market Return _t	0.01 (0.24)	0.01 (0.21)	0.01 (0.20)	0.01 (0.14)
Market Return _{t-1}	0.04 (0.68)	0.04 (0.68)	0.04 (0.67)	0.04 (0.59)
World Return _t	-0.11 (-0.61)	-0.11 (-0.63)	-0.11 (-0.62)	-0.11 (-0.61)
M/B Ratio	-0.03* (-1.84)	-0.03* (-1.81)	-0.03* (-1.80)	-0.03* (-1.77)
Market Capitalization	0.06** (2.40)	0.06** (2.41)	0.06** (2.37)	0.06** (2.31)
Liquidity	0.01 (0.71)	0.01 (0.73)	0.01 (0.70)	0.01 (0.72)
<i>Other Signals and Controls</i>				
Dividend Yield	-0.06 (-0.14)	-0.05 (-0.12)	-0.06 (-0.13)	-0.07 (-0.15)
Inflation	0.02 (0.08)	0.03 (0.12)	0.03 (0.12)	0.04 (0.13)
Δ Institutional Holdings	-0.47 (-0.97)	-0.47 (-0.98)	-0.47 (-0.98)	-0.48 (-1.00)
Net Guidance	0.06 (0.35)	0.05 (0.29)	0.06 (0.34)	0.06 (0.35)
Net Forecasts	0.02 (1.19)	0.02 (1.11)	0.02 (1.12)	0.02 (1.14)
ROE _{t-1}	-0.60*** (-4.30)	-0.61*** (-4.08)	-0.61*** (-4.21)	-0.60*** (-4.18)
Fixed Effects	Country & Quarter	Country & Quarter	Country & Quarter	Country & Quarter
Observations	567	567	567	567
R-Square	54.95%	54.92%	54.91%	54.98%

Notes: This table reports regression results where the dependent variable is either future growth in GDP measured over the next two quarters at the country level (Panel A), or aggregate change in country-level return on equity, measured over the next four quarters (Panel B). The independent variables include country-level insider trading signals aggregated over the quarter, contemporaneous market-level risk measures (world factor, momentum, aggregate market-to-book ratio, country-level market cap and share turnover), additional country-level signals (dividend yield, inflation, change in institutional holdings, number of positive minus negative earnings forecast revisions issued by firms and analysts) and control variables (current GDP growth, logged level of GDP in Panel A, and lagged level of ROE in Panel B). All regressions include country and calendar quarter fixed effects. Variables are defined in greater detail in the Appendix. Coefficients and t-statistics based on standard errors clustered by country are reported. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 level.

Figure 1: Graph of Purchase Ratio and Market Return



This graph plots quarterly time-series for the average country-level market return and insider purchase ratio weighted by logged country market capitalization between the first quarter of 2004 and the fourth quarter of 2012. The y axis for market returns is on the left; the one for the purchase ratio is on the right. The sample includes up to 39 countries, depending on the time period.