The Relationship Insurance Role of Financial Conglomerates:

Evidence from Earnings Announcements

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Abstract

This paper uses earnings announcements to analyze the trading behavior and associated price impacts of institutions which have a lending or underwriting relationship with client firms and also hold client firms' shares. Buying support from relationship institutions surrounding negative earnings surprises mitigates the negative impact on client firms' stock prices. Support by relationship institutions is also associated with less selling by independent institutions holding the same client firms' shares. Price reactions for firms without relationship institutions are significantly larger. Price support from relationship institutions appears to help resolve uncertainty accompanying clients' temporary earnings shocks, thus reducing noise in capital markets.

JEL Classification: G12, G14, G21, G24

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1. Introduction

Institutional investors play increasingly important roles in financial markets and their actions may have diverse effects on both firms and market prices. For example, Chen, Harford, and Li (2007) document the monitoring role of institutional investors, while Cella, Ellul, and Giannetti (2013) provide evidence of price pressure created by short-term trading by institutional investors during times of market turmoil. Allen, Morris, and Shin (2006) demonstrate theoretically that a stock's price can deviate from its liquidation value when traders are motivated to second- and third-guess other traders to profit from short-run price movements. In their model, even long-lived traders with a preference for smoothing consumption over time will care about short-run price movements. It follows that firms' managers may have a desire to maintain smooth stock prices.

In light of the above discussion, this paper proposes a price support role for a special type of institutional investor which we term a "relationship institution". This is defined as an institutional investor which has a lending or underwriting relationship with a client firm and also holds the client's equity. We hypothesize that, given the fees or interest payments collected from client firms, relationship institutions may have an incentive to support clients' stock prices when they are subject to short-term price pressure. Relationship institutions, as long term business partners, can strengthen their relationships with client firms by purchasing clients' stocks especially during periods of selling pressure by other types of institutions.

The prevalence of this type of relationship has increased dramatically due to regulatory change. The gradual relaxation of the Glass-Steagall Act, culminating with passage of the Gramm-Leach-Bliley Act in 1999 has resulted in complex relations among diverse financial

institutions (Lown, Osler, Strahan, and Sufi, 2000).[1] These relationships and their consequences for the functioning of capital markets have also attracted wide attention by researchers. It is not uncommon for a financial conglomerate to both aid a firm in fund raising (either lending, IPO or SEO equity financing) and invest in the same firm's equity through one or more of its asset management subsidiaries. These financial institutions have economies in acquiring and producing information on their client firms as a byproduct of their lending/underwriting relationships. By exploiting economies of scale and scope, financial institutions can accumulate information they produce and share this information firm-wide. For example, Acharya and Johnson (2007) show evidence of the use of information by informed banks in the credit default swap market. Massa and Rehman (2008) find that the mutual funds affiliated with banks increase their portfolio weights in the firms borrowing from these banks, enhancing fund performance by an average of 1.4% per year. Connections among subsidiaries also create complex sets of incentives that can reasonably be expected to affect behaviors.

To test for the potential of relationship institutions to support client firms' stock prices, we examine the trading behavior and resulting price impacts of relationship institutions surrounding earnings announcements. These announcements offer a convenient opportunity to examine institutional trading behavior surrounding the public release of client firm information. The regular frequency of earnings announcements facilitates our analysis by providing a large sample over a wide variety of business conditions. Our setting helps to avoid the selection bias issues that may be involved in irregular corporate events such as capital raising or mergers. This

[1] The repeal process began in 1987. Banks were required to submit individual applications to establish Section 20 Subsidiaries. For more details, see J.P Morgan & Co. Inc., The Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp., Federal Reserve Bulletin 75 (1989): 192-217. See also Federal Register 61 (1996), pages 68750-68756 for subsequent relaxation of the rules.

setting also captures the long-term nature of relationships between client firms and institutions more clearly than infrequent corporate events. Furthermore, earnings announcements are associated with various market anomalies. We believe the findings in this paper can help to shed some light on these anomalies.

To test our hypotheses, we analyze the stock trading patterns of two different types of financial institutions: relationship institutions and independent institutions. We define relationship institutions as those that hold shares of firms that they have also served as either lenders or underwriters within a three-year period prior to these client firms' earnings announcements. Other institutions holding these same firms shares are classified as independent institutions.

Following the literature discussed above, we formally analyze institutional trading and related stock price impacts by contrasting two hypotheses: the relationship insurance hypothesis and the information exploitation hypothesis. The relationship insurance hypothesis predicts that relationship institutions will tend to support their clients' stock prices by increasing holdings of clients' shares surrounding short-term negative earnings shocks. If such price support activities are effective, firms having relationship institutions should have smaller price reactions to negative earnings surprises than firms without support. On the contrary, the information exploitation hypothesis suggests that relationship institutions will exploit the private information obtained from their affiliated banks to improve their performance. In this case, relationship institutions will reduce their holdings before their client firms announce negative earnings surprises.

Our findings are consistent with the relationship insurance hypothesis. We find that relationship institutions increase their holdings of clients' shares while independent institutions

reduce their holdings surrounding negative earnings surprises. We also contrast the shareholding patterns of independent institutions across two classifications of firms—those with relationship institutions (connected firms) versus those without relationship institutions (unconnected firms). Interestingly, we observe that independent institutions more aggressively reduce their holdings of unconnected firms (by nearly five times) relative to those of connected firms. These findings suggest that relationship institutions, on average, support their clients when negative earnings surprises occur, possibly signaling the unobserved strength of client firms to the market. These activities by relationship institutions also appear to discourage the selling of connected firms by independent institutions. The behavior of independent institutions is consistent with the fact that both the announcement effect and post-earnings-announcement drift are lower for connected firms, thus presenting a less profitable trading strategy relative to unconnected firms.

The comparison between connected and unconnected firms, however, raises the concern that the results discussed above are driven by the heterogeneity between these two types of firms. Therefore, we turn to within-firm variation and analyze a subset of firms whose relationship institutions have held their stocks for at least one quarter. To formally account for serial correlations and the endogeneity problems of several key variables, we utilize dynamic panel models estimated by following Blundell and Bond (1998). The findings from this restricted sample and rigid empirical method confirm our previous observations using a broader sample.

To examine the effects of institutional trading even more closely, we construct a price support (PS) measure (described in Section 4.3) designed to jointly capture both the magnitude of buying or selling activity and the sign and magnitude of earnings surprises over a four quarter window. We calculate this PS measure for relationship institutions and independent institutions

and examine whether price impacts differ when connected firms are traded by relationship versus independent firms.

First, we find that relationship institutions provide more price support for client firms' stocks than independent institutions when the firms experience negative earnings shocks. Interestingly, price support of these client firms by independent institutions, albeit smaller in magnitude, suggests that the presence of relationship institutions appears to encourage independent institutions to buy shares. Second, independent institutions do not support unconnected firms, and in fact strongly sell when measured by PS. This is consistent with the finding that the earnings surprise and momentum effects are stronger among unconnected firms.

To further examine the effects of trading by relationship and independent institutions, we analyze hedge portfolio (buy-minus-sell) returns by sorting on our PS measure for firms with negative average earnings surprises. Specifically, we go long the extreme-buy quintile portfolio and short the extreme sell quintile portfolio. Interesting patterns emerge. For independent institutions, hedge portfolio returns are significantly positive during the PS construction period, but turn significantly negative following this period, suggesting that trading by independent institutions is not driven by long-lived fundamental information but instead is based on short-term price movements.

By contrast, hedge portfolio returns for relationship institutions are either insignificant or significantly negative both before and after the PS construction period. Surprisingly, client firms that are sold by their relationship institutions perform significantly better than those that are purchased, even during the PS construction period. Relationship institutions appear to sell client firms that can rebound by themselves. Our findings are consistent with Griffin, Shu, and

Topaloglu (2012) who find no evidence that relationship institutions trade on inside information for short-term profits.

Our paper demonstrates the association of independent institutions' trading with momentum and reversal, which are considered among the most prominent anomalies in financial markets by Vayanos and Woolley (2013). They build a theoretical model based on a negative shock to asset value that triggers fund outflows and further selling by the fund manager resulting in a temporary negative deviation of asset prices from fundamental value. Similarly, we show that the trading of independent institutions appears to push stock prices below their fundamental values when firms experience temporary negative earnings shocks.

We further document that the presence of relationship institutions seems to mitigate the impact of selling pressure by independent institutions. We contribute to the literature on financial institutions by providing evidence of a relationship insurance role in the capital markets for a broad sample of firms using regular and frequent earnings announcements as the conditioning event. These findings may also have more general implications for the asset pricing literature. Support by relationship institutions appears to alter the stock return profile around negative earnings surprises by smoothing out temporary negative earnings shocks. Firms without such support experience wider temporary price swings. If relationships among institutions can reduce unnecessary price movements and discourage short-term trading, less noise in financial markets could be considered welfare enhancing.

The remainder of this paper is organized as follows. Section 2 develops our hypotheses. Section 3 describes the data and research design. Section 4 reports the empirical results for institutional trading behavior, abnormal stock returns at the earnings announcement, subsequent earnings momentum, degree of price support, and hedge portfolio returns. Section 5 concludes.

2. Hypothesis Development

2.1 The Roles and Incentives of Financial Conglomerates

Numerous studies explore various aspects of connections within financial conglomerates and with their client firms. Ellis, Michaely and O'Hara (2000) examine the price support activities of IPO underwriters and find that market markers within a financial group tend to support the stock prices of IPO firms underwritten by investment banks within the same group. Hao and Yan (2012) find that investment bank-affiliated mutual funds underperform unaffiliated funds because they hold relatively large amounts of clients' underperforming IPO and SEO shares. Potential banking fees collected from client firms provide incentives for financial firms to support the stock prices of their clients to help maintain their banking relationships.

Chan, Karceski and Lakonishok (2007) claim that analysts may issue favorable investment opinions to curry favor with executives who can direct future investment banking business to the analysts' firms. Yasuda (2005) also shows that lending relationships have a significant and positive effect on a firm's underwriter choice, particularly for junk-bond issuers and first-time issuers. Reuter (2006) documents a robust positive correlation between the annual brokerage payments that mutual fund families make to lead underwriters and the IPO allocations to these families. Ferreira and Matos (2012) also report that strong bank-firm relations (board seats, direct equity stakes or through institutional holdings) increase a bank's probability of being picked as lead syndicate arranger. The above stream of literature highlights the quid-pro-quo that seems to exist among financial firms and their subsidiaries.

Although regulators and market participants have expressed concern about the information spillover within financial conglomerates and have required them to erect "Chinese Walls" to prevent abuses, evidence from prior studies suggests that Chinese Walls may not be

totally effective. This second strand of literature focuses on the informational advantages of combined business lines. Ivashina and Sun (2011) find that institutions participating in loan renegotiations subsequently trade the same firms' stocks and outperform a comparison group by 5.4% per year. Chen and Martin (2011) also suggest an information spillover from the commercial lending division to the equity research division in financial conglomerates. For those clients with a lending association, bank affiliated analysts exhibit greater EPS forecast accuracy compared with independent analysts.

Dass and Massa (2011) argue that a strong bank-firm relationship has offsetting effects. Firms benefit through better corporate governance, but suffer reduced liquidity due to higher adverse selection perceived by other non-connected institutional shareholders. These findings are consistent with our proposition that relationship institutions can support clients' stock prices. Such actions may discourage short-term trading. Our paper thus adds to the above literature by providing evidence on the role of financial conglomerates as supportive institutional investors.

2.2 Institutional Investors and Earnings Surprises

Besides the special incentives of relationship institutions, investing for monetary gain is ultimately the primary goal of an institutional investor. However, their strategies and information sources may vary.

One strand of literature focuses on investment horizon, i.e., short-term versus long-term investors. Yan and Zhang (2009) find that stocks experiencing the largest increase in short-term institutional holdings have significantly higher earnings surprises and earnings announcement abnormal returns over the subsequent four quarters versus stocks experiencing the largest decrease in short-term institutional holdings. Such patterns do not exist among the findings for

long-term institutional holdings. Yan and Zhang (2009) conclude that institutions with a short-term focus possess more information than those with a long-term focus.

In contrast to Yan and Zhang (2009), we focus on the differences between relationship institutions and independent institutions. Relationship institutions can be considered long-term investors and their investment horizons are possibly specific to their client firms. We use the existence of relationships rather than a portfolio turnover rate used to classify institutional investors by several studies, such as Yan and Zhang (2009) and Cella, Ellul, and Giannetti (2013). The previously cited literature also suggests that relationship institutions are informed. However, if their trades are not driven by short-term profit taking due to temporary earnings shocks, then the analysis of their trading will be inappropriate to infer whether relationship institutions are more informed. In fact, using mergers and acquisitions as events, Chen, Harford, and Li (2007) show that long-term independent institutions only trade when there are very bad outcomes.

Other studies using earnings announcements to examine institutional trading include Baker, Litov, Wachter, and Wurgler (2010) and Jiang and Zheng (2014). Baker et al. (2010) find evidence that aggregate mutual fund trading forecasts earnings surprises. However, predictability is reduced following the passage of SEC Regulation Fair Disclosure. Our study, on the other hand, offers another possible explanation that price support from relationship institutions can also discourage trading for profit from short-term earnings shocks.

2.3 Hypotheses

Relationship institutions and independent institutions may have different incentives, information sets, and trading behaviors for the firms whose shares they own. We presume that all

institutions have incentives to make optimal investment decisions. However, the considerations for relationship institutions are broader than just trading profits. They also have an incentive to maintain good relations with their client firms, and may simultaneously enjoy an informational advantage over their non-connected rivals. The banking fees paid by corporate clients and future possible business opportunities provide potentially strong incentives for banks to maintain long-term relationships with their clients.

Because of information asymmetry in markets, firms suffering from temporary negative earnings shocks may not be able to credibly convey favorable information to outsiders. Thus, relationship institutions may play a role in certifying their client firms in the event of such transitory shocks. One possible strategy is for relationship institutions to increase their equity holdings in client firms, signaling their positive views to the market. If relationship institutions are successful, stock price reactions to negative earnings surprises will be smaller and post-earnings announcement drift will be less pronounced than otherwise. We refer to this scenario as the relationship insurance hypothesis. Conversely, relationship institutions may choose to exploit the private information obtained from their affiliated banks to improve their investment performance. If this is true, relationship institutions should sell shares before bad news, possibly magnifying the price reaction to negative earnings surprises. We refer to this scenario as the information exploitation hypothesis.

3. Data, Research Design and Univariate Results

3.1. Data Sources

Our sample consists of all common stocks listed on NYSE, AMEX and NASDAQ from 1990 to 2004 with CRSP share codes 10 or 11. Closed-end funds, real estate investment trusts

(REITs), American Depository Receipts (ADRs), and foreign listings are eliminated from the sample. We collect quarterly institutional holdings data from Thomson Financial CDA/Spectrum institutional (13f) holdings. Institutional holdings greater than 10,000 shares or $200,000 are reported to the Securities and Exchange Commission (SEC) on form 13-f and CDA/Spectrum collects information from these filings. Bond and equity underwriting information comes from the Thomson Financial SDC/Platinum new issues database. We obtain loan deal and lender information from Thomson Financial Reuter's LPC Dealscan. Quarterly earnings announcement information is from the I/B/E/S Summary database. Stock prices, returns, and shares outstanding are obtained from CRSP. Finally, firm characteristics are from Compustat.

To test our hypotheses, we divide all institutional investors into two types: relationship institutions and independent institutions. Following popular terminology we will typically refer to diversified financial institutions as banks. If a bank has a lending or underwriting relationship with a client firm, any of the bank's affiliated institutions that hold shares of this client firm are defined as this firm's "relationship institutions". Other institutions owning the same firm's shares but whose affiliated groups do not have lending or underwriting relationships are defined as "independent institutions". We use a three year window prior to an earnings announcement to classify institutions.[2] For example, if Smith Barney underwrote an SEO for IBM within the past three years, Citigroup is classified among IBM's relationship institutions since Smith Barney and Citigroup belong to the same conglomerate group. On the other hand, if J.P. Morgan holds shares of IBM without a lending or underwriting relationship, J.P. Morgan is classified as an independent institution for IBM. Because there are numerous mergers and acquisitions (M&A)

[2] As relationships tend to turn over slowly, use of windows up to five years produce very similar results.

among relationship institutions during our sample period, to correctly identify relationships these transactions are gathered from the Thomson Financial SDC/Platinum M&A database.

We also divide all firms held by banks in our study into two types: “connected firms” and “unconnected firms”. Connected firms (e.g. IBM) are those firms paying banking fees to their relationship institutions within the past three years. Unconnected firms are those without any relationship institutions. A firm is unconnected if it has not used the services of a bank within the past three years, or if so, none of the bank’s affiliates own shares in the firm.

To identify client equity held by relationship institutions we match (by hand) data on the lenders from LPC/Dealscan and underwriters from SDC/Platinum to institutional holdings in CDA/Spectrum. Over our sample period there are more than 10,000 institutional investors’ names in CDA/Spectrum and about 10,000 lender and underwriter names. All names are corrected for changes in parent holding company names by incorporating M&A information. Due to the magnitude of the effort required to hand-match banks by name, we focus only on those with brokerage services, which includes most financial conglomerates. Finally, the institutional holdings data are merged with the I/B/E/S, CRSP, and Compustat data by Cusip.

3.2 Empirical Design

We conduct two sets of analyses that differ in the scope of sample used in the tests. In the first set of tests, discussed in Section 3.2.1, we investigate both connected and unconnected firms by following empirical strategies that are more comparable to the existing literature. In the second set of tests, outlined in Section 3.2.2, we focus only on firms that have had at least one relationship institution over our sample period. We do this to mitigate concerns regarding endogenous selection to some extent. For this more homogeneous sample, we employ dynamic

panel methods to formally address serial correlations and endogeneity of several key variables as well as unobserved firm fixed effects.

3.2.1 Analysis of connected firms versus unconnected firms

We first explore the trading behavior of relationship and independent institutions in shares of connected firms surrounding earnings announcements using univariate tests reported in Section 3.3. By definition, unconnected firms only have independent institutions for analysis. Given our data limitations, we infer the extent of buying or selling each quarter surrounding earnings announcements by calculating changes in institutional holdings as reported in SEC form 13-f. We discuss the implications and limitations of the data coarseness below.

We then use event study methods to examine whether abnormal returns around earnings announcements differ between connected and unconnected firms. Daily cumulative abnormal returns (CARs) for the announcement period (-1, +1) are computed with the market model using an estimation period of days -255 to -10 relative to each earnings announcement. Unreported findings using market-adjusted returns and/or CAR (0, +2) produce nearly identical results. To study the relation between announcement period CARs and various characteristics of the announcing firms, we use panel regressions with fixed effects.[3] The dependent variable is CAR (-1, +1). The model is expressed as:

$$\begin{aligned} CAR_{it} &= \beta_0 + \beta_1 Dum\_rela_{it-1} + \beta_2 Size_{it-1} + \beta_3 (B/M)_{it-1} + \beta_4 SUE_{it-1} \\ &+ \beta_5 Age_{it-1} + \beta_6 Err_{it-1} + \beta_7 Numest_{it-1} + \beta_8 Stdev_{it-1} + \beta_9 Cum\_return_{it-1} + v_i + e_{it} \end{aligned} \quad (1)$$

[3] We also estimate Fama-Macbeth (1973) cross-sectional regressions for each quarter. The results are robust and thus not reported for brevity.

where v_i is a fixed effect for firm *i* and e_{it} is the residual. The v_i and e_{it} are assumed to be independent for each *i* over all *t*. The appendix lists the definitions of all variables. The primary coefficient of interest is β_1, which indicates whether having relationship institutions matters. Dum_rela_{it} is a dummy indicator that equals 1 if firm *i* is connected (has one or more relationship institutions) at time *t* and 0, otherwise. Alternatively, we use a discrete variable Re_num_{it}, which is the number of relationship institutions for firm *i* at time *t*. The earnings surprise as defined by Chordia and Shivakumar (2006) is the current quarter's standardized unexpected earnings for firm *i* as follows:

$$SUE_i = \frac{\text{Quarterly earnings - Expected quarterly earnings}}{\text{Standard deviation of earnings changes over the prior eight quarters}} \quad (2)$$

Expected quarterly earnings are proxied by earnings four quarters previous to the current quarter. Our sample consists of 107,157 firm-quarter earnings announcements from 1990 to 2004.

A third set of tests examines whether earnings momentum differs between connected and unconnected firms based on quintiles of SUE. Prior literature has used a variety of methods to estimate expected quarterly earnings to construct SUE (Jones and Litzenberger, 1970; Latane and Jones, 1979; Bernard and Thomas, 1989; Chan, Jegadeesh and Lakonishok, 1996). However, Jegadeesh and Titman (2001) show that the accuracy of the earnings expectations model is not particularly important for the purpose of measuring unexpected earnings to predict momentum returns.

3.2.2 Linear Dynamic Panel-data Estimation and the Price Support Measure

It has been well documented that earnings surprises are serially correlated. If institutions trade based on the expectation and/or the realization of earnings surprises, then institutional

trading is also likely serially correlated. To properly address potential autocorrelations of our key variables of interest, we utilize dynamic panel models. Another important advantage of this approach is that the estimation procedure allows the inclusion of endogenous explanatory variables. Formally, the base model for our study has the following form:

$$y_{it} = \rho y_{i,t-1} + \sum_{j=1}^{J} \beta_j x_{jit} + \sum_{k=1}^{K} \gamma_k z_{kit} + v_i + e_{it} \qquad (3)$$

where $y_{i,t-1}$ is the lagged dependent variable, x_{jit} are exogenous variables, z_{kit} are endogenous variables, v_i is a fixed effect for firm i, and e_{it} is the residual. In some model specifications, we allow for higher-order lagged dependent variables and lagged independent variables.

The lagged dependent variables, by construction, are correlated with the firm fixed effect, making standard estimators inconsistent. Blundell and Bond (1998) propose a system estimator that uses additional moment conditions in which lagged differences are used as instruments for the level equation. This is in addition to the Arellano–Bond (1991) estimator, which uses moment conditions of lagged levels as instruments for the differenced equation. Flannery and Hankins (2013) evaluate several dynamic panel estimators using simulated data that resemble the common challenges found in corporate finance data. They conclude that Blundell and Bond (1998) estimators are the most robust and reliable. Therefore, we use this framework to formally examine institutional trading, stock market reaction, trading volume, and firm residual risk in Section 4.2.

In light of the serial correlations among earnings surprises and institutional trading, our final set of tests involve constructing a measure of price support (PS, described in section 4.3) to capture the interaction between trading intensity and the sign and magnitude of earnings surprises averaged over one-year intervals. We examine differences in price support for

connected and unconnected firms across SUE quintiles. We also contrast long-term cumulative abnormal returns surrounding earnings announcements associated with different levels of price support.

3.3 Summary Statistics and Univariate Tests

Table 1 provides median descriptive statistics for the sample firms in this study. Each quarter we divide all firms with earnings announcements into two groups (connected vs. unconnected firms) depending upon whether a firm's stock is held by at least one relationship institution prior to the announcement. Compared to unconnected firms, connected firms are larger, older and followed by more analysts. They also have higher median SUE, more positive forecast errors, and lower median book-to-market ratios. Regarding ownership variables, connected firms have higher ownership by institutions (61% vs. 45%) with about 1.1% owned by relationship institutions. Connected firms have a median of 3 (119) relationship (independent) institutional owners, while unconnected firms have a median of 53 independent owners. The only variable that is not significantly different between groups is the three-month cumulative return prior to each earnings announcement (*Cum_return*).

[Insert Table 1 here]

Table 2 presents a correlation matrix for the explanatory variables used in this study. Not surprisingly, Dum_Rela_i is highly correlated with Re_Num_i, $Size_i$, and $Numest_i$. Also, Re_Num_i is highly correlated with $Size_i$ and $Numest_i$. Connected firms are larger and have more analyst coverage. Also, older firms tend to have more relationship institutions.

[Insert Table 2 here]

To examine the trading behavior of relationship institutions and independent institutions around earnings announcements, we partition all announcements into quintiles each quarter based on SUE. Quintile 5 contains firms with the highest SUE and quintile 1 contains those with the lowest SUE. Results, reported in Table 3, reveal significant differences in trading between relationship and independent institutions. As a baseline for interpreting changes in holdings, Table 3 also reports average holdings as of the end of quarter 1. The actual earnings announcement occurs within the [0, 1] quarter.

We acknowledge that our analysis is somewhat limited by the coarseness of the holdings data. We do not directly observe institutional trading within the three-day earnings announcement window. However we note that especially relationship institutions may act on client firms' earnings before the actual announcement, and the trading by these institutions may be considered by independent institutions to be a signal of client firm quality. We address this issue in the section reporting our dynamic panel regression results.

Because we are interested in whether relationship institutions support their clients in the event of bad news, we focus our analysis on SUE quintile 1. However, we note in passing that for neutral to positive SUE (quintiles 3 – 5) both relationship and independent institutions tend to increase their holdings of both connected and unconnected firms prior to earnings announcements. This is consistent with a long-term trend of increased institutional holdings. Also, for all quintiles there is a continued buying trend after earnings announcements. The only exception is for quintile 5 where independent institutions, on average, sell connected firms following the most positive earnings surprises.

An interesting pattern emerges for the most negative SUE (quintile 1) firms. For connected firms, independent institutions significantly reduce their holdings prior to the

announcement, possibly due to negative precursors of bad earnings reports (selling -0.349%, -0.192% and -0.177% of announcing firms' shares outstanding in the three quarters preceding the negative SUE announcement). However, relationship institutions significantly increase their holdings prior to the announcement (buying 0.039%, 0.046% and 0.028% of clients' shares outstanding in the three quarters preceding the negative SUE announcement). Presuming that relationship institutions have information about their client firms that is at least as good as independent institutions, this behavior supports the relationship insurance hypothesis, and runs counter to the information exploitation hypothesis. This argument is further supported by the significant buying among independent institutions for several quarters following negative earnings announcements. The reversal of trading behavior by independent institutions surrounding negative earnings shocks suggests a transitory, perhaps momentum strategy. By contrast, relationship institutions do not significantly change their holdings following negative earnings surprises.

For unconnected firms in SUE quintile 1, independent institutions significantly reduce their holdings prior to earnings announcements. Interestingly, independent institutions sell unconnected firms much more aggressively than connected firms. Over the cumulative [-3, 0] window leading up to the earnings announcement, independent firms reduce their holdings of connected (unconnected) firms by 0.72% (1.76%) respectively. This is consistent with the notion that the observed behavior of relationship institutions serves as a signal that restrains the selling of connected firms by independent institutions prior to the announcements.

[Insert Table 3 here]

4. Empirical Results

In this section, we formally analyze the consequences of having relationship institutions in regression analyses. We first include both connected and unconnected firms in Section 4.1 and utilize fixed effects panel regressions (with clustered standard errors within a firm) to examine abnormal returns surrounding earnings announcements. We then follow traditional asset pricing literature to examine earnings momentum, which makes it easier for others to compare our study to exiting literature. To address serial correlations among key variables, the potential endogenous selection problem, and the heterogeneity between connected and unconnected firms, we analyze the subset of firms that have had at least one relationship institution over our sample period in Section 4.2 by using dynamic panel models.

4.1 Analysis of both Connected and Unconnected Firms

4.1.1 Abnormal Returns for Earnings Announcements

Table 4 examines three-day CARs for earnings announcements using firm fixed effects panel regressions. The dependent variable is the 3-day cumulative abnormal return (CAR (-1, +1)) surrounding the announcement day, using the market model. Table 4, Panel A presents results for all announcements. The primary result of interest is that the coefficient on the dummy variable representing the presence of at least one relationship institution (Dum_rela_i) is positive and significant at the 1% level in all specifications. For example, in Model 3 connected firms have a 0.33% (t-value = 4.04) higher CAR than unconnected firms. Further, in Model 4 the coefficient on Re_num_i shows that firms with one additional relationship institution have on average a 0.05% higher CAR (t-value = 4.6). However, to understand whether relationship

institutions provide supports to their clients, we need to focus on negative events. Therefore, we further split the sample into positive and negative earnings surprises.

Panel B shows results for positive earnings surprises. As in Panel A, the coefficient estimates on Dum_rela_i are positive and significant in all models. For example, in Model 3 connected firms have a 0.25% (t-value = 2.6) higher CAR than unconnected firms. Model 4 shows that for positive earnings surprises, firms with one additional relationship institution have on average a 0.05% higher CAR (t-value = 3.73). A more optimistic response to positive earnings surprises when companies have relationship institutions could be the result of the certification effect. For example, Puri (1996) shows that investors are willing to pay relatively higher prices for securities underwritten by commercial banks than by investment banks due to the issuing firms having closer or longer term relationships with commercial banks.

Panel C provides results for negative earnings surprises. As before, the coefficient estimates on Dum_rela_i are positive and significant in all models. For example, in Model 3 connected firms have a 0.56% (t-value = 3.28) higher CAR than unconnected firms. Model 4 shows that for negative earnings surprises, firms with one additional relationship institution have on average a 0.06% higher CAR (t-value = 2.56). These results indicate that connected firms have a significantly smaller (negative) price impact than unconnected firms when negative earnings surprises occur.

Comparing positive and negative surprises provides some insight regarding the relationship insurance hypothesis. First, as is well known, the market is more sensitive to negative surprises. This is confirmed by comparing the coefficients on SUE_i in Model 3, Panels B and C (0.00261 vs. 0.00506). In our sample the market is twice as sensitive to negative versus positive surprises. Second, the impact of the presence of at least one relationship institution is

greater for negative versus positive surprises. For example, the estimated coefficient of Dum_rela_i in Model 3 of Panel C is roughly double that of Panel B (0.0056 vs. 0.0025). These findings are consistent with the relationship insurance hypothesis. It is more important for relationship institutions to support their clients' stock prices when these clients experience negative earnings shocks. Finally, coefficients on the remaining control variables are significant and broadly consistent with the literature on earnings announcements (see, for example, Berkman, Dimitrov, Jain, Koch, and Tice, (2009)).

[Insert Table 4 here]

4.1.2 Earnings Momentum

In this section we use standard methodology (see Chan, Jegadeesh and Lakonishok, 1996; Jegadeesh and Titman, 1993) to examine post-earnings announcement momentum (drift) for connected and unconnected firms. Each month, we categorize firms as connected or unconnected and then sort them into quintiles based on SUE from their most recent earnings announcements. Firms in Portfolio SUE1 have the lowest SUE (negative surprises) and firms in portfolio SUE5 have the highest SUE (positive surprises). We then examine average monthly raw returns over one, three and six month holding periods following the earnings announcement.

Panel A of Table 5 shows that for unconnected firms the average difference in returns between SUE5 firms and SUE1 firms is a statistically significant 1.55% (t-value = 5.91) over a one month holding period. By contrast, the difference for connected firms is an insignificant 0.41% (t-value = 1.39). Also, the difference in momentum between connected and unconnected firms is a statistically significant -1.14% (t-value = -5.37). For three and six month holding periods, average monthly momentum returns decrease for unconnected firms, but they remain

statistically significant. For connected firms, the momentum effect actually becomes negative, though it remains insignificant. Importantly, for all horizons, momentum for unconnected firms is significantly greater than for connected firms. To interpret these results, we note that momentum returns for unconnected firms are similar to those in the literature (Chan, Jegadeesh and Lakonishok, 1996; Jegadeesh and Titman, 1993). However, for connected firms, momentum returns are less pronounced. Returns for low (negative) SUE1 firms are higher, while returns to high (positive) SUE 5 firms are lower. This pattern is consistent with the relationship insurance hypothesis if the market response to buying by relationship institutions is stronger when client firms experience negative earnings surprises.

[Insert Table 5 here]

4.2 Analysis of the Subset of Firms That Have Had at Least One Relationship Institution

The direct comparison of connected and unconnected firms thus far may suffer from a sample selection problem. It is possible that the observed differences in trading behavior, short run and long run returns surrounding earnings announcements may be driven by unobserved differences in firm characteristics between connected and unconnected firms, rather than by the deliberate actions of relationship institutions. Therefore, in this section, we examine the subset of connected firms that have one or more relationship institutions that have held their shares for at least one quarter. In addition, we use dynamic panel regressions to address the serial correlations and endogeneity problems among several key variables.

4.2.1 The Level of Ownership by Institutional Investors

It is well documented that institutional trading is serially correlated (see, for example, Sias (2004)). To understand the potential interactions among the activities of different types of

institutions, we regress either the level of holdings or the volume of trading of one type of institution on the other type. These variables are likely endogenous and correlated with panel-level fixed effects and error terms. Another possible endogenous variable is CAR [-1, 1] because institutions may trade based on expected and/or realized stock market reactions. Therefore, traditional estimators are inconsistent. To address these issues, we use the system estimators developed by Blundell and Bond (1998).

The first two regressions in Table 6 report the analysis of the level of ownership by relationship institutions and independent institutions, respectively. We note that holdings data and some firm characteristics, such as book to market, are available at the end of each quarter. However earnings announcements occur randomly within a quarter. As a convention, we label both holdings and the most recent earnings announcement using the same time indicator *t*. Therefore, the dependent variables can be up to two months later than the most recent earnings announcement.

[Insert Table 6 here]

The first variable of interest is whether the most recent earnings surprise is negative (NEG=1 if negative SUE). Column (1) shows that the level of relationship holdings is significantly higher (0.06% of ownership) when firms experience a negative SUE rather than a positive SUE. However, the corresponding estimate in Column (2) indicates an insignificant difference for independent holdings. We also report fixed effects models in Columns (3) and (4) as a comparison, but we rely mainly on the results from the dynamic panel. Fixed effect estimators show insignificant coefficients for relationship holdings but significantly negative coefficients for independent holdings. Both models indicate “relative” buying of relationship

institutions' shares in comparison to independent institutions when firms experience negative earnings surprises.

As expected, lagged dependent variables are significantly positively correlated with their current values. We report higher levels of lagged variables if their coefficients are significant. The Blundell and Bond (1998) estimators require that the first-differenced errors are not serially correlated at the second order or higher. At the bottom of Table 6, we report the z-tests of second order autocorrelation. None of the tests are significant indicating the validity of using the current approach.

Next we examine changes in holdings and their interactions with the indicator for negative earnings surprises. The significant positive coefficients on $Change\_Ind\_Pct_t$ and $Change\_Rel\_Pct_t$ in Columns (1) and (2), respectively, suggest that the level of institutional ownership is higher for a given institution type (relationship or independent) if the other type of institution increases holdings during the quarter when firms experience positive SUEs. However, when firms experience a negative SUE, the estimated coefficients on the interaction terms turn significantly negative. We further test whether the sum of the coefficients (change in holdings and its interaction with a negative SUE) is significantly negative. The Wald statistics reported at the bottom of Table 6 is significant for relationship holdings but insignificant for independent holdings. These results are consistent with the explanation that relationship institutions purchase clients' shares in response to the selling by independent institutions, not the other way around. Otherwise, the Wald test in Column (2) would be significant for independent holdings as well. Because we scale all coefficients by a factor of 100, the sum of 5.35 and -10.3 in Column (1) means that if independent institutions sell 1% of clients' outstanding shares, relationship holdings increase by 0.05%. Given the average market value of $1,144 million for connected

firms, this suggests that relationship institutions hold on average $0.57 million more equity of a client firm in response to $11.44 million of selling by independent institutions.

These results are consistent with the findings documented in Campbell, Ramadorai, and Schwartz (2009). They find an asymmetry in short-term return reversals following institutional trades, i.e., next-day returns are significantly positive for institutional sales but not significantly negative for institutional purchases. They interpret these results as support for an implicit payment by liquidity-demanding institutions to liquidity providers. In our paper, we show additionally that such liquidity can be provided by a relationship institution.

The level of independent holdings is significantly positively associated with the most recent 3-day stock market reaction (CAR [-1, 1]) regardless the sign of SUE. However, a similar relation does not hold for relationship holdings. Both types of institutions prefer to hold larger firms and firms followed by more analysts but show different preference along the dimensions of past stock returns and residual risk. Independent holdings are significantly positively associated with the prior 3-month cumulative stock return but negatively associated with residual risk. Both coefficients are insignificantly different from zero for relationship holdings.

4.2.2 The Trading Activities of Institutional Investors

As a robustness test, in Table 7 we repeat our analysis of the level of holdings using changes in holdings. The estimated coefficients on NEG indicate that relationship institutions significantly increase their holdings by 0.04%, while independent institutions significantly reduce holdings by 0.54% when firms experience negative earning surprises. The estimated coefficients on lagged dependent variables show that both types of institutions tend to reverse trading directions.

Regarding how different types of institutional investors trade against or with each other, we obtain results similar to those reported in Table 6. Specifically, when firms experience a positive SUE, there is a significantly positive coefficient on changes in holdings regardless of the type of institution (institutions trade in the same direction). When firms experience negative earnings surprises independent and relationship institutions trade in opposite directions. In response to a sale of 1% of outstanding shares by independent institutions, relationship institutions, on average, increase holdings by about 0.05% (the sum of 2.72 and -7.4). Again, the Wald test reported at the bottom of Table 7 is highly significant at 1% level. On the contrary, the test for independent institutions is insignificant. These findings confirm the conclusions from Table 6 that relationship institutions respond to independent institutions but not the other way around.

[Insert Table 7 here]

4.2.3 Trading Implications for Future Earnings Surprises

To further understand the trading incentives of institutions, we now turn to an analysis of subsequent earnings surprises reported in Table 8, Column (1). If institutions exploit their informational advantages, they are likely to increase holdings prior to positive earnings surprises. However, the relationship insurance hypothesis would posit the opposite. The significantly negative estimated coefficients on $Change\_Rel\_pct_{t-1}$ and Rel_pct_{t-2} indicate that the trading behavior of relationship institutions is consistent with the relationship insurance hypothesis. On the other hand, the insignificant estimated coefficients on $Change\_Ind\_pct_{t-1}$ and Ind_pct_{t-2} suggest that there is no additional information content in the trading and the lagged holdings of independent institutions.

The estimates on lagged dependent variables have the expected positive signs, i.e., earnings surprises are positively serial correlated. Larger, high book to market, younger, and firms followed by more analysts tend to have lower SUEs. Firms with higher prior 3-month cumulative stock returns and higher forecast dispersion tend to have significantly higher SUEs.

In the second column of Table 8, we reexamine 3-day stock market reactions surrounding earnings announcements. The variables of interest are SUE_t and SUE_t *X [=1, if* Rel_pct_{t-1} *=0]*. If the holdings of relationship institutions mitigate the impact of earnings surprises, we should observe that firms without relationship holdings prior to earnings announcements are likely to experience a larger price impact due to earnings surprises, i.e., the estimate on SUE_t *X [=1, if* Rel_pct_{t-1} *=0]* should be positive, which implies the slope on SUE is larger. Note that we are using within firm variation for this analysis because for this subsample all firms have relationship holdings at some point. The significantly positive coefficients on both variables confirm that relationship holdings alleviate the impacts of earnings surprises.

We also examine 21-day abnormal trading volume (*Volume[-10,10*]) estimated from the market model surrounding each earnings announcement as described in Campbell and Wasley (1996). Column (3) of Table 8 reports the regression results. We do not find evidence that relationship holdings have an impact on abnormal trading volume within this window.

Finally, the last Column of Table 8 examines the effect of relationship holdings on firms' residual risk. Although the estimated coefficients on both SUE_t and SUE_t *X [=1, if* Rel_pct_{t-1} *=0]* are not significantly different from zero, the sum of the two is significant. This suggests that relationship holdings play a role in reducing the impact of earnings surprises on residual risk. Regardless of institutional type, trading and level of holdings are significantly positively related to residual risk. Overall, the evidence provided in this section suggests that relationship

institutions provide a price support function to their clients that suffer from negative earnings shocks by trading against independent institutions. Such support appears to significantly reduce the impact of earnings surprises.

[Insert Table 8 here]

4.3 Price Support Measures and Long-Term Stock Price Performance

To assess long-term stock price performance, we use a traditional portfolio approach. In light of the serial correlations of earnings surprises and institutional trading documented in the previous section, we take a longer term view by constructing a price support measure using four quarters of information. We re-examine the effects of institutional behavior by more precisely contrasting the degree of price support within the set of connected firms. The crux of our hypotheses center on institutions' behavior when there is bad news, thus we focus on negative earnings surprises in the following discussion.

Recall from Table 1, connected firms have a median of 3 (119) relationship (independent) institutions holding their shares (a ratio of about 40:1). And relationship institutions (independent institutions) hold a median of 1.1% (58.9%) of connected firms' shares outstanding (a ratio of about 54:1). But from Table 3 the cumulative selling (buying) of connected firms by independent (relationship) firms over the three quarters up through a negative earnings surprise is 0.718% (0.113%) of shares outstanding (a ratio of 6.4:1). Thus, although relationship institutions are greatly outnumbered and outweighed in terms of holdings by independent institutions, their trading intensity before negative earnings surprises is proportionately much greater than their holdings level. To focus more closely on the intensity of trading by individual institutions, we standardize each quarter's trading activity by constructing a price support (PS) measure similar

to Shu's (2007) positive-feedback measure (MT measure). Specifically, we use the following procedures to calculate the PS measure. First, we calculate $\Delta hold_{i,t}$ (changes in holdings) for firm *i* in quarter *t* and divide it by $\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|$, the sum of the absolute value of changes in institutional holdings of firm *i* over the four quarters leading up to the announcement (quarter *t*). Second, we calculate a $SUEindex_{i,t}$, a discrete index that measures the sign and magnitude of SUE for firm *i* in quarter *t*. To do this, each quarter firms are sorted into quartiles by SUE and assigned a $SUEindex_{i,t}$ with values: -2, -1, 1 or 2. Finally, each quarter, we multiply $\frac{\Delta hold_{it}}{\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|}$ by $SUEindex_{i,t}$ and sum the product across the past four quarters to obtain the price support measure (PS). We refer to the four quarters leading up to the current earnings announcement as the *PS construction period*. Note that when $SUEindex_{i,t}$ is positive, a higher PS measure indicates greater buying. However, when $SUEindex_{i,t}$ is negative, a smaller (more negative) PS indicates greater buying, i.e., a contrarian strategy.

Panel A of Table 9 reports PS measures for connected firms, sorted into quintiles by their past four quarter's average SUE. For the most positive average earnings surprises (quintile 5) connected firms receive positive price support by both relationship and independent institutions. However, price support by relationship institutions is significantly higher than for independent institutions (difference in PS = 0.288, t-value = 4.59). For the most negative earnings surprises (quintile 1) connected firms also have positive price support by both relationship and independent institutions (a negative *SUEindex* multiplied by a positive scaled change in holdings). Again, PS is significantly higher for relationship institutions, supporting the relationship insurance hypothesis (difference in PS = -0.102, t-value = -2.21). For completeness,

Panel B examines the behavior of independent institutions with respect to their PS measures for connected and unconnected firms. PS by independent institutions is positive for both connected and unconnected firms when earnings surprises are the most positive (quintile 5). However, for the most negative earnings surprises (quintile 1), PS by independent institutions is positive for connected firms and negative for unconnected firms (difference in PS = -0.139, t-value = -3.41, remembering the *SUEindex* is negative in this case). These findings are consistent with a momentum strategy by independent institutions for unconnected firms regardless of the sign of earnings surprises: (buying (selling) when average earnings surprise is positive (negative)). However, independent institutions pursue such a strategy for connected firms only when earnings surprises are positive. Like our results using raw changes in holdings reported in Table 3, our scaled price support measure also shows significant differences in institutional trading in support of the relationship insurance hypothesis. Price support by relationship institutions appears to reduce the likelihood that independent institutions sell connected firms with negative average SUE.

[Insert Table 9 here]

4.4 Hedge Portfolio Returns

As an additional test of the potential differential effects of trading by relationship versus independent institutions, we examine monthly hedge portfolio (buy-minus-sell) returns conditional on the sign of average SUE during the four quarter PS construction period. We also calculate hedge portfolio returns for two years following the PS construction period. Specifically, we estimate monthly alphas for all sample firms using the Fama-French-Carhart four-factor model. Each quarter we do separate sorts of connected and unconnected firms that have had a

negative average SUE over the PS construction period into quintiles based on their PS measures. The hedge portfolio buys firms with the most price support (quintile 5) and sells firms with the least price support (quintile 1). We follow the same procedure for firms with a positive average SUE over the PS construction period.

Table 10 shows sharp differences in hedge portfolio return patterns. Hedge portfolios formed based on PS by relationship institutions earn largely insignificant returns during the PS construction period (though significantly negative for months [-3, -1] for negative average SUE, and [-6, -4] and [-3, -1] for positive average SUE); and largely negative significant returns over the following two years. By contrast, portfolios formed based on price support by independent institutions for both connected and unconnected firms earn positive and significant returns over the PS construction period for both positive and negative average SUE. Returns over the following two years are largely insignificant for firms with positive average SUE, but are significantly negative for 15 months for connected firms and nine months for unconnected firms when average SUE is negative. The evidence further supports that in contrast with relationship institutions, independent institutions' trading is consistent with a momentum strategy.

In a final analysis we focus specifically on the abnormal stock price reactions of connected firms that have experienced negative average SUE's over the PS construction period. We examine four groups of firms: 1) Firms with the most price support by relationship institutions (Rel (buy)); 2) Firms with the least price support by relationship institutions (Rel (sell)); 3) Firms with the most price support by independent institutions (Ind (buy)); 4) Firms with the least price support by independent institutions (Ind (sell)). For comparison, abnormal returns on Rel (buy) firms minus those on Rel (sell) firms are the hedge portfolio returns in column 2 in Table 10, while abnormal returns on Ind (buy) firms minus those on Ind (sell) firms

are the hedge portfolio returns in column 3 in Table 10. Figure 1 traces simulated price levels for these four groups of firms. We assume all portfolios start with a hypothetical index price of 100. Subsequent simulated prices are obtained by sequentially multiplying by $(1 + \alpha)$, where α is from the Fama-French-Carhart four-factor model. For brevity, we do not discuss significance when interpreting price paths in Figure 1, as significance has already been demonstrated in Table 10.

First consider results based on the buying or selling by independent institutions. Figure 1 shows that extreme selling by independent institutions is associated with a large decline in the simulated price during the PS construction period. The simulated price level of this portfolio (Ind (Sell)) drops more than 13 points to below 87 over this period. In fact, the significant positive hedge portfolio returns over this period for independent institutions (column 3, Table 10) are driven largely by the dramatic price decline of the extreme sell portfolio. Interestingly, abnormal returns for this portfolio reverse in the post-earnings announcement period. In fact, two years after the earnings announcement, the portfolio's simulated price recovers to slightly above 100. By contrast, extreme buying by independent institutions is associated with modest positive abnormal returns. The simulated price of this portfolio (Ind (Buy)) rises to about 104 during the PS construction period, but exhibits no significant trend afterward. These results suggest that when firms experience negative SUEs, if independent institutions decide to sell, the resulting selling pressure pushes stock prices below firms' fundamental values for rather extensive periods. If the selling was driven by fundamental information, we should not expect to observe a reversal in simulated prices, and hedge portfolio returns should be insignificantly different from zero following the PS construction period.

Figure 1 shows that for portfolios formed based on the behavior of relationship institutions, the simulated price levels of both extreme buy (Rel (Buy)) and extreme sell (Rel (Sell)) portfolios both decrease to about 95 over the PS construction period. Both portfolios begin to recover in the month before earnings are announced. The Rel (Buy) portfolio recovers most of its value two years after the announcement. Perhaps surprisingly, the Rel (Sell) portfolio rebounds strongly after the PS construction period, performing the best among all four portfolios. Though surprising, these results can be considered to be consistent with the relationship insurance hypothesis. Using their relationship information about client firms and with limited capital to support client firms' stock prices, banks may choose to sell those clients they feel are the strongest and buy those they feel are most in need of price support. This is in stark contrast to the hypothesis that relationship institutions use their private information to earn trading profits. Finally, if trading by relationship and independent institutions had no effect on prices, we should expect insignificant random drift for all portfolios during both the PS construction period and the following two year period.

A final observation implied by Figure 1 is that relationship and independent institutions do not buy and sell the same groups of firms. If this were true, we would expect similar price paths for firms either bought or sold by both relationship and independent institutions. The fact that the group of firms supported by relationship institutions (Rel (Buy)) exhibits a much smoother price path relative to those sold by independent institutions (Ind (Sell)) is consistent with the relationship insurance hypothesis. The extent of the impact of support by relationship institutions seems remarkable when one considers that relationship institutions are greatly outnumbered and outweighed in terms of holdings. Also, if one considers abnormal returns and

reversals surrounding earnings announcements to represent an anomaly or market inefficiency, then price support by relationship institutions helps to mitigate this inefficiency.

[Insert Table 10 and Figure 1 here]

5. Conclusion

Financial conglomerates have the opportunity to gather information from multiple sources, and to use that information in multiple ways. When asset managers hold shares of firms that also have lending or underwriting relationships with affiliated banks, they may either exploit private information obtained from their affiliated banks to make profits (information exploitation hypothesis), or support their clients to maintain good relationships in hope of future business opportunities (relationship insurance hypothesis). Although "Chinese Walls" are designed to prevent information spillover among different divisions of financial conglomerates, prior studies suggest that Chinese Walls may not be totally effective. This paper examines the trading behavior of relationship institutions and the resulting impact on connected client firms, focusing primarily upon when these client firms experience negative earnings shocks.

Our empirical findings support the relationship insurance hypothesis since relationship institutions support their client firms when these firms have negative earnings surprises. This support (increase in share holdings) also appears to discourage selling pressure from independent institutions holding shares in these client firms. Moreover, price support from relationship institutions mitigates both the negative announcement period returns and the post-earnings-announcement-drift of client firms, thus generating smoother price paths for these firms.

We believe this paper contributes to the literature on the roles of institutional investors and, more generally, financial institutions by studying the non-intermediary role of financial

conglomerates in the capital markets. The findings also provide implications for the asset pricing literature. If relationships among institutions can reduce unnecessary temporary price movements, less noise in financial markets could be considered welfare enhancing. An interesting area for future study would be to further explore relationships among firms, including specific motivations for buying and selling by relationship and independent institutions.

Appendix: Variable Definitions

It is important to note that holdings data and some firm characteristics, such as book to market, are available at the end of each quarter. However, earnings announcements occur randomly within a quarter. As a convention, we label both holdings and the most recent earnings announcement using the same time indicator t. Therefore, the holdings and some firm characteristics can be up to two months later than the most recent earnings announcement.

Age_{it-1}: the number of years since firm *i* was added into the CRSP database, calculated at the end of each quarter prior to earnings announcement at time *t*.

$Aveindpct_{it-1}$: the percentage of firm *i* held by each independent institution on average, calculated at the end of each quarter prior to earnings announcement at time *t*.

$Avepct_{it-1}$: the percentage of firm *i* held by each institution on average, calculated at the end of each quarter prior to earnings announcement at time *t*.

$Averelapct_{it-1}$: the percentage of firm *i* held by each relationship institution on average, calculated at the end of each quarter prior to earnings announcement at time *t*.

B/M_{it-1}: book value divided by market value for firm *i*, calculated at the end of each quarter prior to earnings announcement at time *t*.

$Beta_{it}$: the CAPM beta of firm *i* estimated from a market model surrounding earnings announcement at time *t*.

$CAR[-1, 1]_{it}$: the 3-day cumulative abnormal return (estimated from market model) for firm *i* surrounding earnings announcement at time *t*.

Connected firm: a firm which has relationship institutions (see relationship institutions).

Cum_return_{it-1}: three-month cumulative return for firm *i*, calculated at the end of each quarter prior to earnings announcement at time *t*.

Dum_rela_{it}: equal to 1 if firm *i* is connected (has one or more relationship institutions) and 0 otherwise at time *t*.

Err_{it}: actual earnings per share for firm *i* minus the consensus of analysts' forecasts measured on the day of earnings announcement, deflated by stock price at the end of the quarter prior to the earnings announcement at time *t*.

Ind_num$_{it-1}$: the number of independent institutions for firm *i*, calculated at the end of each quarter prior to earnings announcement at time *t*.

Ind_pct$_{it-1}$: the aggregate percentage of firm *i* held by all independent institutions, calculated at the end of each quarter prior to earnings announcement at time *t*.

Ind_PS: price support measure of independent institution, which is calculated using holding changes from independent institution with similar procedures as in Rel_PS measure (see Rel_PS).

Independent institution: an institutional investor which holds a company's shares without a lending or underwriting relationship with this company within a three-year period prior to the company's earnings announcement at time *t*.

Numest$_{it}$: the number of analysts following firm *i* right before earnings announcement at time *t*.

Pct$_{it-1}$: the aggregate percentage of firm *i* held by all institutions, calculated at the end of each quarter prior to earnings announcement at time *t*.

Re_num$_{it-1}$: the number of relationship institutions for firm *i*, calculated at the end of each quarter prior to earnings announcement at time *t*.

Rel_PS: price support measure for relationship institution, which is similar to Shu's (2007) positive-feedback measure (MT measure) and calculated by the following procedures. First, we calculate $\Delta hold_{i,t}$ (changes in holdings from relationship institutions) for firm *i* in quarter *t* and divide it by $\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|$, the sum of the absolute value of changes in relationship institutional holdings of firm *i* over the four quarters leading up to the announcement (quarter *t*). Second, we calculate a $SUEindex_{i,t}$, a discrete index that measures the sign and magnitude of SUE for firm *i* in quarter *t*. To do this, in each quarter firms are sorted into quartiles by SUE and assigned a $SUEindex_{i,t}$ with values: -2, -1, 1 or 2. Finally, each quarter, we multiply $\frac{\Delta hold_{it}}{\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|}$ by $SUEindex_{i,t}$ and sum the product across the past four quarters to obtain the price support measure.

Rela_pct$_{it-1}$: the aggregate percentage of firm *i* held by all relationship institutions, calculated at the end of each quarter prior to earnings announcement at time *t*.

Relationship institution: an institutional investor which has a lending or underwriting relationship with a client firm and also holds the client's equity within a three-year period prior to its client firm's earnings announcement at time *t*.

$Residual_{it}$: idiosyncratic risk estimated from a market model surrounding earnings announcement at time *t*.

$Size_{it-1}$: market capitalization of firm *i* (converting to log value in the regression), calculated at the end of each quarter prior to earnings announcement at time *t*.

$Stdev_{it}$: cross-sectional standard deviation of analysts' earnings forecasts for firm *i* right before announcement at time *t*.

SUE_{it}: each quarter's standardized unexpected earnings for firm *i* at time *t* as defined by Chordia and Shivakumar (2006) as follows:

$$SUEi = \frac{\text{Quarterly earnings - Expected quarterly earnings}}{\text{Standard deviation of earnings changes in the prior eight quarters}}$$

where expected quarterly earnings are earnings four quarters prior to current quarter.

Unconnected firm: a firm which does not have any relationship institutions.

$Volume[-10, 10]_{it}$: 21-day abnormal trading volume (estimated from market model) surrounding earnings announcement at time *t*, estimated as described in Campbell and Wasley (1996).

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Table 1 Summary Statistics

This table reports median statistics for summary statistics. Each quarter, sample firms are defined as connected or unconnected based on whether their shares are held by their relationship institutions. Relationship institutions are those whose affiliated banks have had either a lending or underwriting relationship with client firms over the previous three years. *SUE* is defined in equation (2) of section 3.2. The following firm characteristics are calculated at the end of each quarter prior to the earnings announcement. See Appendix for variable definitions. All differences in medians are significant at the 1% level except Cum_return is not significant.

	Connected	Unconnected	Difference
SUE	0.463	0.412	0.051
Size	1144.267	301.795	842.473
B/M	0.472	0.530	-0.058
Age	16	13	3
Err	0.013	0.000	0.013
Numest	7	3	4
Stdev	0.010	0.010	0.000
Cum_return	2.94%	2.98%	-0.04%
CAR[-1,1]	0.21%	0.10%	0.11%
Beta	1.16	1.02	0.14
Volume[-10, 10]	50%	67%	-17%
Residual	0.022	0.023	-0.001
Pct	61.37%	44.90%	16.46%
Rela_pct	1.10%	0.00%	1.10%
Ind_pct	58.89%	44.90%	13.98%
Avepct	0.48%	0.80%	-0.31%
Averelacpt	0.32%	0.00%	0.32%
Aveindpct	0.48%	0.80%	-0.31%
Re_num	3	0	3
Ind_num	119	53	66
Number of obs.	57729	49428	

Table 2 Correlation Matrix

This table reports correlation coefficients and p-value. All variables are defined in Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Dum_rela	1.00															
(2) SUE	0.02 <.01	1.00														
(3) Size	0.38 <.01	0.26 <.01	1.00													
(4) B/M	-0.06 <.01	-0.25 <.01	-0.36 <.01	1.00												
(5) Age	0.17 <.01	0.01 0.00	0.47 <.01	-0.03 <.01	1.00											
(6) Err	0.01 0.05	0.04 <.01	0.03 <.01	-0.08 <.01	0.01 0.04	1.00										
(7) Numest	0.30 <.01	0.18 <.01	0.72 <.01	-0.21 <.01	0.23 <.01	0.02 <.01	1.00									
(8) Stdev	0.01 0.01	-0.10 <.01	-0.05 <.01	0.12 <.01	0.01 <.01	-0.04 <.01	-0.03 <.01	1.00								
(9) Cum _return	-0.01 0.03	0.12 <.01	0.08 <.01	-0.19 <.01	-0.02 <.01	0.02 <.01	0.00 0.17	-0.04 <.01	1.00							
(10) CAR [-1,1]	0.00 0.27	0.07 <.01	-0.02 <.01	0.03 <.01	0.00 0.47	0.02 <.01	0.00 0.41	-0.02 <.01	0.00 0.47	1.00						
(11) Beta	0.05 <.01	0.00 0.19	0.04 <.01	-0.05 <.01	-0.09 <.01	-0.01 0.05	0.09 <.01	0.02 <.01	0.03 <.01	0.00 0.87	1.00					
(12) Residual	-0.03 <.01	-0.13 <.01	-0.39 <.01	0.19 <.01	-0.31 <.01	-0.06 <.01	-0.15 <.01	0.08 <.01	-0.08 <.01	-0.02 <.01	0.20 <.01	1.00				
(13) Volume [-10,10]	-0.01 0.00	0.04 <.01	-0.01 0.00	-0.02 <.01	-0.02 <.01	0.00 0.43	0.00 0.35	-0.01 <.01	0.02 <.01	0.02 <.01	0.03 <.01	0.15 <.01	1.00			
(14) Pct	0.30 <.01	0.13 <.01	0.40 <.01	-0.14 <.01	0.13 <.01	0.02 <.01	0.36 <.01	-0.03 <.01	0.02 <.01	0.01 0.04	0.09 <.01	-0.14 <.01	0.02 <.01	1.00		
(15) Rela_pct	0.40 <.01	0.02 <.01	0.29 <.01	-0.03 <.01	0.14 <.01	0.01 0.10	0.24 <.01	0.01 0.08	-0.02 <.01	0.00 0.80	0.00 0.79	-0.03 <.01	0.00 0.62	0.31 <.01	1.00	
(16) Ind_pct	0.26 <.01	0.13 <.01	0.38 <.01	-0.14 <.01	0.12 <.01	0.02 <.01	0.34 <.01	-0.04 <.01	0.03 <.01	0.01 0.04	0.09 <.01	-0.14 <.01	0.02 <.01	0.99 <.01	0.19 <.01	1.00
(17) Re_num	0.56 <.01	0.03 <.01	0.52 <.01	-0.06 <.01	0.30 <.01	0.01 0.03	0.42 <.01	0.02 <.01	-0.02 <.01	0.00 0.77	0.00 0.72	-0.09 <.01	-0.01 0.03	0.31 <.01	0.61 <.01	0.24 <.01

Table 3 Institutional Trading and Earnings Surprises

This table reports quarterly changes in holdings (in %) surrounding earnings announcements. Earnings are announced in quarter [0, 1]. Firms with relationship institutions holding their shares are classified as connected firms, otherwise, they are unconnected, i.e., they only have independent institutional owners. Relationship institutions (REL) are banks that invest in firms' equities and have had lending or underwriting relationships with these firms within three years prior to the most recent earnings announcement. Institutions that only hold equities and do not have lending or underwriting relationships with invested firms are independent institutions (IND). Finally, all firms are further sorted into quintiles according to their most recent SUE. Panel A reports the highest and lowest quintiles, and Panel B reports the middle three quintiles. The last three rows in each panel show the average percent of firms' shares held by either REL or IND, the average number of institutions at the end of quarter 1 and the number of observations. Quarterly intervals relative to the current earnings announcement are denoted in brackets. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

	SUE 1 (Lowest)						SUE 5 (Highest)					
	Connected				Unconnected		Connected				Unconnected	
QTR	REL		IND		IND		REL		IND		IND	
Panel A: SUE quintiles 1 and 5												
[-3, -2]	0.039	**	-0.349	***	-0.436	***	0.133	***	0.563	***	0.590	***
[-2, -1]	0.046	***	-0.192	**	-0.629	***	0.138	***	0.683	***	0.553	***
[-1, 0]	0.028	**	-0.177	**	-0.693	***	0.153	***	0.500	***	0.428	***
[0, 1]	0.046	***	0.205	***	-0.733	***	0.155	***	0.568	***	-0.247	**
[1, 2]	0.001		0.174	**	0.541	***	0.046	***	-0.490	***	0.739	***
[2, 3]	0.013		0.443	***	0.430	***	0.050	***	-0.149		0.225	**
[3, 4]	0.025		0.447	***	0.473	***	0.052	***	-0.145		0.185	*
[4, 5]	0.024		0.487	***	0.489	***	0.040	**	-0.216	**	0.195	**
Holdings	2.22		53.67		41.74		2.41		61.10		48.68	
# Inst.	4		144		71		5		233		134	
# Obs	10876		10876		8449		11037		11037		8288	

Table 3 (Continued)

	SUE 2						SUE 3						SUE 4					
	Connected				Unconnected		Connected				Unconnected		Connected				Unconnected	
QTR	REL		IND		IND		REL		IND		IND		REL		IND		IND	
Panel B: SUE Quintiles 2 to 4																		
[-3, -2]	0.060	***	0.099		-0.040		0.075	***	0.483	***	0.520	***	0.087	***	0.775	***	0.565	***
[-2, -1]	0.086	***	0.183	**	-0.034		0.090	***	0.751	***	0.528	***	0.115	***	0.859	***	0.742	***
[-1, 0]	0.092	***	0.406	***	-0.116		0.080	***	0.690	***	0.453	***	0.125	***	0.966	***	0.626	***
[0, 1]	0.102	***	0.642	***	-0.224	**	0.112	***	0.846	***	0.186	*	0.116	***	1.168	***	0.102	
[1, 2]	0.023		0.096		0.507	***	-0.002		0.102		0.785	***	0.020		-0.011		0.898	***
[2, 3]	0.025		0.385	***	0.513	***	0.042	***	0.299	***	0.356	***	0.040	***	0.191	**	0.405	***
[3, 4]	0.013		0.652	***	0.457	***	0.068	***	0.373	***	0.317	***	0.041	***	0.072		0.151	
[4, 5]	0.027		0.391	***	0.318	***	0.036	**	0.405	***	0.336	***	0.056	***	0.241	**	0.278	**
Holdings	2.13		53.48		41.87		2.18		55.87		44.19		2.23		57.44		45.23	
# Inst.	4		149		73		4		161		79		4		174		89	
# Obs	10317		10317		9008		10358		10358		8967		10834		10834		8491	

Table 4 Regressions for Abnormal Returns Surrounding Earnings Announcements

This table reports whether the 3-day cumulative abnormal returns, CAR (-1, +1), are different between connected firm and unconnected firms using fixed effect model. The dependent variable, CAR (-1, +1), is estimated from the market model. All estimated coefficients are scaled by a factor of 100. Panels A, B, and C report the results estimated with all earnings announcements, positive earnings surprises, and negative earnings surprises, as defined by SUE, respectively. Unit of observations is firm-quarter. Independent variables are defined in Appendix. T-values are reported in brackets. Standard errors are clustered within a firm. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

Panel A: All announcements				
	(1)	(2)	(3)	(4)
VARIABLES	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$
Dum_rela_{t-1}	0.335***	0.390***	0.332***	
	[4.36]	[4.97]	[4.04]	
Re_num_{t-1}				0.0525***
				[4.60]
$Size_{t-1}$	-1.37***	-1.40***	-1.40***	-1.42***
	[-14.16]	[-14.63]	[-13.66]	[-13.67]
B/M_{t-1}	0.490**	0.199	0.218	0.194
	[2.29]	[1.08]	[1.02]	[0.90]
SUE_t	0.462***	0.400***	0.391***	0.395***
	[21.79]	[19.08]	[18.14]	[18.35]
Age_{t-1}	1.53***	1.61***	1.71***	1.65***
	[9.14]	[9.18]	[8.91]	[8.56]
$Numest_{t-1}$		0.00292	-0.00183	-0.00369
		[0.25]	[-0.15]	[-0.31]
$Stdev_{t-1}$		0.139	0.799*	0.797*
		[0.34]	[1.68]	[1.67]
Err_{t-1}			0.670**	0.672**
			[2.44]	[2.44]
Cum_return_{t-1}			-0.255	-0.251
			[-1.59]	[-1.56]
Constant	23.3***	24.2***	23.9***	24.7***
	[13.05]	[13.96]	[12.91]	[12.89]
Observations	103,887	90,594	83,466	83,466
Number of firms	5,261	4,821	4,552	4,552
R^2 (within)	0.02	0.01	0.01	0.01

Table 4 (Continued)

Panel B: Positive earnings surprises				
	(1)	(2)	(3)	(4)
VARIABLES	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$
Dum_rela_{t-1}	0.323***	0.323***	0.247***	
	[3.60]	[3.50]	[2.60]	
Re_num_{t-1}				0.0477***
				[3.73]
$Size_{t-1}$	-1.47***	-1.44***	-1.38***	-1.41***
	[-15.19]	[-12.84]	[-11.71]	[-11.76]
B/M_{t-1}	1.29***	1.31***	1.30***	1.26***
	[5.76]	[5.01]	[4.53]	[4.36]
SUE_t	0.303***	0.271***	0.261***	0.265***
	[12.74]	[11.40]	[10.74]	[10.90]
Age_{t-1}	1.81***	1.85***	1.91***	1.85***
	[9.81]	[9.02]	[8.70]	[8.40]
$Numest_{t-1}$		0.00740	-0.00346	-0.00498
		[0.56]	[-0.25]	[-0.36]
$Stdev_{t-1}$		0.0347	0.708	0.703
		[0.06]	[1.00]	[1.00]
Err_{t-1}			0.154	0.155
			[1.43]	[1.44]
Cum_return_{t-1}			-0.584***	-0.577***
			[-2.92]	[-2.89]
Constant	24.8***	24.2***	23.0***	24.0***
	[14.04]	[11.95]	[10.81]	[10.83]
Observations	68,792	60,881	56,346	56,346
Number of firms	4,977	4,526	4,244	4,244
R^2 (within)	0.02	0.02	0.02	0.02

Table 4 (Continued)

Panel C: Negative earnings surprises				
	(1)	(2)	(3)	(4)
VARIABLES	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$	$CAR[-1,1]_t$
Dum_rela_{t-1}	0.479***	0.624***	0.559***	
	[3.19]	[3.96]	[3.28]	
Re_num_{t-1}				0.0594**
				[2.56]
$Size_{t-1}$	-0.963***	-1.12***	-1.23***	-1.23***
	[-5.13]	[-6.35]	[-6.67]	[-6.55]
B/M_{t-1}	0.629*	0.168	0.151	0.148
	[1.95]	[0.67]	[0.52]	[0.50]
SUE_t	0.583***	0.560***	0.506***	0.506***
	[7.94]	[7.26]	[6.18]	[6.20]
Age_{t-1}	0.790**	0.892***	1.19***	1.17***
	[2.58]	[2.76]	[3.48]	[3.40]
$Numest_{t-1}$		-0.00300	0.00152	-0.000058
		[-0.13]	[0.07]	[-0.00]
$Stdev_{t-1}$		1.27*	1.54**	1.52**
		[1.69]	[2.27]	[2.25]
Err_{t-1}			1.44***	1.44***
			[3.66]	[3.65]
Cum_return_{t-1}			-0.281	-0.284
			[-0.98]	[-0.99]
Constant	16.3***	19.6***	21.2***	21.4***
	[4.72]	[6.20]	[6.33]	[6.20]
Observations	35,095	29,713	27,120	27,120
Number of firms	4,548	4,089	3,832	3,832
R^2 (within)	0.01	0.01	0.01	0.01

Table 5 Earnings Momentum

This table reports average monthly raw returns for earnings momentum portfolios for holding periods of one, three, and six months following earnings announcements. Sample firms are divided into connected and unconnected firms each month, based on whether they are held by their relationship institutions. Then, all firms are sorted independently into quintiles based on their most recent SUE. Portfolio SUE1 contains firms with the lowest SUE and SUE5 contains the highest SUE firms. Time-series average monthly returns are then calculated for each holding period portfolio. SUE5-SUE1 measures post-announcement earnings momentum. DIFF is the difference in earnings momentum between connected and unconnected firms. The numbers in brackets are *t*-values. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

	SUE1	SUE2	SUE3	SUE4	SUE5	SUE5-SUE1	DIFF
Panel A: one month							
Connected	1.18%	1.11%	1.57%	1.79%	1.59%	0.41%	-1.14%
	[2.46]***	[2.81]***	[4.03]***	[4.66]***	[4.28]***	[1.39]	[-5.37]***
Unconnected	0.72%	1.34%	1.83%	2.17%	2.27%	1.55%	
	[1.62]	[3.05]***	[4.72]***	[5.83]***	[6.71]***	[5.91]***	
Panel B: three months							
Connected	1.63%	1.20%	1.54%	1.66%	1.43%	-0.19%	-1.13%
	[3.19]***	[2.99]***	[4.00]***	[4.15]***	[3.87]***	[-0.61]	[-4.46]***
Unconnected	1.04%	1.47%	1.83%	1.96%	1.97%	0.93%	
	[2.31]**	[3.44]***	[4.79]***	[5.31]***	[5.89]***	[3.49]***	
Panel C: six months							
Connected	1.76%	1.32%	1.54%	1.55%	1.34%	-0.42%	-1.00%
	[3.42]***	[3.34]***	[4.00]***	[3.78]***	[3.62]***	[-1.28]	[-3.79]***
Unconnected	1.20%	1.56%	1.83%	1.81%	1.79%	0.59%	
	[2.67]***	[3.70]***	[4.72]***	[4.98]***	[5.28]***	[2.15]**	

Table 6 Determinants of Ownership Level by Type of Institutions

This table reports the preference of institutional ownership by type using Arellano–Bover/Blundell–Bond linear dynamic panel-data estimation (columns 1 and 2) and fixed effects (columns 3 and 4). The dependent variables are the proportion of holding by relationship institutions for regressions (1) and (3) and that by independent institutions for regressions (2) and (4). All estimated coefficients are scaled by a factor of 100. The sample consists of firms that have ever had relationship institutions. Unit of observations is firm-quarter. Change in holdings, three-day CAR surrounding prior earning announcements and their interaction terms with negative SUE indicator are treated as endogenous variables in the linear dynamic panel-data estimation but considered as exogenous in the fixed effects models. Robust standard errors using the dynamic panel and clustered standard errors within firms used in the fixed effects model are used to calculate z-values reported in brackets. Both firms fixed effects and quarterly fixed effects are included in the fixed effects model. The null hypothesis of no serial correlation at order two in the first-differenced errors for the dynamic panel is tested and reported at the bottom with the label "autocorrelation (Z-test)." See Appendix for variable definitions and associated data time frame. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

	Dynamic Panel		Fixed Effects	
	(1)	(2)	(3)	(4)
VARIABLES	Rel_pct_t	Ind_pct_t	Rel_pct_t	Ind_pct_t
NEG_t=1 if negative SUE_t	0.06*	-0.15	-0.01	-0.43***
	[1.83]	[-1.20]	[-0.67]	[-5.81]
Rel_pct_{t-1}	72.83***		70.00***	
	[16.16]		[24.86]	
Rel_pct_{t-2}	6.70***		6.82*	
	[2.90]		[1.81]	
$Change\_Ind\_pct_t$	5.35**		0.12	
	[2.47]		[0.30]	
$Change\_Ind\_pct_{t-1}$	-0.38		-0.63***	
	[-1.14]		[-3.43]	
$Change\_Ind\_pct_t$ X NEG_t	-10.30**		-1.18*	
	[-2.41]		[-1.84]	
$Change\_Ind\_pct_{t-1}$ X NEG_{t-1}	-2.94*		-0.33	
	[-1.68]		[-0.98]	
Ind_pct_{t-3}	0.48***		-0.28**	
	[2.96]		[-2.44]	
Ind_pct_{t-1}		45.57***		53.89***
		[8.62]		[23.46]
Ind_pct_{t-2}		11.53***		18.67***
		[4.69]		[22.41]
$Change\_Rel\_pct_t$		210.91***		5.48
		[3.54]		[0.44]
$Change\_Rel\_pct_{t-1}$		-14.90		-24.25***
		[-0.79]		[-6.10]
$Change\_Rel\_pct_t$ X NEG_t		-236.54***		-27.21*
		[-3.33]		[-1.88]

Change_Rel_pct$_{t-1}$ X NEG$_{t-1}$		-95.05**		2.68
		[-2.39]		[0.43]
Rel_pct$_{t-3}$		16.02**		-19.07***
		[2.30]		[-7.66]
CAR[-1,1]$_t$	1.16	23.97***	0.24**	9.06***
	[0.93]	[4.92]	[2.24]	[12.56]
CAR[-1,1]$_{t-1}$	0.63	10.53**	0.22*	0.23
	[0.58]	[2.32]	[1.72]	[0.29]
CAR[-1,1]$_t$ X NEG$_t$	-1.85	-7.16	-0.02	-1.35
	[-0.47]	[-0.69]	[-0.13]	[-1.21]
CAR[-1,1]$_{t-1}$ X NEG$_{t-1}$	-0.75	1.13	0.04	0.17
	[-0.40]	[0.15]	[0.18]	[0.18]
Size$_{t-1}$	0.21***	1.50***	0.06**	0.02
	[2.84]	[3.04]	[2.15]	[0.17]
B/M$_{t-1}$	-0.07	0.12	-0.12***	-1.66***
	[-0.77]	[0.27]	[-3.11]	[-8.21]
Age$_{t-1}$	0.01	-0.04	0.05***	0.34***
	[1.27]	[-1.00]	[4.98]	[4.34]
Err$_t$	0.14	-0.12	0.07	0.69
	[0.92]	[-0.19]	[1.10]	[1.16]
Numest$_t$	0.01*	0.10***	0.00	-0.04***
	[1.83]	[2.92]	[1.39]	[-2.62]
Stdev$_t$	-0.33	-0.26	-0.22	-1.61**
	[-1.34]	[-0.28]	[-1.15]	[-2.24]
Cum_return$_{t-1}$	-0.10	0.88**	-0.01	3.45***
	[-1.14]	[2.51]	[-0.35]	[10.72]
Beta$_t$	-0.01	0.04	-0.00	0.10***
	[-1.09]	[0.88]	[-0.16]	[3.59]
Residual$_t$	0.21	-57.99***	-1.11*	-45.20***
	[0.17]	[-7.62]	[-1.69]	[-11.03]
Volume[-10,10]$_t$	-0.00	0.02***	-0.00	0.03***
	[-0.67]	[4.37]	[-0.18]	[8.11]
Constant	-4.53***	-5.25	-1.69***	10.84***
	[-2.99]	[-0.77]	[-2.82]	[3.31]
Observations	50,218	50,218	50,218	50,218
Number of firms	2,693	2,693	2,693	2,693
Wald Chi^2	2202	1683		
Autocorrelation (Z-test)	-0.636	-0.192		
R^2 (within)			0.65	0.61
Null: the sum of coefficients on *Change_Ind(Rel)_pct$_t$ and Change_Ind(Rel)_pct$_t$ X NEG$_t$* is 0.				
Wald test	3.73	1.07		
Prob>Chi^2	0.05	0.30		

Table 7 Determinants of Trading by Type of Institutions

This table reports the institutional trading by type using Arellano–Bover/Blundell–Bond linear dynamic panel-data estimation (columns 1 and 2) and fixed effects (columns 3 and 4). The dependent variables are the change of proportion of holding by relationship institutions for regressions (1) and (3) and that by independent institutions for regressions (2) and (4). All estimated coefficients are scaled by a factor of 100. The sample consists of firms that have ever had relationship institutions. Unit of observations is firm-quarter. Change in holdings, three-day CAR surrounding concurrent earning announcements (*t*) and their interaction terms with negative SUE indicator are treated as endogenous variables in the linear dynamic panel-data estimation but considered as exogenous in the fixed effects models. Robust standard errors using the dynamic panel and clustered standard errors within firms used in the fixed effects model are used to calculate z-values reported in brackets. Both firms fixed effects and quarterly fixed effects are included in the fixed effects model. The null hypothesis of no serial correlation at order two in the first-differenced errors for the dynamic panel is tested and reported at the bottom with the label "autocorrelation (Z-test)." See Appendix for variable definitions and associated data time frame. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

	Dynamic Panel		Fixed Effects	
	(1)	(2)	(3)	(4)
Dependent Variables:	$Ch\_Rel\_pct_t$	$Ch\_Ind\_pct_t$	$Ch\_Rel\_pct_t$	$Ch\_Ind\_pct_t$
NEG_t=1 if negative SUE_t	0.04*	-0.54***	0.01	-0.30***
	[1.71]	[-4.42]	[0.66]	[-3.45]
$Change\_Rel\_pct_t$		123.95***		8.49
		[2.75]		[0.54]
$Change\_Rel\_pct_{t-1}$	-17.85***	-4.99	-25.51***	-22.71***
	[-5.12]	[-0.25]	[-10.61]	[-5.02]
$Change\_Rel\_pct_{t-2}$	-10.52***		-18.80***	
	[-2.79]		[-10.46]	
$Change\_Rel\_pct_{t-3}$	-6.73		-13.06***	
	[-1.50]		[-9.76]	
$Change\_Rel\_pct_{t-4}$	-6.48*		-10.84***	
	[-1.75]		[-5.23]	
$Change\_Ind\_pct_t$	2.72**		0.19	
	[2.29]		[0.40]	
$Change\_Ind\_pct_{t-1}$	-0.08	-69.61***	-0.51***	-42.40***
	[-0.30]	[-30.78]	[-3.65]	[-17.13]
$Change\_Ind\_pct_{t-2}$		-56.57***		-23.70***
		[-20.25]		[-11.23]
$Change\_Ind\_pct_{t-3}$		-49.04***		-16.39***
		[-21.69]		[-10.76]
$Change\_Ind\_pct_{t-4}$		-32.93***		-11.73***
		[-21.75]		[-15.30]
$Change\_Rel\_pct_t$ X NEG_t		-129.74**		-25.27
		[-2.50]		[-1.47]
$Change\_Rel\_pct_{t-1}$ X NEG_{t-1}		-32.89		5.81
		[-1.24]		[0.78]
$Change\_Ind\_pct_t$ X NEG_t	-7.40***		-1.04	

	[-2.80]		[-1.47]	
Change_Ind_pct$_{t-1}$ X NEG$_{t-1}$	-3.67**		-0.54	
	[-2.43]		[-1.64]	
Ind_pct$_{t-5}$	-0.06	10.70***	0.01	-11.86***
	[-0.25]	[14.81]	[0.10]	[-25.72]
Rel_pct$_{t-5}$	-7.82	24.00***	-14.52***	-3.93
	[-1.26]	[3.49]	[-5.85]	[-1.62]
CAR[-1,1]$_t$	-0.18	10.00	0.29***	8.61***
	[-0.14]	[1.55]	[2.63]	[10.37]
CAR[-1,1]$_{t-1}$	-0.56	4.39	0.22	-0.21
	[-0.51]	[0.79]	[1.64]	[-0.22]
CAR[-1,1]$_t$ X NEG$_t$	2.76	-16.52	-0.14	-1.05
	[1.31]	[-1.33]	[-0.58]	[-0.79]
CAR[-1,1]$_{t-1}$ X NEG$_{t-1}$	3.17	0.50	-0.06	0.23
	[1.42]	[0.06]	[-0.29]	[0.22]
Size$_{t-1}$	0.11	-1.92***	0.01	-1.12***
	[1.45]	[-3.94]	[0.64]	[-6.86]
B/M$_{t-1}$	-0.11	-1.49***	-0.12***	-1.69***
	[-1.26]	[-3.15]	[-2.71]	[-5.79]
Age$_{t-1}$	0.01	0.14***	0.03***	0.29***
	[0.80]	[2.86]	[3.70]	[3.37]
Err$_{t-1}$	-0.22	4.28*	-0.20	2.68
	[-0.61]	[1.80]	[-0.73]	[1.60]
Numest$_t$	0.01*	-0.14***	0.00	-0.01
	[1.80]	[-4.52]	[0.99]	[-1.17]
Stdev$_t$	-0.61	-0.10	-0.41	-0.46
	[-1.50]	[-0.08]	[-1.44]	[-0.50]
Cum_return$_{t-1}$	-0.04	1.99***	0.02	4.33***
	[-0.55]	[3.59]	[0.47]	[9.50]
Beta$_t$	-0.01	0.02	0.00	0.08***
	[-1.07]	[0.46]	[0.57]	[2.75]
Residual$_t$	0.73	-45.21***	-1.53**	-47.71***
	[0.62]	[-5.74]	[-2.15]	[-10.56]
Volume[-10,10]$_t$	-0.00	0.02***	0.00	0.04***
	[-0.20]	[3.41]	[0.89]	[8.03]
Constant	-2.34	35.12***	-0.73	26.07***
	[-1.45]	[3.71]	[-1.62]	[7.10]
Observations	42,933	42,933	42,933	42,933
Number of firms	2,324	2,324	2,324	2,324
Wald Chi^2	123.1	3827		
Autocorrelation (Z-test)	-1.050	1.076		
R^2 (within)			0.11	0.26
Null: the sum of coefficients on *Change_Ind(Rel)_pct$_t$ and Change_Ind(Rel)_pct$_t$ X NEG$_t$* is 0.				
Wald test	6.23	0.06		
Prob>Chi^2	0.01	0.81		

Table 8 Trading Implications for Next SUE by Type of Institutions

This table reports whether the trading activities of institutions have information implications for next SUE and associated 3-day abnormal stock returns, 21-day abnormal trading volume, and residual risk using Arellano–Bover/Blundell–Bond linear dynamic panel-data estimation. The sample consists of firms that have ever had relationship institutions. Estimated coefficients in Columns (2) and (4) are scaled by a factor of 100. Unit of observations is firm-quarter. Robust standard errors are used to calculate z-values reported in brackets. The null hypothesis of no serial correlation at order two in the first-differenced errors for the dynamic panel is tested and reported at the bottom with the label "autocorrelation (Z-test)." See Appendix for variable definitions and associated data time frame. For example, Rel_pct_{t-1} is the most recent available relationship holding at the end of the quarter prior to earnings announcement. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

Dependent variables:	(1) SUE_t	(2) $CAR[-1,1]_t$	(3) $Volume[-10,10]_t$	(4) $Residual_t$
SUE_t		0.56***	0.05	-0.01
		[11.23]	[1.06]	[-1.31]
SUE_t				
X [=1, if Rel_pct_{t-1} *is 0]*		0.23***	0.04	-0.02
		[3.44]	[0.47]	[-1.62]
SUE_{t-1}	0.77***			
	[76.24]			
SUE_{t-2}	0.08***			
	[10.27]			
SUE_{t-3}	0.04***			
	[5.32]			
$CAR[-1,1]_{t-1}$		-1.12		
		[-1.30]		
$Volume[-10,10]_{t-1}$			-0.17***	
			[-18.26]	
$Volume[-10,10]_{t-2}$			-0.05***	
			[-5.68]	
$Volume[-10,10]_{t-3}$			-0.03***	
			[-3.18]	
$Residual_{t-1}$				30.34***
				[21.24]
$Residual_{t-2}$				9.76***
				[8.02]
$Residual_{t-3}$				6.97***
				[7.60]
$Change\_Ind\_pct_{t-1}$	0.02	-5.23***	1.95**	0.40***
	[0.20]	[-4.42]	[2.19]	[2.90]
Ind_pct_{t-2}	-0.14	-6.38***	-1.50	1.08***
	[-0.79]	[-3.92]	[-1.30]	[5.35]
$Change\_Rel\_pct_{t-1}$	-1.34*	-0.54	5.28	2.20***
	[-1.85]	[-0.14]	[0.99]	[3.46]
Rel_pct_{t-2}	-2.64***	1.05	11.60*	4.86***

	[-3.49]	[0.25]	[1.82]	[5.83]
NEG=1 if negative SUE_{t-1}		1.05***	-0.68***	0.02
		[9.05]	[-4.98]	[0.98]
$Size_{t-1}$	0.04	-8.03***	-0.12	0.39***
	[0.88]	[-18.14]	[-0.38]	[6.30]
B/M_{t-1}	0.13***	-0.44	1.00***	-0.17
	[2.92]	[-0.75]	[2.64]	[-1.56]
Age_{t-1}	-0.02**	0.44***	-0.08*	-0.07***
	[-2.57]	[4.69]	[-1.77]	[-6.27]
Err_{t-1}	-2.05***	-0.49	1.36	-0.27
	[-3.32]	[-0.47]	[1.10]	[-1.07]
$Numest_{t-1}$	-0.02***	0.00	0.00	0.01*
	[-3.68]	[0.11]	[0.08]	[1.89]
$Stdev_{t-1}$	1.56***	0.70	1.40	-0.20
	[5.20]	[0.83]	[0.91]	[-0.94]
Cum_return_{t-1}	0.32***	-0.58**	-0.12	-0.10**
	[9.65]	[-2.13]	[-0.49]	[-2.18]
$CAR[-1,1]_{t-1}$	-0.29***		3.37***	0.06
	[-2.88]		[5.12]	[0.35]
$Beta_{t-1}$	-0.00	-0.06	-0.01	-0.07***
	[-0.68]	[-1.55]	[-0.15]	[-3.17]
$Residual_{t-1}$	-1.86**	8.71	-150.04***	
	[-2.44]	[1.14]	[-24.36]	
$Volume[-10,10]_{t-1}$	-0.00	-0.00		-0.02***
	[-0.51]	[-0.68]		[-17.18]
Constant	-0.05	161.22***	9.53*	-5.85***
	[-0.06]	[17.84]	[1.67]	[-4.69]
Observations	50,904	56,848	50,904	50,922
Number of firms	2,691	3,012	2,691	2,694
Wald Chi^2	7401	1147	1735	1077
Autocorrelation (Z-test)	0.539	1.478	-0.328	0.611
Null Hypothesis: the sum of coefficients on *SUE_t* and *SUE_t X [=1, if Rel_pct_{t-1} is 0]* is 0				
Wald test		164.7	1.338	8.692
Prob>Chi^2		0.000	0.247	0.003

Table 9 Price Support Measure

This table reports average price support (PS) measures for relationship and independent institutions. The PS measure is calculated over the four quarters (the PS construction period) ending in the quarter of the current earnings announcement based on the following procedures. First, we calculate changes in institutional holdings ($\Delta hold_{i,t}$) for firm *i* quarter *t* and divide it by $\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|$, the sum of the absolute value of changes in institutional holdings over the past four quarters. Second, we calculate a $SUEindex_{i,t}$, a discrete index to measure the sign and magnitude of SUE for firm *i* in quarter *t*. Then, each firm *i* is ranked based on its quarter *t* SUE and assigned a $SUEindex_{i,t}$ value of -2, -1, 1 or 2. For firm *i* in quarter *t*, we multiply $\frac{\Delta hold_{it}}{\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|}$ by $SUEindex_{i,t}$ and sum the product across the PS construction period to obtain our measure (PS). A more positive (more negative) PS measure when $SUEindex_{i,t}$ is positive (negative) indicates more buying by institutions. *Rel_PS* and *Ind_PS* are price support measures for relationship and independent institutions, respectively. Panel A compares price support measures of relationship institutions and independent institutions for connected firms sorted by their average SUE quintile over the PS construction period. Panel B makes a similar comparison of price support measures of independent institutions for connected and unconnected firms. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

SUE quintile over PS construction period		1 (Low)	2	3	4	5 (High)
Panel A: Connected firms only						
Connected firms	Rel_PS	-0.193	-0.101	-0.002	0.224	0.450
Connected firms	Ind_PS	-0.091	-0.069	0.024	0.161	0.162
	Difference	-0.102**	-0.032	-0.026	0.064**	0.288***
	t-value	[-2.21]	[-1.08]	[-1.37]	[2.00]	[4.59]
Panel B: Connected and unconnected firms						
Connected firms	Ind_PS	-0.091	-0.069	0.024	0.161	0.162
Unconnected firms	Ind_PS	0.049	-0.036	0.067	0.192	0.262
	Difference	-0.139***	-0.033	-0.043**	-0.031	-0.100*
	t-value	[-3.41]	[-1.33]	[-2.14]	[-1.11]	[-1.94]

Table 10 Hedge Portfolio Returns Sorted on PS Measures

This table reports hedge portfolio (buy-minus-sell) returns based on PS measures. Cumulative abnormal returns (in %) are estimated from the Fama-French-Carhart four-factor model. Results are presented separately for samples with negative or positive average SUE over the PS construction period. Connected (unconnected) firms are those with (without) relationship institutions. Firms are sorted into quintiles based on the PS measure for either relationship institutions (Rel_PS) or independent institutions (Ind_PS). Hedge portfolios are formed by buying PS quintile 5 (extreme buy) firms and selling PS quintile 1 (extreme sell) firms. PS measures are constructed over months -12 to -1, where month 0 denotes the earnings announcement month. Corresponding windows for abnormal returns are in the brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, for a two-tailed test.

Avg. SUE	Negative during PS construction period			Positive during PS construction period		
Firm type	Connected		Unconnected	Connected		Unconnected
Sort on	Rel_PS	Ind_PS	Ind_PS	Rel_PS	Ind_PS	Ind_PS
PS measure construction period:						
[-12, -10]	0.65	5.22***	5.64***	0.43	3.01***	2.04***
[-9, -7]	0.67	4.82***	5.14***	0.01	2.61***	2.32***
[-6, -4]	-0.49	5.05***	2.91***	-1.00**	2.63***	1.94***
[-3, -1]	-1.31*	1.58**	-0.24	-1.47***	1.06***	1.19**
Two-year window following subsequent earnings announcements:						
[0, 0]	-0.35	-1.46***	-1.32**	-0.21	-0.55**	-0.01
[+1, +3]	-1.07	-1.37*	-2.40***	-1.68***	-1.01**	-0.54
[+4, +6]	-1.91***	-1.69**	-2.51***	-1.48***	-0.41	0.06
[+7, +9]	-1.49*	-1.71**	-2.44***	-2.10***	0.04	0.46
[+10, +12]	-2.84***	-1.43*	-0.38	-1.41***	-0.47	-0.14
[+13, +15]	-0.42	-2.03**	-1.17	-1.63***	0.20	0.04
[+16, +18]	-1.86***	-0.73	-0.88	-2.32***	0.10	0.68
[+19, +21]	-2.17***	-1.17	-0.41	-1.59***	-0.66	0.24
[+22, +24]	-1.24*	-0.29	-1.01	-1.29***	-0.44	-0.38

Figure 1: Indexed price levels of portfolios of connected firms with negative average SUEs

This graph shows indexed price levels based on cumulative abnormal returns (CARs) estimated from the Fama-French-Carhart four-factor model. The CARs plotted here are used to calculate the hedge portfolio returns presented in columns 1 and 2 of Table 10. For example, the returns used to generate the indexed prices for Rel (Buy) and Rel (Sell) correspond to the buy and sell portfolio returns used to generate the hedge portfolio returns in column 1 of Table 10. Plots are for connected firms with negative average SUEs over the PS construction period. Connected firms are those with relationship institutions. PS measures are constructed over months -12 to -1, where month 0 denotes the earnings announcement month. SUE is defined in section 3.2.