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Implications of limited investor attention to customer–supplier information transfers

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ABSTRACT

This study focuses on the market reaction to information transfers from economically linked customers. I examine whether investors have limited attention with respect to the information contained in customer earnings announcements for suppliers. Using 1083 unique customer–supplier relationships for the period 1983–2011, I find that the cumulative abnormal returns of a supplier surrounding and following linked customers' earnings announcements are positively related to the earnings information of the customers, suggesting that customer earnings announcements convey information to suppliers. I also find that the post-earnings announcement drift in customers contributes to the cross-firm reaction, and the predictability of customer earnings surprises for suppliers' future returns is not entirely due to limited investor attention.

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1. Introduction

This study aims to identify predictable returns by using ex ante economic links between customers and suppliers. Recent studies on the limited investor attention hypothesis,¹ which state that investors' limited attention to the arrival of new information causes return anomalies, show that investor inattention is more likely when a large number of same-day earnings announcements are made by other firms (Hirshleifer, Lim, and Teoh, 2009) or when there are a large number of Friday earnings announcements (Dellavigna & Pollet, 2009). Investor inattention is also more likely when publicly available information about economically linked firms is neglected (Cohen & Frazzini, 2008). More importantly, evidence on the limited attention to economically linked firms suggests that information diffuses from customers to suppliers, generating predictable returns across linked assets.

In this paper, I examine whether investors have limited attention with respect to the information contained in customer earnings announcements for suppliers. More specifically, I investigate the immediate responsiveness of a firm's abnormal returns surrounding the announcement dates of its linked customers as well as the delayed responsiveness of stock returns following linked customers' earnings announcements. The disclosure of customer–supplier links between firms was required according to Statement of Financial Accounting Standards (SFAS) No. 14 before 1997 and based on SFAS No. 131 after 1997, and this information is available for public use. When news about a linked firm is released to the market, the stock price of the supplier firm should respond immediately to that news if investors consider these ex ante links. In contrast, if investors pay limited attention to such links, the stock price of the supplier will react slowly to the linked firm's earnings news, and delayed abnormal returns can be expected. As a result, limited investor attention to a linked firm's announcements (i.e., a customer's unexpected earnings news)² leads to market underreactions.

By examining 1083 unique customer–supplier relationships between 1983 and 2011, I find that the cumulative abnormal

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¹ The limited attention hypothesis by Cohen and Frazzini (2008) states that stock prices underreact to firm-specific information that induces changes in the valuation of related firms, generating return predictability across assets. In particular, stock prices underreact to negative (positive) news involving related firms and, in turn, generate negative (positive) price drift.

² Unexpected earnings news, unexpected earnings, earnings surprises, earnings news, and earnings-related information are exchangeable terms in this paper.

returns of a supplier surrounding and following linked customers' earnings announcements are positively related to the unexpected earnings news of customers. The findings indicate that there is a direct, immediate relation between supplier returns and customer earnings surprises, and customer earnings surprises are positively related to post-customer earnings announcement supplier returns. Additionally, these results are robust to controlling the same-industry effect, the ratios of firm size, and the percent of supplier sales from the linked customer, as well as with respect to the delayed returns over different horizons and the alternative measures of earnings surprises. Because customer–supplier links between firms are typically associated with information transfer, the main results suggest that limited investor attention to the arrival of new information about economically linked firms generates abnormal stock returns.

The limited investor attention hypothesis by [Cohen and Frazzini \(2008\)](#) argues that customer returns predict suppliers' future returns because investors pay limited attention to the customer–supplier link. To identify whether the predictability of supplier returns is the consequence of increases in customer returns due to customer earnings surprises, I further test how much the customer post-earnings announcement drift contributes to the cross-firm reaction between supplier returns and customer earnings surprises. The evidence supports the notion that an investor's underreaction to a customer's earnings surprise leads to a drift in the customer's post-earnings announcement returns ([Bernard & Thomas, 1989](#)), which, in turn, is reflected in the supplier's returns. In other words, the post-earnings announcement drift in customers contributes to the cross-firm reaction, and the predictability of customer earnings surprises for suppliers' future returns is not entirely due to limited investor attention to earnings-related information transfers.

This paper contributes to the existing literature in several ways. First, the paper adds to the growing stream of studies on the implications of limited attention for stock returns. [Cohen and Frazzini \(2008\)](#) examine how investors' limited attention to economically related firms leads to predictable future stock returns by testing “customer momentum”, which is defined as a monthly strategy of buying firms whose customers had the most positive returns in the previous month and selling firms whose customers had the most negative returns in the previous month. If investors pay limited attention to the stock returns of economically linked firms, one would expect investors to be inattentive to earnings-related information from such firms. Consequently, I hypothesize that market underreactions for suppliers are related to limited investor attention to earnings announcements by economically linked customers. I test this hypothesis by examining immediate (delayed) market reactions surrounding (following) earnings announcements by economically linked customers. Although most studies investigate market reactions around the time of a firm's own earnings announcements,³ I focus on market reactions around the time of earnings announcements by related firms because investors tend to ignore the publicly available link between suppliers and economically related customers. That is, investors are inattentive to customer–supplier links, and stock returns are therefore predictable.

Second, this study provides new insight into information diffusion. The customer–supplier links between firms are longstanding public relationships. Thus, the earnings information released by customers is closely related to the earnings information for suppliers. Prior studies have shown that one firm's earnings news can be useful in updating earnings expectations for other firms in the industry.⁴ For instance, [Ramnath \(2002\)](#) examines intra-industry information diffusion by investigating the market reaction experienced by a firm that announces its earnings subsequent to the first announcing firm in the same industry when the earnings of the latter are unexpected. A recent study by [Kovacs \(2011\)](#) further shows that a firm's post-earnings announcement drift is driven by information diffusion from subsequent-announcing industry peers. If earnings information is transferred from other firms in the industry, one would also expect that investors would perceive the earnings-related information from economically related announcing customers to be useful in updating their expectations for suppliers. Thus, earnings information would be expected to be transferred from economically related firms. I find that the immediate and delayed returns of a supplier⁵ surrounding and following customers' earnings announcements are positively related to customers' unexpected earnings, confirming that customer earnings announcements convey information for suppliers.

The remainder of the paper is organized as follows. Section 2 reviews the related studies and develops hypotheses. Section 3 presents the sample selection and research design. The empirical results are provided in Section 4. Section 5 reports several robustness checks. Finally, Section 6 concludes the paper.

2. Related studies and hypotheses

2.1. Limited investor attention

This paper builds on the finance literature on limited investor attention and its effects on financial markets. Recent empirical studies have related limited investor attention to asymmetric selling behavior ([Barber & Odean, 2008](#)), demographic shifts ([Dellavigna & Pollet, 2007](#)), and relevant information at the time of previous extraneous news ([Huberman & Regev, 2001](#)). Using share turnover as a proxy for investor attention, [Hou, Peng, and Xiong \(2009\)](#) show that price underreaction to earnings news is weak when investors are attentive, but the price drift caused by investors' overreaction is strong with investor attention. In the same vein, [Loh \(2010\)](#) finds that investor inattention and the underreaction to stock recommendations lead to post-recommendation drift. In contrast, [Da, Engelberg, and Gao \(2011\)](#) use the Google search volume index (SVI) as a proxy for investor attention and show stronger price momentum among stocks with higher levels of SVI. [Yuan \(2012\)](#) finds that high market-wide attention generates heavy trading and price changes by analyzing the ability of market-wide attention-grabbing events, which are measured as record-breaking events for the Dow index and front-page articles about the stock market. [Bae and Wang \(2012\)](#) investigate whether the China-name affects investor attention and firm value and find that the returns of China-name stocks are, on average, more than 100% higher than those of non-China-name stocks. Bae and Wang attribute this phenomenon

⁴ Earnings-related information transfers in the industry examined in prior studies include, among others, [Freeman and Tse \(1992\)](#), [Ramnath \(2002\)](#), and [Kovacs \(2011\)](#).

⁵ On the basis of Regulation SFAS No. 131, the suppliers need to report the identity of customers representing more than 10% of their total sales in interim financial reports issued to shareholders. Thus, the customer is important to suppliers based on sales. However, there is no information available about how important the supplier is to the customer. Therefore, this study only focuses on the effects of customer earnings surprises on supplier returns.

³ [Koch and Sun \(2004\)](#) test announcement reactions around the firm's subsequent dividend changes conditioned on the sign of the firm's unexpected earnings. [Kovacs \(2011\)](#) examines the effect of same-industry peers' earnings announcements on the post-earnings announcement drift. [Cohen and Frazzini \(2008\)](#) investigate market reactions to news about related firms but do not relate the phenomenon to the price response of suppliers around (after) the customer's earnings announcement.

to increased investor attention to China-name stocks after controlling for alternative measures of investor attention, such as *Wall Street Journal* news coverage, abnormal trading volume, extreme past one-day returns, and the Google SVI. Gilbert, Kogan, Lochstoer, and Ozyildirim (2012) use the U.S. Leading Economic Index as a proxy for stale information and find that investor inattention to the stale nature of information causes return anomalies.

The literature also discusses theoretical approaches to modeling limited investor attention. For instance, Merton (1987) suggests that higher expected stock returns are obtained from lesser-known stocks with smaller investors. Hong and Stein (1999) suggest that investor profit from trading on information is gradually transferred across the population if the information is helpful in predicting future outcomes. Hirshleifer and Teoh (2003) model how investors' inattention to accounting reports can lead to the misvaluation of stocks. Peng and Xiong (2006) demonstrate that investors are more likely to respond to market- and industry-wide information than they are to consider firm-specific information, which makes cross-sectional returns predictable. Finally, Peng (2005) develops a model in which the learning process for investors is optimally allocated when they have a limited capacity for information processing. Peng further predicts that mispricing is related to the speed with which investors process information about large or small firms.

2.2. Information transfers

Several studies also focus on the role of information transfers in the prediction of future stock returns. For instance, Ramnath (2002) finds that the response to subsequent-announcing firms around the first announcement date in the industry is positive when the earnings of the first announcing firm are unexpected. The underreaction, in turn, leads to predictable stock returns for subsequent announcers in the same industry. In the same vein, Hong, Torous, and Valkanov (2007) suggest that some industries predict future stock market returns. A recent study by Desir (2013) finds that managers of non-announcing firms are more likely to release good news to minimize the impact of negative information transfers from their industry competitors. Cohen and Frazzini (2008) and Menzly and Ozbas (2010) find that individual customer returns generate predictable future returns for suppliers. The former study focuses more broadly on customer–supplier links. By contrast, the latter study examines specific inter- and intra-industry relations.

Prokopczyk (2010) reports strong evidence that earnings news leads to a substantial contagion effect in the banking industry, but outside that industry, the magnitude of the contagion effect is positively related to the bank size. Similarly, Jorion and Zhang (2010) investigate the information transfer effects of bond rating downgrades and find evidence of a predominant contagion effect for investment-grade firms. A recent study by Cai, Song, and Walkling (2011) finds strong evidence that bidder abnormal returns are positively related to the degree of surprise associated with a bid announcement, and the prices of rival firms adjust at the time of an initial industry bid, suggesting the transfer of bid-related information through industry channels. Using the degree of accessibility of foreign investors to emerging stock markets as a proxy for the investibility of foreign investments, Bae, Ozguz, Tan, and Wirjanto (2012) find that greater investibility is associated with faster diffusion of global market information across stocks in emerging markets.

However, recent studies have shown that information transfers play an important role in the post-earnings announcement drift. Among others, Kovacs (2011) presents strong evidence that subsequent same-industry earnings announcements are related to a firm's post-earnings announcement drift. Hou (2007) argues that

the industry information transfer from large firms to small firms contributes to the post-earnings announcement drift.

2.3. Hypothesis development

My study is distinct from other articles in that I analyze earnings-related information diffusion from customers to suppliers. That is, I test how a supplier's abnormal returns around the customer's earnings announcement date react to the unexpected earnings by linked customers (see the relationship in arrow #3 in Fig. 1). In a closely related paper, Cohen and Frazzini (2008) examine how limited investor attention to economically related firms leads to predictable future stock returns (see the relationship in arrow #2 in Fig. 1), whereas Ramnath (2002) investigates investor and analyst reactions to earnings announcements by related firms in the industry. A recent study by Kovacs (2011) further shows that a firm's post-earnings announcement drift is driven by information diffusion from subsequent-announcing firms in the same industry. If the corresponding price drift of the firm can be predicted based on earnings-related information from subsequent-announcing firms in the same industry, one would expect the stock price reactions of the firm surrounding the earnings report date of related firms to reflect this information. Therefore, investors can incorporate the information from linked customers' earnings announcements into their expectations for suppliers. In an efficient market, one would expect the immediate price responses for a supplier encompassing its linked customers' earnings announcements to reflect those announcements. Thus, the stock price responses of a supplier around its customers' announcements should be positively related to unexpected customer earnings. I therefore present the following hypothesis:

H_{1a}: The cumulative abnormal return of a supplier surrounding the linked customers' announcement date is positively related to the linked customers' earnings news.

However, prior studies (e.g., Abarbanell & Bernard, 1992; Bernard & Thomas, 1989; Ramnath, 2002) have shown that investors cannot completely adjust their earnings expectations for announcing firms and that this dynamic leads to predictable stock returns (see the relationship in arrow #1 in Fig. 1). More specifically, investor underreactions to the first announcer's news yield predictable stock returns for subsequent announcers in the same industry (Ramnath, 2002). If investors are inattentive to earnings-related information from economically related customers, they cannot immediately react as strongly to earnings-related information. Therefore, the corresponding drift in prices (i.e., the abnormal returns of a supplier cumulated after the customers' earnings announcement date) would be predictable even after the customers' actual earnings are released to the market. Thus, one would expect that the stock returns of a supplier cumulated after the customers' earnings announcement date should be positively related to unexpected customer earnings.

H_{1b}: The abnormal return of a supplier cumulated after the linked customers' announcement date is positively related to the linked customers' earnings news.

The discussion above suggests that limited investor attention to a linked firm's announcement (i.e., customers' unexpected earnings news) leads to market underreactions. This underreaction generates predictable stock returns for suppliers following the customers' earnings announcements. That is, stock prices do not promptly incorporate information from linked firms, generating substantial abnormal returns.

The Focus of this Study Comparing to the Literature

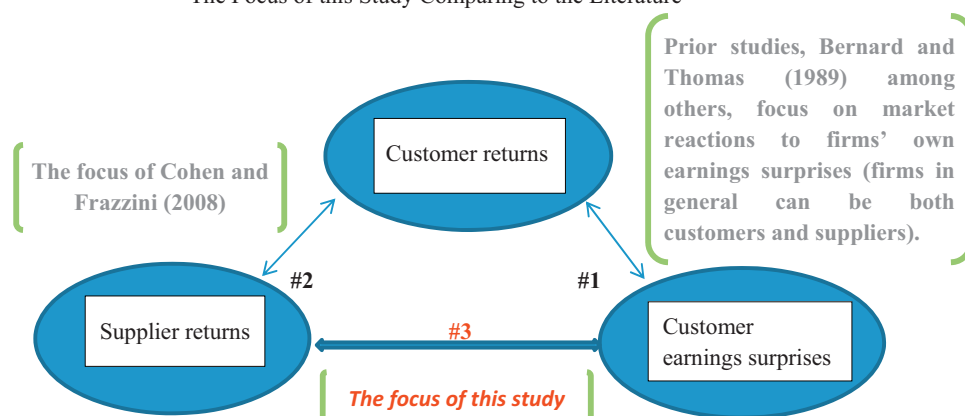


Fig. 1. The focus of this study comparing to the literature.

3. Data and research design

3.1. Sample selection

To empirically investigate the relation between the supplier's cumulative abnormal returns surrounding (following) linked customers' earnings announcements and an earnings surprise for the customer, I obtained data from three sources: the Compustat segment, which provides linked data for suppliers and their principal customers; *CRSP*, which provides information on stock returns; and the Institutional Brokers' Estimate System (IBES), which provides data on quarterly earnings and the timing of announcements.

According to Regulation SFAS No. 131, firms must periodically release their financial information for any industry segment that comprises more than 10% of consolidated annual sales and for any linked customer that represents more than 10% of total reported sales. Based on the Compustat segment file for each firm, I examine whether the customer is another company listed in the *CRSP*, Compustat, and IBES files by matching the customer name, and I assign it the corresponding *CRSP* permno number to ensure that customers are matched to the appropriate stock returns and financial information.⁶

I extract stock returns from *CRSP* based on the announcement dates of both suppliers and their linked customers at the same fiscal quarter end. To construct the unexpected earnings, I require the actual earnings and analyst forecasts. The IBES unadjusted individual analyst forecasts for quarterly earnings per share (EPS) are based on the number of shares outstanding on the estimate date. By contrast, the actual reported EPS are based on the number of shares outstanding on the earnings report date. To ensure that both estimated and actual EPS are based on the same number of shares outstanding, I use the *CRSP* cumulative adjustment split factor extracted from the *CRSP* daily stock files. Merging these data with the unadjusted detailed history and the data from the actual files in the IBES database, I generate the final sample of 10,206 firm-quarter observations for the period 1983–2011, which cover a total of 1083 unique customer–supplier relationships.

3.2. Research design

I examine market reactions to earnings news involving linked customers by estimating several specifications of the following

model:

$$CAR[-1, 1] = \alpha + \beta_1 SUE + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon \quad (1)$$

$$CAR[2, 61] = \alpha + \beta_1 SUE + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon \quad (2)$$

where the dependent variable $CAR[-1, 1]$ ⁷ is defined as a supplier's three-trading-day cumulative abnormal returns around the customer's earnings announcement, and $CAR[2, 61]$ is defined as the supplier's subsequent 60-trading-day cumulative abnormal returns after the customer's earnings announcement. The independent variable *SUE* is the customer's standardized unexpected earnings.⁸ To obtain *SUE*, I first compute the customer's unexpected earnings (*CUE*) as the actual earnings per share subtracted from the median of the individual analyst forecasts,⁹ deflated by the stock price on the date of the fiscal quarter end. Then, I rank *CUE* into ten deciles based on the sample distribution of customer earnings surprises by quarter in each industry and then scale them between 0 and 1 (Bartov, Radhakrishnan, and Krinsky, 2000; Bernard & Thomas, 1990; Hirshleifer et al., 2009; Zhang, 2008).

Z is a vector of control variables that are routinely used in return anomaly regressions (e.g., Cohen & Frazzini, 2008; Hirshleifer et al., 2009; Ramnath, 2002). *CBNEWS* is an indicator variable that equals 1 if the customer's unexpected earnings are negative and 0 otherwise. *CANALYSTS* represents the number of analysts following the customer, and *FANALYSTS* represents the number of analysts following the supplier. *RCANALYSTS* is the ratio of the number of analysts following the customer to the number of analysts following the supplier (i.e., the ratio of *CANALYSTS* to *FANALYSTS*). *CSALE* is the dollar amount of sales of the supplier to a particular customer, and *FSALE* is the total amount of sales yielded by a supplier. *PERCSALE* represents the percent of the supplier's sales from an

⁷ To more accurately assess the potential trading profits of investors, researchers should capture the immediate stock price response to earnings using days -1, 0, and +1 and the delayed stock price response to earnings beginning returns on day +2 (Battalio and Mendenhall, 2011).

⁸ To address the possibility of outliers in my sample, I use scaled-decile ranks in place of the *CUE* variable in the main analysis as in Bernard and Thomas (1990) and Battalio and Mendenhall (2005).

⁹ Some studies (e.g., Zhang, 2008) have used the latest individual analyst forecast to compute a firm's unexpected earnings. I use the latest analyst consensus forecast in my study. However, the inferences are unchanged if I use the latest individual analyst forecast as a proxy for market expectations.

⁶ Unmatched customers are excluded from the sample.

Table 1
Summary statistics.

Variables	N	Mean	SD	P25	Median	P75
Panel A: Summary statistics for full sample						
CBNEWS	10,206	0.359	0.480	0.000	0.000	1.000
CANALYSTS	10,206	20.321	15.415	9.000	17.000	28.000
CSALE	10,206	0.284	0.937	0.011	0.038	0.132
CSIZE	10,205	57.900	81.000	7.233	26.700	73.800
FANALYSTS	10,206	7.238	7.978	2.000	5.000	9.000
FSALE	10,206	1.975	5.979	0.093	0.313	1.019
FSIZE	10,176	3.265	11.900	0.187	0.520	1.771
PERCSALE	10,181	0.895	24.600	0.060	0.109	0.214
PERCSIZE	10,175	2.887	13.438	0.055	0.394	1.862
RCANALYSTS	10,206	6.378	8.430	1.500	3.400	7.667
SAMEDAY	10,206	0.065	0.246	0.000	0.000	0.000
SAMEINDUSTRY	10,206	0.098	0.297	0.000	0.000	0.000
		CUE	SUE	CAR[−1,1]	CAR[2,61]	CCAR[2,61]
Panel B: Supplier and customer returns by customer earnings surprises						
	1	−1.598	0.100	0.151	2.551	1.915
	2	−0.024	0.250	0.414	0.896	−0.057
	3	0.035	0.446	0.288	0.887	0.406
	4	0.125	0.618	−0.003	1.643	0.491
	5	0.941	0.776	0.308	2.803	1.801

Notes: This table presents the summary statistics for all variables used in the main regression analysis of the impact of customer earnings surprises on supplier returns. The sample consists of 1083 unique customer–supplier relationships for the period 1983–2011. The appendix outlines the definitions and data sources for the variables. Panel A reports the number of observations, the mean, median, 25th and 75th percentile, and the standard deviation for all variables used in the main analysis. Sales are in billions and firm sizes are in millions. PERCSIZE is scaled by a factor of 1/100. Panel B reports supplier and customer returns in different CUE quintiles. Returns and CUE are in percent.

economically linked customer (i.e., the ratio of CSALE to FSALE). CSIZE and FSIZE are market capitalization of customers and suppliers, respectively, where market capitalization is defined as price times the number of shares outstanding at the end of the fiscal quarter. PERCSIZE is the ratio of market capitalization of linked customers to that of suppliers (i.e., the ratio of CSIZE to FSIZE). MKTRET represents the market return on the S&P 500 Index surrounding the customers' earnings announcement date. SAMEDAY is an indicator variable that equals 1 if both the supplier and its linked customers report their earnings on the same day and 0 otherwise. SAMEINDUSTRY is an indicator variable that equals 1 if both the supplier and its linked customers are in the same industry and 0 otherwise. I also control for industry (according to the ten-industry classification in Fama and French, 1997) and year effects. ε denotes the error term. Details regarding the construction of the variables are given in the Appendix.

Table 1 presents the summary statistics for the variables in the full sample. Panel A reports the number of observations, the mean, median, 25th and 75th percentiles, and the standard deviation for the variables used in the main analysis. There are 1083 unique customer–supplier relationships for the period 1983–2011 in the final sample. The indicator variable of customer bad earnings news (0.359) shows that bad earnings news is less frequently observed for customers in the sample. On average, there are approximately 20 analysts following the customer and seven analysts following the supplier. The market value of a customer's equity is approximately \$57.9 million, and the market value of a supplier is approximately \$3.3 million. The supplier's total reported sales are approximately \$2.0 billion, from which approximately \$0.3 billion of the supplier's sales are from the linked customer in the sample. The evidence that the linked customer representing more than 10% of the supplier's total reported sales on average in my sample is in line with the reporting requirements by Regulation SFAS No. 131 and is consistent with Cohen and Frazzini (2008). With regard to same-day announcements, 6.5% of sample firms are suppliers that release their quarterly earnings on the same day as their linked firms. In the final sample, 9.8% of firms are suppliers that are in the same industry as their linked firms.

Panel B reports supplier and customer returns in different quintiles of customer earnings surprises. It shows that suppliers in the second quintile have the highest average abnormal return (0.4%) over the customer's three-day event window. With respect to the delayed returns for both suppliers and customers, the highest average abnormal returns are likely distributed to the lowest and highest quintiles. Overall, the evidence shows that the average delayed stock reactions of supplier returns to the customer earnings announcement are stronger than the customer's delayed return reactions to the customer earnings announcement. The evidence suggests that there are observable post-customer earnings announcement supplier returns generated after the customer earnings announcement date.

4. Empirical results

Because firm-specific information, such as customer earnings announcements, recurs systematically and induces changes in the valuation of economically related firms, it has the potential to play a substantial role in the supplier's returns. To gain insight into the relation between the stock returns of a supplier and the earnings news of its linked customers, I investigate the immediate (delayed) price reaction of the supplier surrounding (following) customer announcements to the unexpected earnings of its linked customers. If investors are aware of the ex ante customer–supplier links, the stock returns of the supplier will fully adjust when information about its linked customers is released into the market. If investors do not fully react to information released by the supplier's linked customers, one can expect to observe predictable supplier returns following customer announcements.

4.1. Supplier stock price reactions to earnings news involving linked customers

Table 2 reports the regression results. Columns 1–4 present the specifications with the supplier's three-trading-day cumulative abnormal returns surrounding the earnings announcement date for its linked customers, $CAR[-1, 1]$, as the dependent variable. Each regression employs control variables that have the potential

Table 2Test of supplier's stock price reaction surrounding customer announcements (H_{1a}).

Variables	$CAR[-1, 1] = \alpha + \beta_1 SUE + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon$			
	(1) CAR[-1, 1]	(2) CAR[-1, 1]	(3) CAR[-1, 1]	(4) CAR[-1, 1]
SUE	0.309 [*] (1.76)	0.305 [*] (1.73)	0.583 ^{***} (2.81)	0.532 ^{**} (2.57)
RCANALYSTS	0.006 (0.55)	0.006 (0.55)	0.014 (0.82)	0.014 (0.84)
PERCSALE	0.036 (0.46)	0.036 (0.46)	0.112 (0.21)	0.111 (0.21)
PERCSIZE	0.007 (0.67)	0.007 (0.67)	0.038 (1.51)	0.038 (1.50)
SAMEDAY	0.140 (0.38)	0.131 (0.36)	0.323 (0.46)	0.360 (0.50)
MKTRET	0.135 [*] (1.84)	0.135 [*] (1.85)	0.150 (1.35)	0.150 (1.35)
SUE × RCANALYSTS			−0.028 (−0.96)	−0.029 (−0.98)
SUE × PERCSALE			−0.157 (−0.18)	−0.154 (−0.17)
SUE × PERCSIZE			−0.056 [*] (−1.75)	−0.055 [*] (−1.74)
SUE × SAMEDAY			−0.477 (−0.40)	−0.563 (−0.46)
SUE × MKTRET			−0.038 (−0.18)	−0.039 (−0.19)
SAMEINDUSTRY		0.098 (0.38)		−0.233 (−0.57)
SUE × SAMEINDUSTRY				0.741 (1.00)
N	10,149	10,149	10,149	10,149
R ²	0.007	0.007	0.008	0.009

Notes: This table presents the estimation results obtained by regressing the supplier's cumulative abnormal returns around the customer's earnings announcement ($CAR[-1, 1]$) on the customer's standardized unexpected earnings (SUE), on several controls, and on the interaction terms between SUE and controls. The Appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, industry and year controls are included but are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSALE and PERCSIZE are scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

to influence the supplier's immediate returns and considers industry and year effects. Standard errors¹⁰ of regression coefficient estimates are corrected for clustering by the supplier firm. Columns 1–2 provide the results without interaction terms. Column 1 provides the baseline result for the immediate price reaction of a supplier surrounding customer announcements to customer unexpected earnings. I control for RCANALYSTS, PERCSALE, PERCSIZE, SAMEDAY, and MKTRET. The coefficient of SUE is 0.309 and is statistically significant at the 10% level, confirming the presence of the immediate return predictability of a supplier around customer announcements in my sample. In column 2, I add a control variable of SAMEINDUSTRY. The coefficient of SUE is significantly positive at 0.305. Columns 3 and 4 present the results with the same controls in columns 1 and 2, respectively, and their interaction terms with SUE. The coefficients of SUE in columns 3 and 4 are significantly

positive at 0.583 and 0.532, respectively. The effects of customer earnings surprises are also economically significant. The use of the scaled-decile rank SUE measure¹¹ suggests that a change in the customer earnings surprises from the lowest decile to the highest decile is associated with an increase in the supplier's immediate abnormal returns by approximately 0.5%.

Taken together, the evidence in Table 2 indicates that the cumulative abnormal return of a supplier around customer announcements is positively related to the unexpected earnings of linked customers.

4.2. Supplier stock price reactions following the customer announcements

The immediate responsiveness of stock returns surrounding customer announcements, as indicated above, offers important evidence of the market reactions to earnings news involving the customers of suppliers. However, Cohen and Frazzini (2008) report that stock prices do not fully reflect news involving related firms, which generates predictable subsequent price moves. Accordingly,

¹¹ In an unreported table, I also standardize the difference between the actual earnings per share and the median of the individual analyst forecasts with the cross-sectional standard deviation of earnings forecasts. The magnitude and sign of the coefficient estimates of SUE are similar to those in Table 2, implying that there is a 0.5-basis-points immediate supplier's return response to a one-standard-deviation increase in customer earnings surprises.

¹⁰ The methods used for estimating standard errors in the regressions in this study are based on White standard errors, which are robust to misspecification and within-cluster correlation. The formula for the robust cluster variance estimator is $V = (X'X)^{-1} \sum_{j=1}^{n_C} u_j u_j' (X'X)^{-1}$ where $u_j = \sum_{i \in \text{cluster } j} e_i x_i$, n_C is the total number of clusters, e_i is the residual for the *i*th observation, and x_i is a row vector of predictors including the constant. The robust estimator of variance relaxes the assumption of independence (i.e., the observations are independently and – but not necessarily – identically distributed) and requires only that the observations be independent across the clusters. Thus, even if the within-cluster observations are correlated, running regressions with a robust cluster variance estimator can produce “correct” standard errors in the measurement sense. (See STATA User's Guide, Release 13, 20.21 Obtaining robust variance estimates)

Table 3Test of supplier's stock price reaction following customer announcements (H_{1b}).

Variables	$CAR[2, 61] = \alpha + \beta_1 SUE + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon$			
	(1) CAR[2,61]	(2) CAR[2,61]	(3) CAR[2,61]	(4) CAR[2,61]
SUE	2.787*** (3.67)	2.788*** (3.67)	2.682*** (3.01)	2.637*** (2.99)
RCANALYSTS	0.123*** (3.31)	0.123*** (3.31)	0.084 (1.58)	0.085 (1.58)
PERCSALE	1.080*** (9.29)	1.080*** (9.29)	0.500 (1.42)	0.498 (1.41)
PERCSIZE	0.050 (0.91)	0.050 (0.91)	0.085 (1.28)	0.085 (1.28)
SAMEDAY	-1.424 (-1.51)	-1.422 (-1.49)	0.784 (0.48)	0.836 (0.50)
MKTRET	0.326 (1.18)	0.326 (1.18)	0.253 (0.47)	0.252 (0.47)
SUE × RCANALYSTS			0.096 (0.79)	0.095 (0.78)
SUE × PERCSALE			1.138* (1.71)	1.141* (1.71)
SUE × PERCSIZE			-0.068 (-0.61)	-0.068 (-0.60)
SUE × SAMEDAY			-5.069* (-1.84)	-5.161* (-1.81)
SUE × MKTRET			0.183 (0.23)	0.183 (0.23)
SAMEINDUSTRY		-0.023 (-0.03)		-0.364 (-0.20)
SUE × SAMEINDUSTRY				0.746 (0.22)
N	10,140	10,140	10,140	10,140
R ²	0.026	0.026	0.026	0.026

Notes: This table presents the estimation results obtained by regressing the supplier's cumulative abnormal returns following the customer's earnings announcement (CAR [2,61]) on the customer's standardized unexpected earnings (SUE), on several controls, and on the interaction terms between SUE and controls. The Appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, the industry and year controls are included but are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSALE and PERCSIZE are scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

I further investigate the cumulative stock return responses of a supplier to customers' unexpected earnings following customer announcements.

Table 3 reports the estimation results. Columns 1–4 present the specifications with the abnormal returns of a supplier's cumulated 60-trading-day after the earnings announcement date for its linked customers, CAR [2,61], as the dependent variable. The independent and control variables used in the delayed stock return analysis are the same as in the immediate stock return analysis. Standard errors of regression coefficient estimates are corrected for clustering by the supplier firm. The coefficients of SUE in columns 1–4 are all positive and significant at the 1% level with magnitudes of 2.787, 2.788, 2.682, and 2.637 respectively. The coefficient estimates on SUE in regressions 1–4 imply that a change in customer earnings surprises from the lowest decile to the highest decile is associated with an increase in the supplier's delayed abnormal returns of approximately 3.0% after the customer post-earnings announcement. The positive and economically significant coefficient is in line with the hypothesis and suggests that the stock reactions of a supplier after linked customer earnings announcements to unexpected customers' earnings are substantial.

Overall, the results in Tables 2 and 3 show that stock prices do not promptly incorporate information from linked firms, which, in turn, generates the abnormal returns for suppliers cumulated after earnings announcements by related customers. These results are consistent with the notion that systematic limited attention to a given piece of information predicts return forecastability with respect to the impact on the firm value of the piece of information

that is ignored. Thus, the results provide support for the hypothesis that limited investor attention to economic links causes market underreactions.

4.3. How much the post-earnings announcement drift in customer returns contributes to the delayed supplier reaction to customer earnings surprises

The limited investor attention hypothesis by Cohen and Frazzini (2008) argues that customer returns predict the supplier's future returns because investors pay limited attention to the customer–supplier link. Although the second hypothesis discussed above supports a delayed supplier reaction to customer earnings announcements, it is of interest to identify how much the post-earnings announcement drift in customer returns contributes to the established supplier reaction to customer earnings announcements.

In a scheme in which customer earnings surprises lead to customer returns and the latter, in turn, affect supplier returns, the post-earnings announcement drift in customer returns has the potential to play a substantial role in the observed cross-firm reaction between supplier returns and customer earnings surprises. From this perspective, the predictability of supplier returns is simply the consequence of increases in customer returns due to customer earnings surprises. Thus, I argue that customer earnings surprises might predict suppliers' future returns for two possible and not mutually exclusive reasons: (i) investors pay limited attention and do not fully incorporate economic links, leading to

Table 4

Test of how much the customer post-earnings announcement drift contributes to the cross-firm reaction.

Variables	CAR[2, 61] = $\alpha + \beta_1 SUE + \theta_1 CCAR[2, 61] + \theta_2 (CCAR[2, 61] \times SUE) + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon$			
	(1) CAR[2,61]	(2) CAR[2,61]	(3) CAR[2,61]	(4) CAR[2,61]
SUE	2.442*** (2.81)	2.351*** (2.74)	2.326*** (2.66)	2.241*** (2.59)
CCAR [2,61]	0.276*** (10.56)	0.276*** (10.56)	0.248*** (6.21)	0.249*** (6.22)
SUE \times CCAR[2,61]			0.072 (1.03)	0.071 (1.02)
RCANALYSTS	0.077 (1.46)	0.078 (1.47)	0.078 (1.46)	0.079 (1.47)
PERCSALE	0.373 (1.31)	0.370 (1.29)	0.363 (1.28)	0.361 (1.26)
PERCSIZE	0.089 (1.31)	0.089 (1.30)	0.088 (1.29)	0.088 (1.29)
SAMEDAY	0.697 (0.43)	0.801 (0.48)	0.708 (0.44)	0.804 (0.48)
MKTRET	0.275 (0.52)	0.274 (0.52)	0.278 (0.53)	0.277 (0.52)
SUE \times RCANALYSTS	0.130 (1.06)	0.128 (1.04)	0.133 (1.08)	0.131 (1.06)
SUE \times PERCSALE	1.373*** (3.01)	1.379*** (3.00)	1.396*** (3.06)	1.401*** (3.04)
SUE \times PERCSIZE	−0.066 (−0.58)	−0.066 (−0.57)	−0.064 (−0.56)	−0.063 (−0.55)
SUE \times SAMEDAY	−4.659* (−1.72)	−4.844* (−1.74)	−4.635* (−1.72)	−4.807* (−1.73)
SUE \times MKTRET	0.129 (0.16)	0.129 (0.16)	0.121 (0.15)	0.120 (0.15)
SAMEINDUSTRY		−0.726 (−0.40)		−0.666 (−0.37)
SUE \times SAMEINDUSTRY		1.511 (0.46)		1.414 (0.44)
N	10,137	10,137	10,137	10,137
R ²	0.050	0.050	0.050	0.050

Notes: This table presents the estimation results for the cross-sectional relation between customer earnings surprises (SUE), customer returns (CCAR [2,61]), and supplier returns (CAR [2,61]). The models augment the basic specifications of H₁₀ in Table 3 by including the cumulated post-earnings announcement returns of the customer (CCAR [2,61]) and its interaction term with the customer's standardized unexpected earnings (SUE). The appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, industry and year controls are included but are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSALE and PERCSIZE are scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

the cross-firm reaction between supplier returns and customer earnings surprises; and (ii) the investor's underreaction to the customer's earnings surprise leads to a drift in the customer's post-earnings announcement returns (Bernard & Thomas, 1989), which, in turn, is reflected in the supplier's returns because investors take economic links into account rationally and efficiently.

To test for these two explanations empirically, I estimate a regression including the cumulated post-earnings announcement return of the customer (CCAR [2,61]) and its interaction term with the customer's standardized unexpected earnings (SUE). The coefficient on the customer's earnings surprise (β_1) provides an interpretation of limited investor attention to economic links. The coefficient on the customer's cumulated post-earnings announcement drift return (θ_1) provides an explanation in which the post-earnings announcement drift in customers is reflected efficiently in the supplier's returns. The interaction term between customer returns and the standardized unexpected earnings (CCAR [2,61] \times SUE) shows that the effect of CCAR [2,61] on the supplier's returns is one time greater for the highest decile of SUE than it is for the lowest decile of SUE.

$$CAR[2, 61] = \alpha + \beta_1 SUE + \theta_1 CCAR[2, 61] + \theta_2 (CCAR[2, 61] \times SUE) + \beta_2 Z + \text{industry effect} + \text{year effect} + \varepsilon \quad (3)$$

The results are reported in Table 4. The coefficients of SUE in all four model specifications are positive and significant at the 1% level, indicating that investors pay limited attention and do not fully incorporate economic links. Hence, the observed cross-firm reaction occurs. The effect of customer earnings surprises is also economically significant. A change in the customer earnings surprises from the lowest decile to the highest decile is associated with an increase in the supplier's delayed returns of approximately 2.4%. The coefficient estimates of CCAR [2,61] in all four model specifications are positive and statistically significant at the 1% level, suggesting that the customer's cumulated post-earnings announcement drift return is reflected efficiently in the supplier's returns. A one-standard-deviation increase in the post-earnings announcement drift in customer returns (equal to 0.159) increases the supplier's delayed returns by approximately 4.0% (models 1 and 2 are 0.159 times 0.276, whereas models 3 and 4 are 0.159 times 0.248 and 0.159 times 0.249, respectively).

To provide additional evidence of a statistical effect of customer earnings surprises (SUE) on suppliers' delayed returns (CAR [2,61]) through the customer post-earnings announcement drift (CCAR [2,61]), I use an instrumental variable two-stage least squares (2SLS) approach. The instruments for CCAR [2,61] are SUE and its interacted terms with other control variables, such as RCANALYSTS, PERCSALE, PERCSIZE, SAMEDAY, MKTRET, and SAMEINDUSTRY. In

the first stage, I separately regress the independent variable CCAR [2,61] on the above instruments, including industry and year fixed effect controls. In the second stage, I re-estimate the regressions in the main analyses by using fitted values of CCAR [2,61] from the first-stage regressions. Table 5 provides the estimates from the second-stage regressions. Consistent with the prior results, the coefficient on the fitted values of CCAR [2,61] is significantly positive at the 5% level. Overall, these results provide evidence that the post-earnings announcement drift in customers contributes to the observed cross-firm reaction, and the predictability of customer earnings surprises for suppliers' future returns is not entirely due to limited investor attention to earnings-related information transfers.

5. Robustness checks

The focus of H_{1a} and H_{1b} is whether investors have limited attention with respect to the information contained in customer earnings announcements for suppliers when the ex ante customer–supplier links between firms are publicly available.

5.1. Supplier returns to customers' earnings news over different horizons

To address the possible effect of different horizons on return sensitivities, I compute supplier stock returns before and after the customer announcement using different horizons.

Table 6

Robustness checks: supplier returns to linked customers' earnings news over different horizons.

Variables	(1) CAR[−10,−1]	(2) CAR[2,31]	(3) CAR[2,46]	(4) CAR[2,61]	(5) CAR[2,76]	(6) CAR[2,91]
SUE	0.295 (0.78)	1.247* (1.92)	1.831** (2.41)	2.637*** (2.99)	2.391** (2.38)	2.193* (1.91)
RCANALYSTS	−0.001 (−0.03)	0.032 (0.78)	0.083* (1.72)	0.085 (1.58)	0.128* (1.95)	0.158** (2.06)
PERCSALE	0.047 (0.28)	0.372 (0.60)	−1.009 (−1.32)	0.498 (1.41)	1.850 (1.47)	2.886** (2.24)
PERCSIZE	0.043 (1.24)	0.045 (0.92)	0.054 (0.90)	0.085 (1.28)	0.166** (2.10)	0.180** (2.00)
SAMEDAY	0.757 (1.02)	1.713 (1.33)	2.366* (1.66)	0.836 (0.50)	1.064 (0.54)	2.968 (1.36)
MKTRET	−0.253 (−1.37)	0.126 (0.38)	0.158 (0.31)	0.252 (0.47)	−0.074 (−0.14)	0.165 (0.27)
SAMEINDUSTRY	0.312 (0.45)	−0.279 (−0.19)	−0.317 (−0.17)	−0.364 (−0.20)	−1.799 (−0.96)	−2.924 (−1.39)
SUE × RCANALYSTS	0.053 (1.08)	0.045 (0.51)	0.043 (0.40)	0.095 (0.78)	−0.001 (−0.01)	−0.037 (−0.24)
SUE × PERCSALE	−0.617** (−1.98)	0.344 (0.40)	3.765*** (3.58)	1.141* (1.71)	−1.494 (−0.68)	−2.513 (−1.12)
SUE × PERCSIZE	−0.036 (−0.81)	−0.039 (−0.43)	−0.055 (−0.52)	−0.068 (−0.60)	−0.188 (−1.63)	−0.213* (−1.67)
SUE × SAMEDAY	−0.552 (−0.46)	−5.981*** (−2.63)	−6.398** (−2.54)	−5.161* (−1.81)	−4.236 (−1.30)	−8.077** (−2.20)
SUE × MKTRET	0.243 (0.78)	0.223 (0.39)	0.095 (0.13)	0.183 (0.23)	0.462 (0.54)	0.101 (0.11)
SUE × SAMEINDUSTRY	0.032 (0.03)	1.337 (0.49)	0.836 (0.26)	0.746 (0.22)	2.470 (0.70)	5.119 (1.29)
N	10,148	10,146	10,143	10,140	10,139	10,136
R ²	0.022	0.016	0.018	0.026	0.026	0.028

Notes: This table presents additional robustness tests of the period preceding the event window, e.g., [−10, −1] and the delayed responses of a supplier, following the customers' announcements, to customers' earnings news. More specifically, it reports supplier's stock price reactions following the customers' announcements over 30-, 45-, 60-, 75-, and 90-trading-day horizons. Independent and control variables are the same as used in model 4 of Table 3. The Appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, industry and year controls are included but are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSALE and PERCSIZE are scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

Table 5

Test of how much the customer post-earnings announcement drift contributes to the cross-firm reaction: an instrumental variable approach.

Variables	(1) CAR[2,61]	(2) CAR[2,61]
Instrument for CCAR [2,61]	0.374** (2.29)	0.363** (2.21)
RCANALYSTS	0.127*** (3.99)	0.127*** (4.01)
PERCSALE	1.375*** (21.61)	1.375*** (21.73)
PERCSIZE	0.058 (1.05)	0.058 (1.04)
SAMEDAY	−1.224 (−1.40)	−1.228 (−1.37)
MKTRET	0.259 (0.95)	0.258 (0.95)
SAMEINDUSTRY		0.041 (0.05)
N	10,137	10,137
R ²	0.026	0.026

Notes: This table estimates the regression of supplier returns (CAR [2,61]) on fitted values of customer returns (CCAR [2,61]) estimated from the first-stage regression of customer returns (CCAR [2,61]) on instrumental variables of customer earnings surprises (SUE) and other control variables interacted with SUE including industry and year fixed effects controls. The Appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, the first-stage regression results are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSALE and PERCSIZE are scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

Table 7

Robustness checks: the importance of the customer to the supplier.

Variables	Firm size		Sales		Analysts coverage	
	Low (1) CAR[2,61]	High (2) CAR[2,61]	Low (3) CAR[2,61]	High (4) CAR[2,61]	Low (5) CAR[2,61]	High (6) CAR[2,61]
SUE	0.720 (0.70)	4.274 [*] (1.93)	2.040 (1.12)	4.607 ^{***} (3.21)	1.577 (0.89)	6.155 ^{***} (2.60)
RCANALYSTS	−0.170 (−1.55)	0.051 (0.67)	0.060 (0.51)	0.055 (0.69)	−0.006 (−0.01)	0.112 [*] (1.71)
PERCSALE	0.301 ^{**} (2.16)	0.019 (1.27)	−3.549 (−0.56)	0.003 (0.64)	1.551 ^{**} (2.19)	−0.037 (−1.59)
PERCSIZE	−0.336 ^{***} (−4.28)	0.093 (1.27)	0.239 (1.21)	0.172 (1.10)	−0.302 (−1.64)	0.077 (1.07)
SAMEDAY	0.060 (0.04)	−0.395 (−0.08)	3.930 (1.05)	3.717 (1.52)	2.414 (1.18)	3.091 (0.75)
MKTRET	−0.133 (−0.18)	0.571 (0.46)	−0.184 (−0.18)	1.198 (1.35)	−0.588 (−0.74)	0.887 (1.01)
SAMEINDUSTRY	2.517 (1.03)	0.531 (0.10)	−3.430 (−1.47)	2.697 (0.79)	0.666 (0.25)	1.429 (0.52)
SUE × RCANALYSTS	0.246 (1.20)	0.160 (0.89)	−0.038 (−0.16)	−0.022 (−0.10)	0.574 (0.29)	0.037 (0.23)
SUE × PERCSALE	−0.253 (−0.62)	0.014 (0.49)	5.629 (0.96)	0.013 (1.40)	−1.627 ^{**} (−1.97)	0.089 ^{**} (2.35)
SUE × PERCSIZE	1.236 ^{***} (5.18)	−0.101 (−0.93)	0.049 (0.10)	0.182 (0.62)	0.764 (1.49)	−0.092 (−0.88)
SUE × SAMEDAY	−0.490 (−0.16)	−11.298 (−1.18)	−6.301 (−0.96)	−11.000 ^{**} (−2.42)	−4.498 (−1.17)	−17.898 ^{**} (−2.29)
SUE × MKTRET	0.069 (0.06)	0.555 (0.28)	0.398 (0.28)	−0.551 (−0.39)	1.077 (0.90)	−0.342 (−0.23)
SUE × SAMEINDUSTRY	−3.732 (−0.87)	−4.945 (−0.44)	2.546 (0.39)	−5.613 (−0.96)	−1.253 (−0.28)	−4.772 (−0.81)
N	3388	3381	3392	3365	3542	3338
R ²	0.031	0.040	0.034	0.044	0.030	0.038

Notes: This table presents the estimation results obtained by regressing the supplier's cumulative abnormal returns following the customer's earnings announcement (CAR [2,61]) on the customer's standardized unexpected earnings (SUE), on several controls, and on the interaction terms between SUE and controls. The subsamples are based on the tertiles (low, medium, and high) of firm size of the customer relative to that of the supplier in columns 1 (low) and 2 (high), the percent of supplier revenues from the given customer in columns 3 (low) and 4 (high), and analyst coverage of the customer relative to that of the supplier in columns 5 (low) and 6 (high). The appendix outlines the definitions and data sources for the regression variables. For the sake of brevity, the industry and year controls are included but are not tabulated. The industry controls are based on Fama and French's (1997) 10-industry classification. PERCSIZE is scaled by a factor of 1/100 and returns are in percent. The *t*-statistics based on White standard errors corrected for clustering by supplier firms are reported in parentheses.

*** Indicates statistical significance at the 0.01 level.

** Indicates statistical significance at the 0.05 level.

* Indicates statistical significance at the 0.10 level.

Table 6 presents the estimation results for the period preceding the customer announcement, e.g., [−10, −1] and the delayed responses of a supplier following the customer announcement over 30-, 45-, 60-, 75-, and 90-trading-day horizons. I find that the coefficient of SUE in column 1 is statistically insignificant, suggesting that the earnings surprise has not been anticipated for the period preceding the customer announcement, such as CAR [−10, −1]. I also find that when using these contrasting horizons after the customer announcement, the results are quite similar. The coefficients of SUE in columns 2–6 are all positive and statistically significant at the 10% level, confirming that the cumulative abnormal returns of a supplier following customer announcements are positively related to customers' earnings news. I therefore conclude that the delayed returns over different horizons are not likely to affect the results.

5.2. The importance of the customer to the supplier

To assess how my previous inferences change depending on the importance of the customer to the supplier, I repeat the main analyses using alternative sample selections based on the tertiles of the ratio of the customer's firm size and analyst coverage relative to those of the supplier, and the percent of supplier revenues from the linked customer.

Table 7 presents the estimation results for the sensitivity to the importance of the customer to the supplier as a contrast to model 4 in Table 3. The subsamples are based on the tertiles (Low, Medium,

and High) of the ratio of the customer's market value to the supplier's market value in columns 1 (low) and 2 (high), the percent of supplier revenues from the linked customer in columns 3 (low) and 4 (high), and the ratio of analyst coverage of the customer to that of the supplier in columns 5 (low) and 6 (high). The coefficient of SUE in column 1 is insignificant, whereas for model 2, it is positive and significant at the 10% level, suggesting that higher market value of the customer relative to that of the supplier plays a more important role with respect to the predictive power of customer earnings surprises on supplier returns. The coefficient of SUE in column 3 is insignificant, and the coefficient of SUE in column 4 is positive and significant at the 1% level with a slightly larger magnitude than the coefficient of SUE in column 3. This result implies that the larger the percent of the supplier's sales going to the linked customer, the greater the predictive power of the linked customer earnings surprises on supplier returns. The coefficient of SUE in column 5 is also insignificant, whereas it is positive and significant at the 1% level in column 6, suggesting that the more attention the customer receives from analysts relative to the supplier, the larger the supplier's delayed reaction to customer earnings surprises. This evidence further supports the limited investor attention to economic links hypothesis (Cohen & Frazzini, 2008). Overall, these results are consistent with the evidence in Table 3 and further address the importance of the customer to the supplier in determining the predictive power of customer earnings surprises on supplier returns.

5.3. Different approaches for standardizing unexpected earnings

The standardized unexpected earnings (SUE) used in the main analyses are based on scaled-decile ranks. As a robustness check, I re-estimate all model specifications with the unexpected earnings (CUE) replacing SUE everywhere in Tables 2 and 3, including CBNEWS and the CBNEWS interaction with CUE. The inferences are unchanged, and the results are not reported for brevity.¹²

The unexpected earnings measure used in the main analyses is normalized by the stock price at the end of the corresponding quarter. I also test the robustness of the results with different measures of earnings surprises following Datta and Dhillon (1993) and Prokopczuk (2010). In particular, I normalize the difference between the actual earnings per share and the median of the individual analyst forecasts with the absolute value of the realized earnings per share and the cross-sectional standard deviation of earnings forecasts, respectively. I rank the normalized earnings surprises into ten deciles based on the sample distribution of customer earnings surprises by quarter in each industry and then scale them between 0 and 1 (Bartov et al., 2000; Bernard & Thomas, 1990; Hirshleifer et al., 2009; Zhang, 2008). Based on the above two alternative measures of standardized unexpected earnings, I re-estimate all regression specifications in Tables 2 and 3. The inferences are unchanged, and the results are not reported for brevity.

Overall, these results provide evidence that customer earnings announcements convey information for suppliers and thus provide further support for the notion that investors are inattentive to customer–supplier information transfers.

6. Concluding remarks

The limited investor attention hypothesis proposes that limited investor attention to the firm-specific information of economically linked firms (Cohen & Frazzini, 2008), a large number of same-day earnings announcements by other firms (Hirshleifer et al., 2009), Friday earnings announcements (Dellavigna & Pollet, 2009), and stock recommendations (Loh, 2010) cause market underreactions to new information, generating predictable returns across firms.

This study investigates whether limited investor attention to linked customers' earnings announcements leads to market underreactions. I show that the cumulative abnormal stock returns of a supplier surrounding and following its linked customers' earnings announcement date are positively related to customers' earnings news, which suggests that earnings announcements by economically linked customers contain important information for suppliers.

In a scheme in which customer earnings surprises lead to customer returns (e.g., Bernard & Thomas, 1989) and the latter, in turn, generate supplier returns (Cohen & Frazzini, 2008), I find that the

post-earnings announcement drift in customers contributes to the observed cross-firm reaction, and the predictability of customer earnings surprises for suppliers' future returns is not entirely due to limited investor attention to earnings-related information transfers.

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Appendix

Description of the variables.

Variables	Description and source
Panel A: Cumulative abnormal returns	
CAR[−1,1]	Supplier's three-trading-day cumulative abnormal returns around the customer's earnings announcement. Source: author's calculations based on Compustat segment, CRSP, and IBES.
CAR[2,61]	Supplier's subsequent 60-trading-day cumulative abnormal returns after the customer's earnings announcement. Source: author's calculations based on Compustat segment, CRSP, and IBES.
CCAR[2,61]	Customer's subsequent 60-trading-day cumulative abnormal returns after the customer's earnings announcement. Source: author's calculations based on CRSP and IBES.
Panel B: Unexpected earnings	
CUE	Customer's unexpected earnings is defined as the actual earnings per share subtracted from the median of individual analyst forecasts scaled by three approaches: (1) the end of the quarter share price, (2) the absolute value of realized earning per share, or (3) the cross-sectional standard deviation of individual analyst forecasts. Source: author's calculations based on IBES and CRSP.
SUE	Customer's standardized unexpected earnings is obtained by ranking CUE into ten deciles based on the sample distribution of CUE by quarter in each industry and then scaling them between 0 and 1. Source: author's calculations based on IBES and CRSP.
Panel C: Other control variables	
CBNEWS	Indicator variable that equals 1 if the customer's unexpected earnings are negative and 0 otherwise. Source: author's calculations based on IBES.
CANALYSTS	The number of analysts following the customer. Source: author's calculations based on IBES.
CSALE	The dollar amount of sales of the supplier to a particular customer. Source: Compustat segment.
CSIZE	Customer market capitalization, which is price times the number of shares outstanding at the end of the fiscal quarter. Source: author's calculations based on CRSP.
FANALYSTS	The number of analysts following the supplier. Source: author's calculations based on IBES.
FSALE	The total amount of sales yielded by a supplier. Source: Compustat segment.
FSIZE	Supplier market capitalization, which is price times the number of shares outstanding at the end of the fiscal quarter. Source: author's calculations based on CRSP.
MKTRET	Market returns on the S&P 500 Index surrounding the customers' earnings announcement date. Source: CRSP.
PERCSALE	The percent of supplier revenues from the given customer. Source: author's calculations based on Compustat segment.
PERCSIZE	The ratio of market capitalization of linked customers to suppliers. Source: author's calculations based on CRSP.

¹² In an unreported table, as a contrast to the model 4 in Table 2, the coefficients of CUE and CBNEWS are all positive and statistically significant with magnitudes of 0.732 and 0.370, respectively. However, the coefficient on the interaction terms (CUE × CBNEWS) is insignificant. Thus, there is no difference in the supplier's contemporaneous reaction to CUE based on the sign of the news. As a contrast to the model 4 in Table 3, the coefficients of CUE and CBNEWS are all positive and statistically significant with magnitudes of 6.665 and 1.316, respectively. But the coefficient of the interaction term (CUE × CBNEWS) is negative and statistically significant. The sum of the coefficients on CUE and (CUE × CBNEWS) is still negative with a magnitude of −2.709. Because the measure of CBNEWS is a binary variable for when customer earnings news is negative, the coefficients on CUE should reflect the reaction of supplier returns to positive customer earnings surprises (good news) only, and the sum of the coefficients on CUE and the interaction term (CUE × CBNEWS) should reflect the reaction of supplier returns to negative customer earnings surprises (bad news). Thus, the result suggests that while the supplier's delayed reaction to positive customer news is positive and significant, the supplier's delayed reaction to negative customer news is less pronounced.

Variables	Description and source
RCANALYSTS	The ratio of the number of analysts following the customer to the number of analysts following the supplier. <i>Source: author's calculations based on IBES.</i>
SAMEDAY	Indicator variable that equals 1 if both the supplier and its customers release their earnings on the same day and that equals 0 otherwise. <i>Source: author's calculations based on IBES.</i>
SAMEINDUSTRY	Indicator variable that equals 1 if both the supplier and its linked customers are in the same industry and that equals 0 otherwise. <i>Source: author's calculations based on Compustat segment and Fama and French's (1997) 10-industry classification.</i>

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