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Abstract

We show that the post earnings announcement drift (PEAD) is stronger for conglomerates than single-segment firms. Conglomerates, on average, are larger than single segment firms, so it is unlikely that limits-to-arbitrage drive the difference in PEAD. Rather, we hypothesize that market participants find it more costly and difficult to understand firm-specific earnings information regarding conglomerates which slows information processing about them. In support of our hypothesis, we find that, compared to single-segment firms with similar firm-characteristics, conglomerates have lower institutional ownership, lower short interest, are covered by fewer analysts, these analysts have less industry expertise and also make larger forecast errors. Finally, we find that an increase in firm complexity leads to larger PEAD and document that more complicated conglomerates have greater post-earnings announcement drifts. Our results are robust to a long list of alternative explanations of PEAD as well as alternative measures of firm complexity.

JEL Classifications: G11, G12, G14, G32, G33, M4, L14, D82

Keywords: post-earnings-announcement-drift, conglomerates, complicated firms, business complexity.

1. INTRODUCTION

In this paper, we examine the relation between business complexity (organizational form) and price formation, by contrasting equity return reactions around earnings announcements for conglomerates and single-segment firms. We attempt to answer the following three main questions: (i) Is it more difficult to understand firm-specific earnings information regarding conglomerates, (ii) if so, what are the channels through which conglomeration increases earnings-related informational frictions, and (iii) how business complexity (organizational structure) differs from other proxies of firm-complexity, in particular from those relating to disclosure complexity. In doing so, it is not our purpose to pinpoint whether business complexity leads to mispricing because it introduces informational frictions or because investors' limited-attention prevents them from fully incorporating the information contained in disaggregated financial statements into prices. Rather, we believe the answer is a combination of the two and that both of these hypotheses ultimately are tied to the question of whether business complexity impedes information processing about the firm.

First, using organizational structure as our proxy for business complexity, we find that firms with more complicated organizational structures (conglomerates) have larger post-earnings announcement drifts compared to simpler firms (single-segment firms). Specifically, we find that conglomerates have post-earnings announcement drifts (PEAD's) that are twice as large as single-segment firms. Our findings are not explained by traditional limits-to-arbitrage arguments (Bartov, Radhakrishnan and Krinsky 2000; Mendenhall 2004; Ng, Rusticus, and Verdi 2008; Sadka 2006) as conglomerates on average are significantly larger than single-segment firms. Rather, we attribute our findings to the fact that it is more costly and difficult to understand firm-specific earnings information regarding complicated firms and that information processing takes more time for complex firms, leading conglomerates to underreact to earnings surprises significantly more than single-segment firms. In line with this argument, we show that sophisticated market participants including analysts, institutional investors and short-sellers find it more difficult to understand conglomerates with respect to single-segment firms. We document that, compared to single-segment firms with similar firm-characteristics, conglomerates have lower institutional ownership, lower short interest, are covered by fewer analysts, these analysts have less industry expertise and they also make larger forecast errors. Our results would support the limited attention hypothesis of Hirshleifer and Teoh (2003)[1,2].

Second, we investigate the reason for the larger PEAD for conglomerates. The larger drift for conglomerates could be attributable to either (i) more news released per unit of unexpected surprise earnings (SUE) for conglomerates than single-segment firms or to (ii) under-reaction by investors to conglomerates. In an effort to understand the source of the difference in PEAD, we contrast the immediate as well as the delayed responses of single-segment firms and conglomerates for a hedge portfolio that is long the largest unexpected surprise earnings (SUE) decile and short the smallest SUE decile. Our analysis indicates that single-segment firms and conglomerates have similar hedge returns in the three days around earnings announcements. This finding makes it unlikely that there is more news released by conglomerates with respect to single-segment firms for the same level of earnings surprise. Instead, our analysis suggests that conglomerates under-react to earnings announcements when compared to single-segment firms. Following Dellavigna and Pollet (2009), we define delayed response ratio as the share of the total stock response to announcements that occurs with delay. We find that the delayed response ratio for conglomerates is 42.4%, which is 11.4% more than it is for single-segment firms' 31%. Our analysis lends further support to the interpretation that investors have more difficulty processing earnings related information regarding conglomerates and that information processing takes more time for complex firms. The same results can also be interpreted as evidence of the limited attention paid to more complicated firms by investors.

Third, in an effort to understand if investors really have difficulty interpreting information related to more complicated firms we focus on periods during which firm complexity increases. If the level of firm complexity (conglomerate status) is related to a certain unknown variable that also drives PEAD, then new conglomerates would likely have little exposure to this variable and one

[1] Our results could also be interpreted to be in line with Merton's (1987) hypothesis about information costs as well as Hong and Stein's (1999) arguments about trend-chasers versus news-watchers.

[2] Although it is not our focus, we also find that conglomerates have lower segment disclosure quality than single segment firms introducing additional frictions in the processing of firm level information regarding conglomerates compared to single-segment firms. We proxy for segment disclosure quality using the segment reporting index first proposed by Franco, Urcan and Vasvari (2015). Segment reporting index (rindex) is measured as the firm's average industry-adjusted (at 2-digit SIC code levels) percentage of segment items reported at the end of the fiscal year. For a single-segment firm segment disclosure quality is calculated simply as the percentage of company financial items reported at the end of the fiscal year.

would expect new conglomerates to have low levels of PEAD. Under our hypothesis, however, investors should have the greatest confusion when interpreting earnings announcements of new conglomerates, due to the significant and recent change to their complexity level. We find that an increase in firm complexity, defined either as an increase in the number of segments or as the change in the conglomerate status, leads to higher PEAD. In particular, we find that PEAD for new conglomerates is double that of existing conglomerates and more than four times that of single-segment firms. Furthermore, we find that the stronger average PEAD for firms that have recently become conglomerates, or have added new business segments, is attributable primarily to firms that have created a new line of business from within, without merging with another firm from a different industry.

Finally, we investigate whether the degree of complexity matters in the cross-section of conglomerate PEAD returns. In doing so we utilize the dispersion in segment earnings growth rates, HTSD[3], as our proxy for firm complexity. Hirshleifer and Teoh (2003) propose that as long as a sub-section of investors use the firm's aggregate earnings growth rate, instead of individual segment growth rates, to extrapolate the future value of the firm the firm will be mispriced. They suggest and theoretically show that higher dispersion in segment earnings growth rates with respect to the firm's aggregate growth rate will lead to higher information processing costs, which will limit investor attention and eventually lead to higher mispricing for the firm. Hirshleifer and Teoh (2003) interpret HTSD as a measure of investor inattention. We find, in line with theory, that conglomerates with high dispersion in their segments' growth rates have larger post-earnings announcement drifts. This finding suggests that higher degree of complexity among conglomerates leads to higher level of PEAD and further supports the notion that higher business complexity limits investors' attention by reducing their ability to interpret publicly available but hard-to-process information.

Our results are robust to alternative explanations of PEAD such as potential spillover from the predictability documented in Cohen and Lou (2012), the impact of analyst responsiveness (Zhang

[3] HTSD, Hirshleifer-Teoh Segment earnings growth Dispersion measure, is a proxy for limited attention proposed by Hirshleifer and Teoh (2003). In order to calculate HTSD, first we compute the deviation of each segment's earnings growth rate from the firm's aggregate earnings growth rate and square it. Then, we value weight all segment deviation squared values by the amount of sales generated by that segment as a fraction of the total sales of the firm. Finally, we add up all the squared segment deviation values weighed by corresponding sales share values to calculate HTSD.

2008), the impact of ex-ante earnings volatility on earnings persistence (Cao and Narayanamoorthy 2012), the time-varying nature of earnings persistence (Chen 2013), as well as the impact of disclosure complexity (Miller 2010, You and Zhang 2009, Feldman, Govindaraj, Livnat, and Segal 2010, Lehavy, Li and Merkley 2011, Lee 2012)[4]. Furthermore, we find no evidence that conglomerates are more likely to choose Fridays (Dellavigna and Pollet 2009) or days with more competing news (Hirshleifer, Lim and Teoh 2009) to announce their earnings.

Our study contributes to three strands of literature. First, we add to the literature on the determinants of the post-earnings announcement drift (PEAD). We show that business complexity induces significant informational frictions that make it more difficult to understand earnings related information regarding complex firms. This, in turn limits investor attention leading to larger PEAD. Specifically, we find that conglomerates have post-earnings announcement drifts that are twice as large as single-segment firms and that conglomerates' delayed response ratio is 11.4% higher than that of single-segment firms. Second, we complement the literature that studies how business complexity can complicate information processing for sophisticated market participants. Specifically, we document that, compared to single-segment firms with similar firm-characteristics, conglomerates have lower institutional ownership, lower short interest, are covered by fewer analysts, these analysts have less industry expertise and they also make larger forecast errors. Third, we expand on the literature that studies firm complexity by showing that the impact of business complexity on PEAD is a distinct phenomenon from the one documented in Cohen and Lou (2012) as well as being robust to alternative explanations of PEAD. The findings should be of interest to researchers, analysts and investors interested in the impact of business complexity on market efficiency.

The rest of the paper is organized as follows. Section 2 presents hypothesis development. Section 3 describes our measure of business complexity and other data utilized in this study, and provides descriptive statistics. Section 4 provides our main results. Section 5 provides a comprehensive list of robustness tests. Section 6 concludes.

[4] We investigate whether alternative explanations of PEAD, which could be tied to other dimensions of firm-complexity, can explain our results explicitly in Tables 7 and 8.

2. HYPOTHESIS DEVELOPMENT AND LITERATURE REVIEW

Prior research has demonstrated the role that corporate focus (conglomeration) can play in improving (deteriorating) a firm's information environment. The literature has shown that focus-increasing spin-offs, equity carve-outs, and targeted stock offerings lead to a significant increase in coverage by analysts that specialize in subsidiary firms' industries as well as an improvement in analyst forecast accuracy for parent and subsidiary firms.

Gilson, Healy, Noe, and Palepu (2001) attribute the improvement in analyst forecast accuracy in part to increased disclosure as all analysts gain access to disaggregated data for the parent and subsidiary firms after the breakup. Furthermore, they find that there is significant incremental improvement in forecast accuracy for specialists relative to non-specialists suggesting that focus-increasing restructurings may reduce analysts' task complexity (Clement 1999) and may also lead to better facilitation of information transfers by analysts with industry expertise (Hilary and Shen 2013). In a related paper, Chemmanur and Liu (2011) theoretically show that focus-increasing restructurings lead to higher information production by institutional investors. They attribute the increase in information production to two reasons. First, division of consolidated firms into less complex units with their own financial reports reduces outside investors' information production costs. Second, focus-increasing restructurings allow institutional investors to concentrate their investment in those parts of the conglomerate about which they have expertise.

Hirshleifer and Teoh (2003) suggest that even if disaggregation can improve information processing about complicated firms, better disclosure will not necessarily fully eliminate the mispricing of complicated firms. More specifically, Hirshleifer and Teoh (2003) theoretically show that as long as a non-negligible percentage of the investing public uses firm-level earnings growth rates rather than utilizing individual segment earnings growth rates to project the future value of conglomerates, more complicated firms will face larger mispricing. In a related paper, Cohen and Lou (2012) find that conglomerates take longer to incorporate industrywide shocks into their prices compared to single-segment firms. In particular, Cohen and Lou find that pseudo-conglomerate returns predict the returns to actual conglomerates one month ahead, which indicates that conglomerates take an extra month to incorporate industrywide shocks into their prices[5]. Results in Cohen and Lou (2012) could be attributable either to the fact that conglomeration introduces additional frictions to information processing or simply to the limited-attention hypothesis proposed by Hirshleifer and Teoh (2003), or a combination of the two[6].

To the best of our knowledge, there is no empirical research on the relation between business complexity (organizational structure) and the post-earnings announcement drift (PEAD). The closest studies focus on the relation between PEAD and alternative measures of firm-complexity especially those related to disclosure complexity. Miller (2010) shows that disclosure complexity reduces trading volume, especially among retail investors. You and Zhang (2009) find that higher disclosure complexity, estimated via the length of 10-K's, leads to greater market under-reaction to 10-K filings coupled with a 10-K announcement drift that lasts over a year. Feldman, Govindaraj, Livnat, and Segal (2010), using the tone change in the management discussion and analysis section of 10-Qs and 10-Ks as an alternative measure of disclosure complexity, show that investors under-react to such complicated disclosures leading to significant equity return drifts following the filing of a 10-Q or a 10-K. Lehavy, Li and Merkley (2011) further add to this literature by showing that higher disclosure complexity, also measured via textual complexity, leads to greater analyst forecast dispersion and lower forecast accuracy.

A recent working paper by Bushee, Gow and Taylor (2015) challenges the results of studies that utilize textual analysis for measuring firm complexity and suggests that the literature on disclosure complexity may require a significant overhaul. Bushee et al. (2015) propose that relying on disclosure (language) complexity to proxy for business complexity may be misleading as while complex language could be used to genuinely convey information about complicated businesses it can also be used to obfuscate. They disentangle the components of linguistic complexity related to

[5] For each conglomerate firm, a pseudo-conglomerate consists of a portfolio of the conglomerate firm's segments made up using only stand-alone firms from the respective industries. For each portfolio that corresponds to a specific segment of the conglomerate firm an equal-weighted return is calculated. Returns corresponding to each segment are then value-weighted according to that segment's contribution to the conglomerate firm's total revenues in order to calculate a corresponding pseudo conglomerate return.

[6] It is in fact extremely difficult to distinguish between these two hypotheses as they are intimately related. As pointed out by Hirshleifer and Teoh (2003), focusing one's attention on one area would lead to opportunity costs in others. Hence, what we interpret as hard-to-process information in many cases may in fact be a reflection of the limited-attention paid to that particular information by market participants if in fact difficulty of information processing in one area introduces significant opportunity costs in other areas.

obfuscation from the provision of information by comparing the linguistic complexity of managers to that of analysts. Bushee et al. (2015) show that when managers' linguistic complexity is similar to that of analysts, language complexity reveals the true economic complexity of the firm, but when the managers' linguistic complexity is unrelated to that of analysts, managers simply use complex language to obfuscate. Bushee et al. (2015) results would suggest that approximating for business complexity via disclosure complexity may not be the most direct or even most appropriate choice. To the extent that disclosure complexity is a noisy manifestation of underlying business complexity, it might be more prudent to use a significantly more direct measure of the firm's business complexity by analyzing organizational structure[7].

The results in Miller (2010), You and Zhang (2009), Feldman, Govindaraj, Livnat, and Segal (2010) as well as Lehavy, Li and Merkley (2011) would suggest that disclosure complexity introduces informational frictions. Nevertheless, none of these studies particularly study the marginal impact of disclosure complexity on PEAD. The only exception that comes close to analyzing the association of disclosure complexity with PEAD is Lee (2012). Lee (2012) finds that, for the same level of earnings surprise, investors first underreact and then respond in the direction of the surprise with a delay to 10-Q filings if a given 10-Q is textually more complicated[8]. However, since 10-Q's are filed at a date later than the actual earnings announcements, Lee (2012) is not a direct investigation of the impact of disclosure (firm) complexity on PEAD but rather an analysis of how earnings related information and disclosure complexity co-influence investor reaction to 10-Q filings. Given the results of Bushee et al. (2015), it is not clear whether Lee (2012) captures the impact of business complexity on post-10-Q filing drift or the impact of managerial obfuscation. In fact, Lee (2012) suggests that her results are a lot more in line with a managerial obfuscation explanation. Furthermore, there is no investigation in Lee (2012) if the total 10-Q filing response, the negative immediate return reaction plus the positive return drift, leads to a net

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[7] We thank Stan Markov for his specific recommendation to highlight the fact that disclosure complexity is a noisy proxy for the complexity of the underlying business.

[8] Lee (2012) examines two dimensions of readability: (a) the length of quarterly reports as measured by the number of words contained in the 10-Q filing (LENGTH) and (b) the textual complexity of quarterly reports as measured by the Fog index (FOG). Lee's (2012) proxy for difficult-to-read disclosures is unexpected readability, measured as the unexpected LENGTH and FOG. She calculates the unexpected LENGTH and FOG components by subtracting the expected length and Fog index from the raw length and Fog index respectively, where the expected length and Fog index are measured by the length and Fog index of the immediate preceding 10-Q filing.

increase or decrease on PEAD[9] making it impossible to infer any conclusions regarding the impact of disclosure complexity on PEAD.

This paper's focus is to analyze how the underlying complexity of the firm's business affects information processing about the firm around its earnings announcements. Given that disclosure complexity is at best a noisy approximate for business complexity and worse yet may not be related to it at all, we propose using organizational form as a direct measure of the complicatedness of the firm's underlying business.

We first hypothesize that the more complicated the organizational form the more costly and difficult it is for market participants to understand firm-specific information. We get our inspiration for the first hypothesis from the established literature that studies the impact of focus-increasing restructurings on the information environment of the firm. We contend that analysts, institutional investors and short sellers find information processing about conglomerates more difficult and costly compared to single-segment firms with comparable firm characteristics. This occurs because first, it is much more costly to analyze information about consolidated firms as information about different business lines is not disaggregated; and second, it is not common for institutional investors, analysts and short-sellers to possess expertise about all parts of a conglomerate (Clement 1999; Gilson, Healy, Noe, and Palepu 2001; Chemmanur and Liu 2011; Hilary and Shen 2013). We test the validity of the first assumption by comparing analyst coverage, forecast dispersion, forecast errors; institutional ownership, turnover and short-selling activity for conglomerates and single-segment firms with similar firm-characteristics.

Next, we hypothesize that conglomerates have larger PEAD compared to single-segment firms. Since conglomerates are more costly and difficult to understand, per our first hypothesis, this should naturally lead to slower information processing around their earnings announcements.

Third, we hypothesize that the second hypothesis is not attributable to conglomerates releasing more news per unit of SUE but rather due to a genuine difficulty of processing firm-specific earnings information regarding conglomerates. We test the validity of the third hypothesis by contrasting the immediate return reactions and delayed response ratios for single-segment firms and

[9] We analyze the direct impact of disclosure complexity on PEAD. To our surprise, we find that the interaction of surprise unexpected earnings (SUE) with firm-level textual complexity (FOG) predicts PEAD with a negative sign when we control for the impact of organizational structure on PEAD. This result would suggest that disclosure (textual) complexity may not be the best proxy for business complexity.

conglomerates for a hedge strategy that goes long on the largest SUE decile and short on the smallest SUE decile.

Fourth, we hypothesize that the degree of complexity matters. We support our fourth hypothesis by showing that an increase in firm complexity leads to higher PEAD and by documenting that more complicated conglomerates have larger PEADs than less complicated conglomerates. Finally, we contend that the effect we study is distinctly different from results in Cohen and Lou (2012) who investigate how industry-wide news gets incorporated into the prices of single-segment firms and conglomerates. To distinguish the impact of business complexity on returns attributable to firm-specific news from the impact of business complexity on returns attributable to industry-wide news we specifically control for potential spillover from the predictability documented in Cohen and Lou (2012) in our PEAD analyses.

In an attempt to establish the uniqueness of our results we need to control for alternative explanations for PEAD other than disclosure complexity. In a recent paper Cao and Narayanamoorthy (2012) document that post-earnings announcement drift (PEAD) is a function of both the magnitude of an earnings surprise (SUE) and its persistence. Cao and Narayanamoorthy (2012) show that, contrary to the expectations of the market, firms with higher (lower) earnings volatility have lower (higher) earnings surprise (SUE) persistence and document that PEAD returns due to earnings volatility are concentrated in firms with the smallest trading frictions, i.e. those firms that have the lowest ex-ante earnings volatility. Since conglomerates, on average, have smaller trading frictions than single-segment firms we control for the impact of ex-ante earnings volatility (EarnVol) on PEAD and document that our results are virtually unchanged and as such are distinct from the impact of ex-ante earnings volatility on PEAD studied in Cao and Narayanamoorthy (2012).

In another paper, that investigates the impact of information complexity on PEAD, Chen (2013) documents that investors have difficulty understanding the time-varying nature of earnings persistence and their failure to incorporate this characteristic into the accounting and economic fundamentals leads to the post-earnings announcement drift. If there is a systematic difference in the time-varying nature of earnings persistence between single-segment firms and conglomerates, then such a difference could explain our findings. We find that controlling for the impact of time-varying earnings persistence (EP) documented in Chen (2013) slightly reduces the coefficient on the interaction of SUE with the conglomerate dummy but our main results are largely unchanged suggesting that the impact of business complexity, measured via organizational structure, on PEAD is distinct from the impact of time-varying earnings persistence on PEAD.

Finally, we investigate whether varying analyst responsiveness for conglomerates and single-segment firms could explain our results. Following Zhang (2008), we construct a measure of analyst responsiveness (DRESP) and investigate whether its interaction with SUE could reduce the economic and statistical impact of business complexity on PEAD. Our results suggest that impact of DRESP on PEAD can't explain our main findings, either.

3. DATA

We use three measures of firm complexity[10]. The first measure, Conglo, is the conglomerate dummy, equal to 1 if the firm is a conglomerate and 0 otherwise. The firm is deemed to be a conglomerate if it has business divisions in two or more different industries, according to Compustat segment files. Industries are defined using two-digit SIC codes. The second measure of complexity, NSeg, is the number of divisions with different two-digit SIC codes. The third measure, Complexity, is a continuous variable based on sales concentration. Complexity equals 1-HHI, where HHI is the sum of sales shares of each division squared, HHI= $\sum_{i=1}^{N} s_i^2$, where sales share, si, for each division is the fraction of total sales generated by that division. According to the third definition of complexity, a firm with sales in a single segment would have a Complexity measure of 0, whereas a firm with sales in a large number of industries could achieve a Complexity score close to 1.

Our measure of PEAD is the slope from the Fama-MacBeth (1973) regression of cumulative post-announcement returns on earnings surprises. Post-announcement cumulative abnormal returns (CARs) are cumulated between trading day 2 and trading day 60 after the earnings announcement. CARs are size and book-to-market adjusted following Daniel et al. (1997) (also known as DGTW). Earnings announcement dates are from COMPUSTAT, and daily returns are from CRSP daily files. We measure earnings surprise as standardized unexpected earnings (SUE), defined as the difference between earnings per share in the current quarter and earnings per share in the same quarter of the

[10] Hirshleifer and Teoh (2003) define dispersion in segment earnings growth rates, HTSD, as a measure of inattention. We interpret HTSD as both a measure of limited attention and firm complexity. Since we utilize HTSD only in Table 7 we don't introduce it as a measure of complexity in this section.

previous year, scaled by the share price for the current quarter[11]. Since we calculate SUE and PEAD values as in Livnat and Mendenhall (2006) we use the same sample selection criteria. In doing so, we restrict the sample to firm-quarter observations with price per share greater than $1 as of the end of quarter t in an effort to reduce noise caused by small SUE deflators. We also keep only those observations with non-negative book value of equity at the end of quarter t-1, while excluding those observations with market value of equity less than $5 million at the end of quarter t-1.

Our sample period is determined by the availability of the segment data and lasts from January 1977 to December 2010. All other variables are defined in the Data Appendix.

3.1 Descriptive Statistics, Organizational Structure and Limits to Arbitrage

Complex firms tend to be larger, more liquid, less volatile, and more transparent and as such they are expected to have lower limits to arbitrage. In this section, we empirically verify the relationship between firm complexity and the traditional measures of limits to arbitrage.

Panel A of Table 1 reports the full distribution of SUE, Complexity=1-HHI, and number of segments for all firms and for conglomerates only. A few numbers are particularly noteworthy. First, it is important to note that SUE changes by 0.139 (0.064 minus -0.075) between the 95th and the 5th percentiles and by 0.274 (0.129 minus -0.145) between the 97.5th and the 2.5th SUE percentiles. This would suggest that the spread in CARs between firms with SUEs in the 97.5th and the 2.5th percentiles will be roughly double that of the spread in CARs between firms with SUEs in the 95th and the 5th percentiles. Second, we notice that most firms in our sample are not conglomerates (the median number of segments in the full sample is 1) and most conglomerates have two segments (the median number of segments for conglomerates is 2 except for a few years early in the sample)[12]. A relatively large number of conglomerates report three segments and some have four segments, whereas conglomerates with five or more segments make up less than 2.5% of the sample. Third, the distribution of complexity suggests that there are a significant number of low-complexity firms. For example, a two-segment firm where one segment accounts for 95% of

[11] Using alternative specifications of SUE, such as calculating SUE as the deviation from consensus analyst forecasts, yields results that are qualitatively and quantitatively similar.

[12] In untabulated results, we find that 27% of firms in the sample are conglomerates. This number varies from 47% in the late 1970s to 17% in the late 1990s back to 25% in the 2000s.

the revenues would have a complexity measure of 0.095. This level of complexity is comparable to the 10th complexity percentile in our sample which is only 0.079. A two-segment firm where one segment accounts for 90% of sales has the complexity measure of 0.18. This level of complexity is comparable to the 25th complexity percentile among conglomerates. These observations suggest that even small segments are reported in Compustat, and that we are not lumping together single-segment firms with conglomerates that have a lot of small segments.

The rest of Table 1 compares the firm characteristics of single-segment firms and multi-segment firms (conglomerates). Multi-segment firms are firms that have business segments with more than one two-digit SIC code, according to Compustat segment files. Single-segment firms are those firms that are classified in Compustat segment files and operate in a single industry. "All Compustat firms" in the table refers to the aggregation of single-segment and multi-segment firms with non-missing quarterly earnings[13].

In Panel B, we summarize earnings surprises (SUE) and announcement returns (CAR(1;+1)) for the three types of firms specified as above. CAR(-1;+1) is size and book-to-market adjusted as in DGTW. Panel B1 reports the mean CAR values, in an attempt to assess whether conglomerates, on average, have more positive earnings surprises, and Panel B2 reports the means of absolute values of CAR(-1;+1), testing whether earnings surprises experienced by conglomerates are different in magnitude.

We find in Panel B that conglomerates experience earnings surprises that are significantly smaller in magnitude than the earnings surprises experienced by single-segment firms. Panel B1 reveals that SUEs and announcement CARs of the two firm groups (single-segment and multi segment) are, on average, positive at 15.6 bp and 15.5 bp, respectively, and that conglomerates have somewhat more positive SUEs, but the difference is never statistically significant.

Panel B2 shows that the magnitude of the announcement CARs is significantly smaller for conglomerates than it is for single-segment firms, whereas the average absolute magnitude of SUE is similar for both groups of firms.

Panel C summarizes the median values of several liquidity measures for single-segment firms, and multi-segment firms. The first three - the Gibbs measure (Hasbrouck, 2009), the Roll (1984) measure, and the effective spread estimate of Corwin and Schultz (2012) estimate the effective bid-

[13] The number of firms in quarterly Compustat files is larger than the number of firms reported in Compustat segment files, because single-segment firms and firms with relatively small segments do not have to report segment data.

ask spread. We find that the bid-ask spread of a representative conglomerate is roughly one-third to two-thirds lower than the bid-ask spread of a representative single-segment firm. The fourth liquidity measure, the Amihud (2002) measure, estimates the price impact and shows that conglomerates experience 50% less price impact when compared to a representative single-segment firm. The last measure is a catch-all trading cost measure from Lesmond et al. (1999). This measure calculates the fraction of zero-return days in each firm-year and assumes that stocks are not traded when the trading costs are higher than the expected profit from trading. Thus, a greater fraction of zero-return days is synonymous with higher trading costs. We find that for conglomerates the median number of zero-return days is 11.8%, as opposed to 14.1% for single-segment firms and that the difference is statistically significant.

In summary, all liquidity measures in Panel C strongly suggest that conglomerates are significantly more liquid than single-segment firms. Thus, the liquidity measures suggest that if the link between PEAD and complexity were driven by liquidity effects, then PEAD would be stronger for simpler firms, contrary to our hypothesis. This observation also suggests that, controlling for the interaction between PEAD and liquidity would make the relation between PEAD and complexity economically even more significant.

We conclude, given the fact that on average conglomerates are larger and more liquid, that they should have significantly lower limits to arbitrage.

4. RESULTS

4.1 Information Production for Conglomerates and similar Simple firms

Our analysis in Table 1 clearly demonstrates that conglomerates have lower limits to arbitrage. Nevertheless, relying on the extant literatures on focus-increasing corporate restructuring events and the impact of analyst and investor expertise on information production we hypothesize that information about conglomerates could be harder to process. Difficulty of processing information regarding conglomerates, in turn, can discourage analysts from following and sophisticated investors and traders from investing and trading in conglomerates leading to lower information production about multi-segment firms compared to single-segment firms.

In Table 2, we analyze the link between firm complexity and information production about the firm by comparing single-segment firms and conglomerates across several dimensions. We specifically investigate the impact of business complexity on the information production of equity analysts, institutional investors and short sellers. Furthermore, we also investigate the differences in accounting disclosure quality of conglomerates and single-segment firms where the accounting disclosure quality is measured using segment disclosure quality. For institutional ownership and share of short selling activity we use traditional measures utilized in the literature. For analyst coverage, in addition to utilizing the traditional measure of analyst coverage, the number of analysts following the firm, we also measure the quality of the coverage by analyzing the number and fraction of specialists following the firm. An analyst following a firm is categorized as a specialist in that quarter, if the analyst covers five or more firms in the same industry in a given quarter (we use both two-digit and three-digit SIC codes to define an industry). For a conglomerate, specialists are defined using the industry affiliation of its main segment.

Size potentially has a large confounding effect on the link between firm complexity and information production about the firm. While conglomerates are harder to understand due to their business complexity, the benefits of understanding conglomerates can be greater due to their larger size. Thus, in order to assess how business complexity impacts information production, we have to control for size by comparing conglomerates to single-segment firms of similar size.

In Panel A of Table 2, we define firm size as its market cap and distribute conglomerates and single-segment firms into size deciles formed using CRSP breakpoints. While this method of controlling for size is imperfect, it turns out powerful enough to elicit that conglomerates have less analyst coverage and their coverage is of lower quality than that of single-segment firms. In all size deciles, conglomerates are followed by fewer analysts and fewer specialists. We also observe that a smaller percentage of analysts covering conglomerates are specialists. The biggest difference is in the number of specialists, as single-segment firms have 25% to 40% higher percentage of specialists. Both the relative and absolute differences in the analyst coverage peak in size deciles six to eight, suggesting that conglomerates which suffer from lower quality coverage are relatively large firms and are not obscure/micro-cap multi-segment firms.

Once we control for size we also find that conglomerates suffer from larger analyst forecast errors due to the lower quality and the quantity of analyst coverage they receive. As the second bottom row of Panel A suggests, conglomerates have larger analyst forecast errors in all size deciles but one (decile two), and the difference is material: on average, conglomerates have 15% larger forecast errors compared to single-segment firms controlling for size. Once again, the difference is mainly observed in the deciles with the largest conglomerate population: the differences in forecast errors are particularly large, in relative terms, in size deciles seven, nine and ten. Not only do we find the forecast errors to be larger for conglomerates compared to single-segment firms of similar size, but we also find the forecast dispersion regarding conglomerates is also larger (except for the two smallest size deciles) suggesting that market participants face a lot more uncertainty about conglomerates than comparable single segment firms.

Further enhancing our hypothesis, we find that institutional investors and short sellers also find processing information about conglomerates harder. Before controlling for size, conglomerates have significantly more institutional ownership compared to single-segment firms. Sorting firms into size-deciles, however, leads to a significantly different conclusion. We find that while in size-deciles five, six and seven conglomerates have more institutional ownership, the opposite is true in size deciles eight, nine and ten, somewhat counter to what one would expect. We observe similar patterns regarding share turnover and relative short interest, as the difference in short interest (turnover) between single-segment firms and conglomerates increases with firm size. Taken together, our analyses suggest that there is less information about conglomerates compared to single-segment firms of similar size and that the difficulty of information processing is especially higher for larger conglomerates.

In Panel B2, we control for size in a different way: we match each conglomerate to a single-segment firm with the closest market cap. We observe again, consistent with Panel A, that conglomerates are followed by 1-2 analysts and specialists less than single-segment firms of comparable size, which constitutes a difference of 20-30% in the quality of analyst coverage. In terms of fraction of specialists, we find, for example, that on average 70% of analysts covering a single-segment firm specialize in its three-digit SIC industry, but only 57% of analysts covering a conglomerate specialize in the three-digit SIC industry of its main segment. All differences in analyst coverage are highly statistically significant and are observed in the vast majority of quarters. As a consequence of lower quality analyst coverage, Panel B2 also reports that analyst forecast error is 18% higher for conglomerates than it is for single-segment firms of the same size, and the difference is significant with a t-statistic of 3.29. A similar result is observed for analyst forecast dispersion as forecast dispersion is 33% higher for conglomerates than it is for single-segment firms of the same size (.24 vs .18), and the difference is significant with a t-statistic of 3.24. We find similar patterns for institutional ownership, relative short interest and turnover. While before size-matching the average conglomerate has 3.8% more institutional ownership, after size-matching, the level of institutional holding is indistinguishable between conglomerates and single segment firms. Similarly, the difference in the relative short interest (RSI) in single-segment firms and conglomerates also increases after size-matching. Before-size matching average RSI for conglomerates is 2.2%, while it is 2.5% for single-segment firms for a 0.3% difference in favor of single-segment firms. After size-matching this difference becomes even more severe and increases to 0.5%. A very similar pattern is observed for turnover as before-size matching is 0.6% higher in favor of single-segment firms, but size-matching increases this difference to 1.4%.

Significant differences between Panels B1 and B2 illustrate the importance of controlling for size when comparing conglomerates and single-segment firms for variables related to information production. If we do not match by size, we would find that information production about conglomerates, due to their larger market cap, is significantly more. This, in turn, would lead to significantly misleading conclusions.

In Panel C we run panel regressions to better illustrate the role organizational structure plays on analyst coverage, institutional ownership, relative short interest and turnover[14]. In doing so, in addition to firm size, we control for CAPM-beta, book-to-market, lagged returns, momentum returns, share price, capital structure, firm-age and other firm-characteristics deemed relevant by extant literature where necessary. Regression results are in complete agreement with the results presented in Panels B and C as the coefficient on business complexity is negative and statistically highly significant regardless of the dependent variable as well as regardless of whether we use Conglo, Comp or Nseg as our proxy of business complexity.

In Table 2, we find that while a representative conglomerate is covered by somewhat larger number of analysts than a representative single-segment firm due to the conglomerate being much larger, this extra coverage is of poor quality, since it comes primarily from non-specialists and probably even dilutes the average analyst quality. Controlling for the confounding effect of size makes the negative relation between firm complexity and the quality of analyst coverage really stand out: when compared to single-segment firms of similar size, conglomerates are followed by a fewer number of analysts and specialists, and those analysts make larger forecast errors. Lower information quality production about conglomerates compared to single-segment firms of similar

[14] For the panel regressions we run Panel C of Table 2 we cluster standard errors a-la Peterson (2009).

size is not confined to analysts. We also find that institutional investors and short-sellers face similar difficulty about understanding conglomerates. We conclude that the complex nature of operating in multiple lines of business makes conglomerates significantly more difficult to understand in the eyes of market participants including equity analysts, institutional investors and short sellers. Next, we investigate the implications of hard-to-process information regarding conglomerates on how the market reacts to firm-specific information about them compared to single-segment firms.

4.2 Main Result: Business Complexity leads to higher Post Earnings Announcement Drift

Table 3 presents our main results, as we study the relation between PEAD and business complexity. We perform Fama-MacBeth (1973) regressions with post-announcement cumulative abnormal returns (CAR(2;60))[15] on the left-hand side and earnings surprise (SUE) and its interaction with alternative measures of firm complexity on the right-hand side. Our measure of PEAD is the (positive) slope on SUE. Higher values of complexity measures utilized in this study correspond to a higher degree of complexity by construction. In this context observing a stronger PEAD for complex firms is associated with finding a positive coefficient on the interaction of SUE and complexity[16].

The literature on price momentum (see, e.g., Lee and Swaminathan, 2000, Lesmond et al., 2004, Zhang, 2006, and others) finds a puzzling absence of momentum for microcaps (stocks in the lowest NYSE/AMEX market cap quintile). Consequently, all results that momentum is stronger for firms with higher limits to arbitrage hold only in the sample with microcaps excluded. Since PEAD and price momentum are two related anomalies, we choose to exclude microcaps from our analysis as well. Another benefit of excluding microcaps is that microcaps are dominated by single-segment firms, and our regression analysis that compares PEAD for single-segment firms and conglomerates would have virtually no basis for such a comparison among microcaps.

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[15] We use size and book-to-market adjusted abnormal returns as in DGTW.

[16] We compare PEAD for comparable levels of earnings surprise in an effort to understand whether investors take longer to process the same amount of information when they are confronted with more complex firms. A positive loading on the interaction of business complexity with SUE, however, would also imply a tradable strategy as described in Fama (1976), who shows in Chapter 9 that slopes from Fama-MacBeth regressions are returns to tradable portfolios. In Tables 4 and 9, we further study the tradability of this strategy using portfolios.

The first column in Table 3 estimates PEAD in the pairwise regression of CAR(2;60) on SUE. The regression estimates that the difference in SUE between the 97.5th and 2.5th (95th and the 5th) SUE percentiles implies a CAR of 3.23% (1.64%) in the three months following the announcement.

In the second column, we perform the first test of our main hypothesis by regressing CARs on SUE, the conglomerate dummy, and the interaction of SUE and the conglomerate dummy. The interaction of the conglomerate dummy and SUE is highly significant and suggests that for conglomerates PEAD is 2.3% (1.17%) greater per three months than it is for single-segment firms when we estimate the difference in the PEADs by using the SUE differential between the 97.5th and the 2.5th (95th and 5th) SUE percentiles[17].

The third column estimates the relation between PEAD and conglomerate status controlling for the effect of Size, BM, conglomerate status and the interaction of SUE with Size and BM respectively. We find that controlling for the interactions of SUE with fundamental firm characteristics increases the loading on the interaction term between SUE and the conglomerate dummy approximately by 25%.

Columns four and five repeat the analyses conducted in columns two and three, and replace the conglomerate dummy with the continuous complexity measure Comp, 1-HHI. The results in columns four and five are qualitatively similar to the results in columns two and three: more complex firms have significantly stronger PEAD for the same level of SUE, and this relation increases in magnitude when we control for Size, BM, Comp and the interactions of SUE with Size and BM. The magnitude of the coefficient on the product of SUE and the complexity measure, Comp, suggests that the effect of the interaction term on PEAD is roughly equal to the impact estimated in columns two and three: the median level of the complexity variable for conglomerates is about 0.37[18], thus the slope of 0.184 in column five would estimate the difference in PEADs of a representative single-segment firm and a representative conglomerate at 1.81% (0.94%) when the SUE differential between the 97.5th and the 2.5th (95th and 5th) percentiles is used in the estimation.

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[17] We control for Conglo in this regression but don't report it. For brevity, in this paper we only report the effect on SUE and the interaction of SUE with the independent variables used.

[18] Complexity of 0.37, or HHI equal to 0.63, roughly corresponds to a two-segment firm with one segment taking slightly over 75% of sales, or to a three-segment firm with one segment taking 78% of sales and the other two taking 12% and 10% respectively.

Columns six and seven use the number of segments (with different two-digit SIC codes) as a proxy for complexity. Once again, the interaction term between SUE and complexity, Nseg, is statistically significant and the economic significance of the interaction term increases after controlling for complexity, Size, BM and the interactions of SUE with Size and BM, and is qualitatively similar to the effect documented in columns two to five.

4.3 Controlling for Announcement Effects and Comparison of Delayed Response Ratios

One possible explanation of why complex firms have stronger PEAD is that the information revealed by complex firms on the announcement day takes longer to diffuse. However, an alternative explanation would suggest that, for the same level of earnings surprise, more information is revealed to the market on the announcement day in the case of complex firms. If this indeed is the case, then for complex firms we should see a stronger response around the announcement event followed by a stronger drift. Empirically, the alternative scenario would suggest that regressing announcement returns (CAR(-1;+1)) as well as the post earnings announcement drift returns (CAR(2;+60)) on the interaction of SUE and firm complexity, would both yield a positive coefficient.

In Panel A of Table 4, we perform Fama-MacBeth regressions of announcement returns (size and book-to-market adjusted as in DGTW, cumulated over the period from the day before to the day after the earnings announcement) as well as PEAD returns on the top decile earnings surprise dummy (SUETop), its interactions with Conglo, Size and BM, as well as Conglo, Size, and BM themselves. Following our approach in Table 3, we exclude microcaps (firms with market cap in the lowest NYSE/AMEX size quintile) from the sample. SUETop is 1 for the top SUE decile and 0 for the bottom SUE decile and helps us capture hedge returns to going long on the highest SUE decile and going short on the lowest SUE decile. CAR(-1;+1) column in the Panel A of Table 4 reveals that the interaction of SUETop with Conglo is zero and statistically insignificant. This finding indicates that single-segment firms and conglomerates have similar hedge returns in the three days around earnings announcements, and suggests that it is unlikely that there is more news released by conglomerates with respect to single-segment firms for the same level of earnings surprise. On the other hand, the CAR(2;+60) column in the Panel A of Table 4 clearly indicates that a hedge strategy of going long on the highest SUE decile and going short on the lowest SUE decile would net larger PEAD hedge-returns for conglomerates than single-segment firms as the interaction of SUETop and

Conglo is economically and statistically significant. Taken together, results in the CAR(-1;+1) and CAR(2;+60) columns, suggest that conglomerates under-react to earnings announcements when compared to single-segment firms.

Following Dellavigna and Pollet (2009) we quantify the magnitude of the earnings surprise under-reaction for conglomerates. We utilize the results in Panel A to estimate what fraction of information in the earnings announcement is incorporated into stock prices outside of the earnings announcement window. Specifically, in Panel B, we calculate the ratio of the drift return, CAR(+2,+60), to the total earnings reaction return, CAR(-1,+60), to measure the delayed response ratio for single-segment firms and conglomerates, respectively, and calculate the difference in the delayed response ratios for these two groups of firms for a hedge portfolio that trades in extreme positive (negative) surprise earnings deciles. We find that the delayed response ratio for this hedge trade is 42.4% (31%) for conglomerates (single-segment firms), which is 11.4% more than it is for the delayed response ratio faced by single-segment firms. Our analysis lends further support to the interpretation that investors have more difficulty processing earnings related information regarding conglomerates and that information processing takes more time for complex firms. The portfolio approach adopted to measure the delayed response ratio also makes it abundantly clear that it is indeed possible to trade this strategy.

4.4 Impact of Complexity on PEAD in Event-time

Cohen and Lou (2012) find that returns to pseudo-conglomerates, made up of single-segment firms, predict the returns to conglomerates in the next month and conclude that firm complexity slows down investors' reaction to industry-wide news. The industry-wide news is first reflected in the prices of simple firms and then the prices of complicated firms move in the same direction. Cohen and Lou find that the predictability is limited to only one month: it takes the investors in complicated firms only one extra month to process the industry-wide shocks and set the prices of conglomerates roughly right, or at least make them unpredictable using returns to single-segment firms.

As this paper shows, earnings-related information is another type of information investors in conglomerates have trouble digesting. Thus, it is interesting to find out whether reacting to earnings related information also takes investors in multi-segment firms a month, as in the related example documented in Cohen and Lou, or longer.

To this end, in Table 5 we disaggregate post-announcement cumulative abnormal returns (size and book-to-market adjusted as in DGTW) into three pieces - CAR(2;20), CAR(21;40), and CAR(41;60) - each approximately a month long and re-run the regressions from Table 3 for each sub-period separately. We repeat our analyses for alternative measures of complexity. In particular Panel A uses conglomerate status, Conglo; Panel B uses 1-HHI measure, Comp; and Panel C uses number of segments, NSeg, as our proxy for business complexity.

The first column of each panel in Table 5 repeats our main analysis in Table 3. The next three columns conduct the same regression, by utilizing alternative CAR windows. Each column is labeled with the event window utilized in that column. We find that the dependence of PEAD on firm complexity stays visible for two months, being, if anything, stronger in the second month. In the third month, the interaction between SUE and complexity loses statistical significance, while remaining economically significant. On the other hand, in the third month, PEAD is insignificant for single-segment firms, too, and the (point estimate of the) ratio of PEAD for simple and complicated firms does not seem to change much with time. Our results are similar whichever complexity measure we utilize.

We conclude therefore that it takes investors in complicated firms longer to process earnings related information than it takes them to process industry-wide shocks studied by Cohen and Lou (2012). The difference in PEADs between simple and complicated firms lasts for at least two months.

4.5 Impact of Changes to Organizational Form on the Post Earnings Announcement Drift

While all proxies for limits to arbitrage we considered are negatively related to complexity and therefore cannot explain our finding that PEAD is stronger for complex firms, it is still possible that complexity and conglomerate status in particular are related to a certain unknown variable that in turn affects the strength of PEAD.

In an effort to understand if investors really have difficulty interpreting information related to more complicated firms we focus on periods during which firm complexity increases. If the level of firm complexity (conglomerate status) is related to a certain unknown variable that also drives PEAD, then new conglomerates would likely have little exposure to this variable and one would expect new conglomerates to have low levels of PEAD. Under our hypothesis, however, investors should have the greatest confusion when interpreting earnings announcements of new conglomerates, due to the significant and recent change to their complexity level.

In Panel A of Table 6, we use a dummy variable for the change in the conglomerate status called NewConglo. NewConglo is set to one in the year after the firm switches from having one segment to having more than a single segment, continues to be one for another year, and becomes zero afterwards. NewConglo is also zero in all years when the firm has only one segment. In an average year, we have about 5,000 firms with segment data, about 1,300 conglomerates, and 120-200 new conglomerates, for which NewConglo is 1. Thus, new conglomerates comprise 2.5-4% of our sample and 10-15% of all conglomerates.

The first column of Panel A presents our baseline regression from column three of Table 3 (post-announcement CAR on SUE, the Conglo dummy, Size, BM and the interactions of SUE with Size, BM and Conglo) with the NewConglo dummy and its interaction with SUE added. The slope on the product of SUE and NewConglo estimates the extra PEAD experienced by new conglomerates as compared to existing conglomerates, since Conglo is, by construction, always 1 when NewConglo is 1.

We make two important observations based on the analysis conducted in the first column of Panel A in Table 6. First, PEAD experienced by existing conglomerates (firms that have been conglomerates for more than two years) is more than twice the PEAD experienced by single-segment firms. The regression estimates suggest that PEAD is 1.31% (per three months after the announcement) for single-segment firms and 2.32% for existing conglomerates when we use the difference between the 95th and the 5th percentiles of SUE to calculate differences in PEAD[19]. We conclude that controlling for the effect of new conglomerates does not reduce the significance of the interaction term between PEAD and the conglomerate dummy. The interaction term is as strong as it is in Table 3, which suggests that stronger PEADs for more complex firms cannot be attributed to firms that recently have become conglomerates.

Second, we do find that PEAD is significantly stronger for new conglomerates than it is for single-segment firms as well as it is for existing conglomerates. The product of SUE and NewConglo dummy is statistically significant and its coefficient implies that for new conglomerates

[19] The estimates of PEAD would be roughly twice in magnitude for both single-segment firms and existing conglomerates if we instead use the difference between the 97.5th and the 2.5th percentiles of SUE.

PEAD is 4.7% per three months, almost double that of existing conglomerates and more than four times that of single-segment firms.

How are new conglomerates created? In roughly two-thirds of the cases, we are able to trace the increase in the number of segments to M&A activity using SDC data. In the other one-third of the cases it appears that the firm expands from within, starting a new line of business on its own. The estimates of PEAD would be roughly twice in magnitude for both single-segment firms and existing conglomerates if we instead use the difference between the 97.5th and the 2.5th percentiles of SUE.

In the next two columns of Panel A we try to estimate the PEADs of new conglomerates formed through acquisitions (we replace NewConglo with NewCongloM&A, which equals one only if the change in the conglomerate status can be attributed to a merger with a firm from a different two-digit SIC code on SDC) and the PEADs of new conglomerates created from within (replacing NewConglo with NewCongloNoM&A, which equals one only if the change in the conglomerate status cannot be traced back to a corresponding merger).

We do not have a strong prior regarding whether becoming a new conglomerate through M&A activity or via expansion from within leads to more confusion on the part of investors. On the one hand, the segment added through M&A activity is more likely to be completely new to the firm (whereas the new line of business could have been developing within the firm for several years before the firm starts reporting it as a separate segment) and firms may prefer to expand through M&A activity when venturing into more "distant" industries. These considerations would suggest that stronger PEADs for new conglomerates would be more attributable to new conglomerates formed through M&A activity. On the other hand, both the acquirer and the target receive a lot of scrutiny during a merger, and the target also has a history as a stand-alone firm before the merger. Such scrutiny and the availability of historical information about the target might suggest that higher PEADs for new conglomerates might be driven by new conglomerates that are formed via expansion from within rather than those that are formed through M&A activity.

Panel A strongly supports the latter view. In column two, which singles out new conglomerates that are created through mergers, we find that PEAD is higher only by 0.5% per three months for these new conglomerates than it is for existing conglomerates (the difference, measured by the slope on the product of SUE and NewCongloM&A, is statistically insignificant). In column three though, we focus on new conglomerates that are created from within (i.e., not through a merger), and we discover a huge difference in the PEADs of these new conglomerates and the PEADs of existing conglomerates. Substituting the difference in SUE between the 95th and the 5th percentiles into the regression in the third column, we estimate the average PEAD for single-segment firms at 1.1% (per three months after the announcement), the average PEAD of existing conglomerates at 2.3%, and the average PEAD of new conglomerates created from within at a whopping 8.8%. We conclude therefore that the stronger average PEAD for firms that have recently become conglomerates is attributable primarily to firms that have created a new line of business from within, without merging with another firm from a different industry.

In Panel B, we utilize a different measure of increase in complexity: the SegInc dummy that equals 1 for all firms that experience an increase in the number of segments in the past two years and zero otherwise (by definition, SegInc is zero for all single-segment firms). Firms with SegInc=1 include firms with NewConglo=1 as a subset, but some firms with SegInc=1 are not new conglomerates, they are old conglomerates that have expanded into yet another industry (for example, a firm that reports three segments in year t and four segments in years t+1 and t+2 will have SegInc=1 in years t+1 and t+2).

The obvious upside of using SegInc instead of NewConglo is that there are more firms that experience an increase in the number of segments than those that become new conglomerates. In fact, in a representative year, there are on average 180 firms that add a new segment, while the number of single segment firms that become new conglomerates never exceeds 100 (the number of firm-years with SegInc(NewConglo)=1 is twice the number of firms that experience an increase in segments (that become a new conglomerate), because we track new conglomerates and firms with an increase in the number of segments for two years). The downside of using SegInc is that adding an extra segment to a three-segment firm is clearly a less drastic change than turning a single-segment firm into a conglomerate.

In the first column of Panel B, we regress CAR on SUE, its product with the number of segments (NSeg), and its product with SegInc, as well as NSeg and SegInc by themselves. We use NSeg rather than the Conglo dummy (used in Panel A), because now we are comparing not the PEADs of new and old conglomerates, but rather the PEADs of conglomerates with the same number of segments that have and have not recently experienced an increase in the number of segments. This is what the slope on the product of SUE and SegInc measures: the difference in PEADs between, say, two three-segment firms, one of which has recently become a three-segment firm (out of a single-segment or a two-segment firm) and the other that has stayed as a three segment firm for at least two years.

The first column of Panel B finds that firms with a recent increase in the number of segments have significantly higher PEADs as compared to firms with the same number of segments that have not experienced a change in their number of segments. Substituting the differential between the 95th and the 5th SUE percentiles, we estimate the average PEAD for a single-segment firm at 1.15% (per three months after the announcement) for a three-segment firm with no recent increase in the number of segments at 2.59%, and for a three-segment firm that recently added a new segment (or two) in the past two years at 4.88%[20]. As the regression suggests, the difference in PEADs between the latter two types of firms is also statistically significant with a t-statistic of 2.26.

In the next two columns, we disaggregate segment increase (SegInc=1) events into two subsets: one group of events attributable to M&A activity (those cases of a firm adding a segment or several segments that can be traced to M&A activity on SDC) and a second group of events that are not attributable to such activity, and instead most likely attributable to adding a new line of business for which the firm deploys its internal resources. The estimates in the second column suggest that an increase in the number of segments through M&A has an economically sizeable, but statistically insignificant effect on PEAD: the difference in PEAD between two, say, three-segment firms, one of which added a segment or two through M&A in the past two years and the other one that did not is 1.31% (per three months after the earnings announcement), with a t-statistic of 0.93. The third column of Panel B, consistent with the third column of Panel A, shows that adding segments from within impacts firm complexity more. Comparing two firms with the same number of segments shows that, the firm that adds a new line of business by growing from within has a PEAD that is 3.85% greater than the PEAD of the firm which adds a new line of business through M&A activity.

To sum up, Table 5 strongly suggests that the increase in complexity (defined either as an increase in the number of segments or as the change in the conglomerate status) is associated with a large increase in PEAD, consistent with our hypothesis that it is firm complexity (and not any other characteristic common to conglomerates) that creates stronger PEAD. We also find that investors

[20] The regressions in Panel B assume that the slope on SUE equals $a+b\cdot N\ Seg + c\cdot SegInc$, where a is the slope of the SUE term, b is the slope of the interaction of SUE and NSeg, c is the slope of the interaction of SUE and SegInc. Hence, the PEAD of single-segment firms is a + b times the SUE differential.

are most confused about firms that expand from within, i.e. about those firms that add segments without being involved in M&A activity.

4.6 Does the Degree of Complexity Matter? Using Hirshleifer and Teoh (2003) Measure

In the previous sections we have established that there is a strong relationship between organizational structure and the strength of PEAD. In this section we investigate if PEAD is stronger for more complicated conglomerates. In doing so we construct a measure proposed by Hirshleifer and Teoh (2003) that enables us to rank conglomerates based on their level of complexity.

Hirshleifer and Teoh (2003) suggest that the high cognitive processing costs associated with analyzing earnings growth at the segment level leads at least some investors to focus on aggregated information even if segment level data are available. In line with this hypothesis they propose that even if only some investors use aggregate firm earnings growth rates to estimate future firm values, instead of using segments' individual earnings growth rates, these conglomerates will be mispriced. Hirshleifer and Teoh (2003) interpret the dispersion of the segment growth rates as a measure of investor inattention imposed by the high cognitive processing costs due to harder-to-process nature of such information. They suggest that the level of mispricing (cognitive processing costs) will increase with the dispersion of the segment growth rates.

We construct a new empirical proxy of conglomerate complexity following Hirshleifer and Teoh's (2003) measure of investor inattention (cognitive processing costs). We call this measure HTSD (Hirshleifer-Teoh-Segment-Dispersion) and calculate it as $HTSD = \sum_{i=1}^{N}(E_i - f)^2 * S_i$, for a firm with N segments that has an aggregate earnings growth rate of f, where each segment i has growth rate E_i, and sales share as a percentage of the firm's total sales which is equal to S_i. We also compute log of one plus HTSD, LogHTSD, to account for HTSD's high skewness.

In the first column of Table 7, controlling for the effects of size and book-to-market and their interactions with SUE, we analyze the interaction of HTSD with SUE and find that conglomerates with greater segment earnings growth dispersion have larger post-earnings announcement drifts compared to other conglomerates for the same level of SUE. The interaction term is 0.2 and statistically significant. The interaction term indicates that the PEAD returns between the 97.5th and the 2.5th SUE percentiles for a conglomerate that is in the top decile based on the segment growth dispersion measure[21] would be 1.55% more than the PEAD returns between the 97.5th and the 2.5th SUE percentiles for a conglomerate that is in the bottom decile based on the HTSD measure. In column two of Table 7 we repeat the same analysis using LogHTD and reach similar qualitative and quantitative conclusions.

Results in Table 7 are in clear agreement with the theoretical deductions of Hirshleifer and Teoh (2003). Investors have more difficulty in understanding earnings related information regarding conglomerates with larger dispersion in their segment earnings growth rates. Our results indicate that market participants take longer to incorporate earnings related information into the prices of more complicated conglomerates in line with Hirshleifer and Teoh's (2003) suggestion that complexity introduces cognitive processing costs which lead to limited attention. These results also help establish the fact that the degree of complexity also matters in determining the magnitude of PEAD as there is cross-sectional variation in the magnitude of PEAD with respect to business complexity in a universe of firms composed solely of conglomerates.

5. ROBUSTNESS TESTS

5.1 Controlling for Potential Spillover from Industry-wide Information Events on PEAD

The return predictability documented by Cohen and Lou (2012), though clearly different from our result, can potentially overlap with it in the following way: if the industries the conglomerate operates in are doing well in month t-1, the conglomerate is more likely to report good earnings in month t. If the earnings are particularly good, they will be followed by the post-announcement drift. However, part of this drift, at least in the first month (month t), can be explained by good returns to the pseudo-conglomerate in month t-1. Thus, the predictability documented by Cohen and Lou (2012) can partially explain why PEAD is stronger for conglomerates.

Our prior is that the overlap between our result and the Cohen and Lou result is not strong. First, Cohen and Lou show that their predictability of conglomerate returns in month t using pseudo-conglomerate returns in month t-1 is attributable primarily to the first two weeks of month t. Since an average earnings announcement happens in the middle of the month, it would be fair to say that we will be missing those two weeks most of the time. Second, the predictability in Cohen

[21] The average for HTSD is 0.19 among conglomerates. The 90th percentile value of HTSD is .336 while the 10th percentile value for HTSD is 0.013.

and Lou lasts for only one month, whereas the stronger PEAD for conglomerates lasts for at least two months, as Table 5 shows.

In Table 8, we explicitly control for pseudo-conglomerate returns (PCRet) by adding it into our main regressions of CARs on SUE, complexity, and the product of SUE and complexity. Following Cohen and Lou, PCRet is computed by first taking an equal-weighted average return of all single-segment firms in each two-digit SIC industry, and then, for each conglomerate, value-weighting the industry returns by the fractions of the segments with the same two-digit SIC code that comprise the total sales of the conglomerate.

Since our sample has to include both single-segment firms and conglomerates in order to compare the PEADs for the two types of firms, we have to substitute an alternative variable for "PCRet" for single-segment firms. We define "PCRet" of single-segment firms as the return to single segment firms in the same industry, thus turning it into a measure of industry momentum. We also control for in our regressions both PCRet itself and the interaction of PCRet with the conglomerate dummy, to allow for different slopes on it for single-segment firms and conglomerates.

In the first column of Table 8, we regress CARs on SUE, Size, BM, interactions of SUE with Size and BM, PCRet and the interaction of PCRet with the conglomerate dummy. We observe two results. First, controlling for industry momentum in the form of "PCRet" for single-segment firms makes the slope on SUE somewhat smaller: it declines from 0.118 in the first column of Table 3 to 0.106 in the first column of Table 8. Second, we observe that PCRet itself is significant, while its product with the conglomerate dummy has a tiny, insignificant coefficient. This evidence implies that pseudo-conglomerate returns proposed by Cohen and Lou as well as measures of industry momentum are positively related to CARs[22]. Indeed, since PCRet picks up industry momentum in the single-segment firms subsample and the Cohen and Lou predictability in the conglomerate subsample, the tiny insignificant coefficient on the interaction of PCRet and the conglomerate dummy suggests that the slopes on PCRet are the same in both subsamples and the Cohen and Lou predictability for conglomerates is just as strong as industry momentum for single-segment firms.

[22] Strictly speaking, the correct way to estimate industry momentum would be to compute industry returns using all firms in the industry, including conglomerates. We tried that and found little change in the slope of "PCRet" for single-segment firms defined this way, which suggests that the average return to all single-segment firms in an industry is a good enough proxy for the true industry return.

The other three columns of Table 8 add to the regression in the first column a measure of complexity and its product with SUE. The slopes on the interaction of complexity with SUE estimate the additional PEAD experienced by conglomerates. The slopes estimated after controlling for the predictability documented in Cohen and Lou (2012) are similar in magnitude to the slopes estimated earlier in Table 3. We conclude that the stronger PEADs experienced by conglomerates is a separate phenomenon that has no overlap with the predictability of conglomerate returns using returns to pseudo-conglomerates as suggested by Cohen and Lou (2012).

5.2 Controlling for Alternative Explanations of PEAD

In Table 1 we show that conglomerates face lower limits to arbitrage compared to single-segment firms. Hence, higher PEAD for more complicated firms can't be explained by limits-to-arbitrage, in particular by the impact of institutional ownership (Bartov, Radhakrishnan and Krinsky 2000); arbitrage risk (Mendenhall 2004); transactions costs (Ng, Rusticus, and Verdi 2008) or liquidity on PEAD (Sadka 2006) as conglomerates on average have larger institutional ownership, have lower idiosyncratic volatility, lower bid-ask spreads and higher liquidity compared to single-segment firms.

In Table 9, we control for the potential impact of a large number of alternative explanations of the post-earnings announcement drift anomaly using Fama-Macbeth (1973) style regressions. In particular, we control for the impact of analyst responsiveness (Zhang 2008), the impact of ex-ante earnings volatility on earnings persistence (Cao and Narayanamoorthy 2012), the time-varying nature of earnings persistence (Chen 2013), as well as the impact of disclosure complexity (Miller 2010, You and Zhang 2009, Feldman, Govindaraj, Livnat, and Segal 2010, Lehavy, Li and Merkley 2011, Lee 2012) on PEAD in an effort to distinguish the impact of business complexity on PEAD.

The first column in Table 8 estimates the relation between PEAD and conglomerate status controlling for the effect of Size, BM, conglomerate status and the interaction of SUE with Size and BM respectively. This is a repetition of column (3) of Table 3 to remind the reader of our basic finding in the full sample. We use the results in column (1) of Table 9 as a benchmark for the other columns in Table 9. This is important since using additional controls in other columns reduces the sample size in other columns and we want to make sure that our basic conclusions don't change as the sample size changes.

In the second column of Table 9, we repeat the basic analysis conducted in column one for a subsample of firms for which we can calculate the time-varying earnings persistence variable (EP) proposed by Chen (2013)[23]. Results are qualitatively and quantitatively comparable to full-sample results. The third column estimates the relation between PEAD and conglomerate status controlling for the effect of Size, BM, Conglo, time-varying earnings persistence (EP) and the interaction of SUE with Size, BM, Conglo and EP respectively. We find that the interaction of SUE with EP has the predicted positive sign documented by Chen (2013). Controlling for the interaction of SUE with EP reduces the loading on the interaction term between SUE and the conglomerate dummy approximately by 20%. While this indicates there could be some overlap between the effect of time-varying earnings persistence introduced by Chen (2013) and business complexity, this overlap is not large enough to negate the higher PEAD we observe in conglomerates.

The fourth and fifth columns investigate the impact of business complexity on PEAD while controlling for the impact of disclosure complexity. Our proxy for disclosure complexity is the Gunning FOG index calculated as in Li (2008)[24]. In column four, we investigate the impact of business complexity on PEAD for the sub-set of firms for which we have textual complexity information. Column four reveals results consistent with our basic findings, in that conglomerates have higher PEAD compared to single-segment firms with similar characteristics in this sub-sample as well. In column five we find a surprising result. The interaction of SUE with FOG, our proxy for disclosure complexity, is negative and statistically significant suggesting that the post-earnings announcement drift anomaly in fact is smaller for firms with higher disclosure complexity. We believe this result could potentially indicate that the interaction of FOG with SUE is more likely to capture the impact of managerial obfuscation on PEAD, rather than the impact of firm complexity. One rational explanation would be that, having seen an overly complicated disclosure, investors interpret this as an effort by the management to obfuscate and reverse their reaction to the earnings surprise over the PEAD window. Future research may attempt to decompose FOG into firm-complexity and managerial obfuscation components as in Bushee et al. (2015) and analyze the

[23] Earnings Persistence (EP) is the firm-specific time-varying autocorrelation between two adjacent quarterly seasonally differenced earnings (SDE), where the autocorrelation is estimated in a two-step procedure using 14 persistence-related firm characteristics each quarter following Chen (2013).

[24] We got the data from Feng Li's website, for which we are grateful.

impact of these components on PEAD separately. Controlling for FOG doesn't affect our results as the interaction of SUE with Conglo in column (5) is statistically and economically significant and virtually indistinguishable from the results in column (4).

In columns six and seven, we analyze whether varying analyst responsiveness for conglomerates and single-segment firms could explain our results. Following Zhang (2008), we construct a measure of analyst responsiveness (DRESP) and investigate whether its interaction with SUE could reduce the economic and statistical impact of business complexity on PEAD. Column (6) reveals that our basic results go through for the sub-sample of firms with DRESP information. In column seven, we find that the interaction of SUE with DRESP is negative, qualitatively in line with Zhang (2008)'s prediction that more responsive analysts help investors react to earnings more timely and this leads to a reduction in PEAD[25]. Controlling for the impact of analyst responsiveness doesn't change our basic result regarding the impact of business complexity on PEAD as the interaction of SUE with Conglo is once again statistically and economically significant and positive.

In a recent paper Cao and Narayanamoorthy (2012) show that, contrary to the expectations of the market, firms with higher ex-ante (lower) earnings volatility (trading frictions) have lower (higher) earnings surprise (SUE) persistence and this leads to lower PEAD. Since conglomerates, on average, have smaller earnings volatility (EarnVol) and fewer overall trading frictions it is imperative that we control for this effect. In column eight, we analyze the impact of organizational structure on PEAD for a subset of firms for which we have ex-ante earnings volatility, calculated as in Cao and Narayanamoorthy (2012). We find that our results are virtually the same as the full-sample results in that conglomerates have larger PEAD for the same level of SUE compared to single-segment firms. In column nine we explicitly control for the impact of ex-ante earnings volatility on PEAD. Our results are consistent with Cao and Narayanamoorthy (2012), in that higher ex-ante earnings volatility leads to lower PEAD, as evidenced by the economically and statistically significant negative coefficient on the interaction of SUE and EarnVol. This, however, barely affects our main finding as the interaction of SUE with Conglo is 0.097 and statistically

[25] Unlike Zhang (2008), however, our interaction term is statistically insignificant. We attribute this difference mainly to methodology. When we use panel regressions, instead of Fama-MacBeth (1973) style regressions, the interaction term becomes significant.

significant. This leads us to conclude that our result about the impact of business complexity is distinct from the impact of ex-ante earnings volatility on PEAD.

Finally, in column ten we control for the impact of EP, FOG, DRESP and EarnVol along with business complexity and find that the interaction of SUE with Conglo is statistically and economically significant, verifying the distinctiveness of the effect we have uncovered in this paper.

5.3 Accounting for Non-Linearity in SUE and Using Alternative CAR Measures

In our final robustness section we use an alternative measure of abnormal returns namely four-factor Carhart alphas. In Table 10, we repeat our basic analyses from Table 3 using Carhart alphas on three alternatives measures of unexpected earnings surprise along with three alternative measures of firm complexity (Conglo, Comp, NSeg) for a total of nine regressions. In particular, we run quarterly Fama-MacBeth regressions of firm-specific Carhart alphas in the 60 trading days (one-quarter) following earnings announcements αC(2;60)) on earnings surprise (SUE), interactions of SUE with the measures of firm complexity (Conglo, Comp and Nseg) and with standard controls (Size and BM).

Columns one to three use the baseline definition of SUE, where we winsorize SUE at 99.5% and 0.5% percentile levels every given quarter in order to account for the non-linearity observed between SUE and future returns. In columns four to six we winsorize SUE at 95% and 5% percentile levels in a given quarter to account for both the non-linearity mentioned earlier as well to eliminate the possibility that extreme SUE values drive our results. Finally, in columns seven to nine we transform SUE into decile ranks to verify that our main result in this paper leads to a profitable trading strategy. We control for Size and BM in all regressions as well as Conglo, Comp, and Nseg wherever it is appropriate but for brevity we do not report the coefficients on these firm characteristics.

In column (1) of Table 10, we find that the interaction of SUE with Conglo is virtually unchanged in our basic specification when we replace Size and BM adjusted returns with Carhart-alphas. Similarly columns (2) and (3) reveal that interactions of SUE with Comp and Nseg, respectively, yield very similar results to those observed in Table 3, suggesting that whether we use Size and BM adjusted returns or Carhart alphas, we find larger PEAD’s for more complicated firms.

Similarly winsorizing SUE values at 5% and 95% points every quarter do not change our results. In columns (4) through (6) we find that the interaction of SUE with measures of firm complexity are all positive leading to higher PEADs. Results in columns (4) through (6) suggest that our results are not driven by extreme values of SUE.

Finally, in columns (7) through (9) we repeat our basic Fama-MacBeth (1973) regressions using Carhart-alphas and decile values for SUE. Our conclusions are unchanged as these regressions also predict higher PEAD values for firms with more complicated underlying businesses.

6. CONCLUSIONS

In this paper, we hypothesize and document that information about complex firms is harder to process, and predict therefore that PEAD is stronger for complex firms. Using organizational structure as our proxy for business complexity, we find that firms with more complicated organizational structures (conglomerates) have larger post-earnings announcement drifts compared to simpler firms (single-segment firms) for the same level of unexpected earnings surprise (SUE). Specifically, we find that conglomerates have post-earnings announcement drifts (PEAD's) that are twice as large as single-segment firms. The impact of complexity on PEAD lasts for at least two months, which leads us to conclude that investors of complex firms have even more trouble interpreting earnings-related information than they do interpreting industry-wide shocks (Cohen and Lou 2012). We investigate whether the phenomenon documented in this paper is related to the return predictability documented in Cohen and Lou (2012). We control for pseudo-conglomerate returns in our regressions and find that the interaction between SUE and complexity is unaffected, which means that there is virtually no overlap between the Cohen and Lou result and the stronger PEADs for conglomerates.

Our findings can't be explained by limits-to-arbitrage, in particular by the impact of institutional ownership (Bartov, Radhakrishnan and Krinsky 2000); arbitrage risk (Mendenhall 2004); transactions costs (Ng, Rusticus, and Verdi 2008) or liquidity on PEAD (Sadka 2006) as conglomerates on average have larger institutional ownership, have lower idiosyncratic volatility, lower bid-ask spreads and higher liquidity compared to single-segment firms. Rather, we attribute our findings to the fact that it is more costly and difficult to understand firm-specific earnings information regarding complicated firms and that information processing takes more time for complex firms, leading conglomerates to underreact to earnings surprises significantly more than single-segment firms. In order to assess how business complexity impacts information production, we control for size by comparing conglomerates to single-segment firms of similar size. We document that, once we control for firm-size and other fundamental firm characteristics, conglomerates have lower institutional ownership, lower short interest, lower segment disclosure quality, are covered by fewer analysts, these analysts have less industry expertise and they also make larger forecast errors.

Next, we investigate whether conglomerates release more news for the same level of unexpected earnings surprise (SUE) compared to single-segment firms. Our analysis finds no support for this view. Instead, we find that conglomerates underreact to earnings surprises more than single-segment firms as evidenced by larger delayed response ratios for conglomerates (42.4%) compared to single-segment firms (31%). Our analysis lends further support to the interpretation that investors have more difficulty processing earnings related information regarding conglomerates and that information processing takes more time for complex firms.

To address the concern that complexity is related to a certain unknown variable that also affects the strength of PEAD, we reexamine the effect of complexity on PEAD focusing on periods during which firm complexity increases. The analysis provides compelling evidence that supports our slower-information-processing hypothesis: PEAD is stronger for new conglomerates than it is for existing conglomerates, and it is also stronger for complicated firms that have recently experienced an increase in the number of its segments. We also find that investors are most confused about complicated firms that expand from within rather than firms that diversify into new business segments via mergers and acquisitions. We further conduct an investigation of Hirshleifer and Teoh's (2003) assertion that more complicated conglomerates, measured as those with greater dispersion in the growth rates of their segment level earnings, face larger mispricing. We find that more complicated conglomerates have larger PEADs than less complicated conglomerates. Our analysis indicates that the degree of complexity influences the level of PEAD and that the cognitive cost of processing more complicated segment-level information leads to larger investor inattention regarding more complicated conglomerates.

Our results are robust to controlling for the impact of analyst responsiveness, ex-ante earnings volatility, time-varying earnings persistence and disclosure complexity on PEAD. Not only that, but we also document that our results go through when we use Carhart-alphas instead of size and book-to-market adjusted returns and that our conclusions are robust to alternative definition of SUE such as using SUE values winsorized at .5% (99.5%), 5% (95/5) or simply using SUE deciles.

We conclude that business complexity, proxied via organizational structure, has a profound effect on how investors process earnings related information. Our analyses document that investors face larger cognitive processing costs regarding conglomerates which leads to larger inattention and ultimately larger post-earnings announcement drifts for firms with complicated underlying businesses.

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DATA APPENDIX

The variables are arranged in alphabetical order according to the abbreviated variable name used in the tables.

 # An (number of analysts; analyst coverage) - the number of analysts covering the firm (from IBES detail file).

Amihud (Amihud illiquidity measure) - the average ratio of absolute return to dollar volume, both from CRSP. The ratio is computed daily and averaged within each firm-year (firms with less than 200 valid return observations in a year and firms with stock price less than $5 at the end of the previous year are excluded)

CAR(-1;+1) (announcement return) - size and book-to-market adjusted cumulative daily returns between the day prior to the earnings announcement and the day after the earnings announcement. Earnings announcement dates are from COMPUSTAT, daily returns are from CRSP daily files, size and book-to-market adjustment is performed following Daniel et al. (1997)

CAR(2;60) - size and book-to-market adjusted cumulative daily returns between the second day after the earnings announcement and the 60th day after the earnings announcement.

CAR(2;20) (CAR(21;40), CAR(41;60)) - size and book-to-market adjusted cumulative daily returns between the second (21st, 41st) day after the earnings announcement and the 20th (40th, 60th) day after the earnings announcement.

Complexity (firm complexity) - 1-HHI, where HHI is the Herfindahl index computed using segment sales, $HHI = \sum_{i=1}^{N} s_i^2$. N is the number of segments (from Compustat segment files, segments with the same two-digits SIC code are counted as one segment), s_i is the fraction of total sales generated by segment i.

Conglo (conglomerate dummy) - 1 if the firm is a conglomerate, 0 otherwise. The firm is a conglomerate if it has business segments in more than one two-digit SIC industry.

Gibbs (Gibbs measure) - the slope from the regression $\Delta P_t = a + c\Delta Q_t$, where P_t is the stock price and Q_t is the trade direction indicator. The values of the Gibbs measure are taken from the website of Joel Hasbrouck and are available from January 1964 to December 2009. For more details, please refer to Hasbrouck (2009).

IO (institutional ownership) - the sum of institutional holdings from Thompson Financial 13F database, divided by the shares outstanding from CRSP. All stocks below the 20th NYSE/AMEX size percentile are dropped. If the stock is not dropped, appears on CRSP, but not on Thompson Financial 13Fs, it is assumed to have zero institutional ownership.

IVol (idiosyncratic volatility) - the standard deviation of residuals from the Fama-French model, fitted to the daily data for each firm-month (at least 15 valid observations are required).

NewConglo (new conglomerate dummy) - 1 if the firm became a conglomerate in the past two years (the year of the change in the conglomerate status excluded), zero otherwise. Single-segment firms always have NewConglo=0.

NSeg (number of segments) - the number of business segments the firm has (from Compustat segment files). Segments with the same two-digit SIC code are counted as one segment.

PCRet (pseudo-conglomerate return) - For each conglomerate firm, a pseudo-conglomerate consists of a portfolio of the conglomerate firm's segments made up using only stand-alone firms from the respective industries. For each portfolio that corresponds to a specific segment of the conglomerate firm an equal-weighted return is calculated. Returns corresponding to each segment are then value weighted according to that segment's contribution to the conglomerate firm's total revenues in order calculate a corresponding pseudo conglomerate return.

Res # An, Res # Spec (residual number of analyst/specialists) - the number of analysts/specialists following the firm orthogonalized to size. The orthogonalization is performed by running a cross-sectional regression of the number of analysts/specialists on size in each quarter and taking the residuals.

Roll (Roll measure) - the estimate of effective bid-ask spread, computed as $Roll_t = 200 \cdot \sqrt{abs(Cov(R_t, R_{t-1}))}$

SegInc (segment increase dummy) - 1 if the firm experienced an increase in the number of segments in the past two years (the year of the change excluded), zero otherwise. Single-segment firms always have SegInc=0.

 # Spec (number of specialists) - the number of analysts covering the firm who are specialists in the firm's industry. An analyst is considered a specialist in the firm's industry if he/she covers at least five other firms with the same two-digit (# Spec2) or three-digit (# Spec3) SIC code in the same quarter. For a conglomerate, an analyst is classified as a specialist based on the industry affiliation of the largest segment.

% Spec (percentage of specialists) - the number of specialists following the firm (# Spec) divided by the number of analysts following the firm (# An).

SUE (earnings surprise) - standardized unexpected earnings, computed as

$$SUE_t = \frac{E_t - E_{t-4}}{P_t}$$

where E_t is the announced earnings per share for the current quarter, E_{t-4} is the earnings per share from the same quarter of the previous year, and P_t is the share price for the current quarter.

Size (market cap) - shares outstanding times price, both from the CRSP monthly returns file. Size is measured in billion dollars.

Spread - the spread implied by the daily high and low prices. Spread is calculated by the formula from Corwin and Schultz (2012):

$$Spread = \frac{2 \cdot (exp^{\alpha} - 1)}{1 + exp^{\alpha}}, \quad \text{where}$$

$$\alpha = \frac{\sqrt{\beta} \cdot (\sqrt{2} - 1)}{3 - 2\sqrt{2}} - \sqrt{\frac{\gamma}{3 - 2\sqrt{2}}}, \quad \text{where}$$

$$\beta = log^2\left(\frac{HI_t}{LO_t}\right) + log^2\left(\frac{HI_{t+1}}{LO_{t+1}}\right) \; and \; \gamma = log^2\left(\frac{\max(HI_t, HI_{t+1})}{\min(LO_t, LO_{t+1})}\right)$$

where HI_t (LO_t) is the highest (lowest) price of the stock on day *t*.

Turn (turnover) - monthly dollar trading volume over market capitalization at the end of the month (both from CRSP), averaged in each firm-year.

Zero (zero frequency) - the fraction of zero-return days within each firm-year.

Table 1
Descriptive Statistics

Panel A1. SUE and Complexity Distribution - All Firms

	# Observations	Mean	Percentiles										
			1%	2.5%	5%	10%	25%	50%	75%	90%	95%	97.5%	99%
SUE	381,359	0.010	-0.317	-0.145	-0.075	-0.034	-0.007	0.002	0.008	0.029	0.064	0.129	0.302
Nseg	549,526	1.547	1	1	1	1	1	1.2	2	2.7	3.4	4	4.7
Comp	549,526	0.117	0	0	0	0	0	0.023	0.143	0.449	0.546	0.608	0.678

Panel A2. SUE and Complexity Distribution - Conglomerates Only

	# Observations	Mean	Percentiles										
			1%	2.5%	5%	10%	25%	50%	75%	90%	95%	97.5%	99%
SUE	111,588	-0.001	-0.271	-0.129	-0.067	-0.031	-0.007	0.002	0.008	0.026	0.053	0.101	0.220
Nseg	146,583	2.646	2	2	2	2	2	2.2	3.1	3.8	4.3	4.9	5.7
Comp	146,583	0.351	0.011	0.021	0.041	0.079	0.191	0.368	0.497	0.596	0.655	0.694	0.736

Panel B. Earnings Announcements

Panel B1. Raw Values				Panel B2. Absolute Values			
	Single	Conglo	S-C		Single	Conglo	S-C
SUE	0.156%	0.155%	0.001%	SUE	0.626%	0.660%	-0.03%
	(6.86)	*(4.03)*	*(0.06)*		*(17.40)*	*(17.20)*	*(-1.52)*
EA	0.137%	0.161%	-0.024%	EA	3.575%	2.866%	0.71%
	(2.80)	*(3.17)*	*(-0.59)*		*(12.50)*	*(14.40)*	*(5.67)*
# Observations	269,771	111,588		# Observations	269,771	111,588	

Table 1- continued

Panel C. Liquidity			
	Single	**Conglo**	**S-C**
Gibbs	0.54	0.389	0.151
	(13.3)	*(21.9)*	*(4.61)*
# Observations	244,834	103,904	
Spread	0.871	0.599	0.272
	(12.4)	*(13)*	*(5.2)*
# Observations	313,595	120,893	
Roll	1.525	1.2	0.325
	(17.8)	*(20.9)*	*(4.95)*
# Observations	320,381	122,410	
Amihud	3.686	2.201	1.484
	(3.73)	*(2.94)*	*(4.76)*
# Observations	163,056	73,220	
Zero	14.09	11.81	2.28
	(5.64)	*(5.87)*	*(3.85)*
# Observations	319,289	121,481	

Note: This table presents mean (Panels A and B) and median (Panel C) values of numerous firm characteristics for single-segment firms (``Single"), and conglomerates (``Conglo") as well as the difference between single-segment firms and conglomerates (S-C). Conglomerates are defined as firms with business segments in more than one industry (industries are based on two-digit SIC codes) with corresponding information in Compustat Segment files, single-segment firms are all other firms with information in Compustat segment files. Firm (business) complexity, *Comp*, is 1-HHI, where HHI is the Herfindahl index computed using segment sales within a conglomerate: for each segment, we compute the amount of sales generated by that segment as a fraction of the total sales of the firm and add up the squared fractions to compute HHI. *Nseg* is the number of segments the firm has. Segments are counted as distinct business units if they can be assigned to different two-digit SIC industries. *SUE* measures surprise unexpected earnings as $(E_t\text{-}E_{t-4})/P_t$, where E_t is the announced earnings per share for the current quarter, E_{t-4} is the earnings per share from the same quarter of the previous year, and P_t is the share price for the current quarter. *EA* measures earnings announcement reaction in percentage returns. Detailed explanations of *SUE*, *Nseg, Comp, EA* as well as firm level liquidity and information environment variables are in the Data Appendix. The differences for different firm characteristics between *Single* and Conglo firms are calculated quarterly and the time-series averages of these differences are reported in the difference columns. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses in Panels B and C. The sample period is from January 1977 to December 2010. The number of firm-quarters used in the analyses is abbreviated as *# Observations*.

Table 2
Comparing the Information Production for Conglomerates and Single-segment firms with similar firm characteristics

Panel A. Information Environment of Single-Segment firms and Conglomerates across size deciles

Panel A1. Single-Segment Firms

Size	Small	2	3	4	5	6	7	8	9	Big
# Analysts	1.2	1.5	1.9	2.4	3.0	3.6	4.5	5.7	7.2	11.4
# Specialists SIC2	0.8	1.0	1.4	1.8	2.3	2.9	3.7	4.8	6.3	10.4
# Specialists SIC3	0.6	0.9	1.2	1.5	2.0	2.5	3.3	4.3	5.7	9.7
% of Specialists SIC2	0.604	0.657	0.682	0.702	0.725	0.754	0.771	0.805	0.837	0.896
% of Specialists SIC3	0.472	0.533	0.564	0.576	0.606	0.633	0.662	0.696	0.736	0.820
Forecast Dispersion	0.524	0.520	0.406	0.380	0.364	0.269	0.213	0.220	0.158	0.112
Forecast Error	1.169	1.154	0.909	0.824	0.762	0.662	0.540	0.474	0.384	0.293
Segment Disclosure Quality	0.366	0.365	0.361	0.359	0.358	0.358	0.349	0.341	0.335	0.339
IO	0.172	0.207	0.240	0.280	0.329	0.374	0.426	0.462	0.486	0.501
Turn	4.327	4.998	6.089	7.151	8.191	9.120	10.137	11.011	11.292	10.871
RSI	0.005	0.010	0.016	0.022	0.029	0.035	0.039	0.038	0.035	0.025
# Observations	16,344	16,079	15,768	15,180	14,615	14,132	13,351	12,268	11,048	9,579

Panel A2. Conglomerates

Size	Small	2	3	4	5	6	7	8	9	Big
# Analysts	1.1	1.4	1.7	2.0	2.4	2.8	3.4	4.3	6.0	10.1
# Specialists SIC2	0.6	0.7	1.0	1.2	1.6	1.9	2.4	3.2	4.7	8.6
# Specialists SIC3	0.4	0.5	0.7	1.0	1.2	1.5	1.9	2.7	4.0	7.6
% of Specialists SIC2	0.508	0.482	0.542	0.561	0.580	0.628	0.637	0.696	0.740	0.819
% of Specialists SIC3	0.367	0.377	0.402	0.420	0.415	0.463	0.498	0.570	0.608	0.711
Forecast Dispersion	0.507	0.435	0.459	0.389	0.388	0.409	0.250	0.250	0.207	0.133
Forecast Error	1.257	1.087	1.152	0.958	0.848	0.717	0.704	0.534	0.471	0.341
Segment Disclosure Quality	0.200	0.198	0.196	0.197	0.195	0.196	0.199	0.203	0.203	0.203
IO	0.170	0.206	0.234	0.277	0.340	0.394	0.438	0.455	0.475	0.495
Turn	4.184	4.453	5.259	6.451	7.273	8.064	8.569	9.000	9.054	8.556
RSI	0.005	0.008	0.015	0.022	0.028	0.031	0.032	0.031	0.025	0.018
# Observations	2,792	3,115	3,437	4,009	4,570	5,083	5,849	6,926	8,157	9,573

Table 2 - continued

Panel B. Information Environment of Single-Segment firms and Conglomerates: The Role of Size Matching

Panel B1. No Matching

	Conglo	Single	diff	t-stat
# Analysts	5.4	4.7	0.7	*(5.28)*
# Specialists (SIC2)	4.3	4.0	0.3	*(2.41)*
# Specialists (SIC3)	3.6	3.6	0.1	*(0.74)*
% of Specialists (SIC2)	0.70	0.77	-0.07	*(-12.63)*
% of Specialists (SIC3)	0.57	0.66	-0.09	*(-14.45)*
Forecast Dispersion	0.24	0.25	-0.01	*(-1.10)*
Forecast Error	0.59	0.63	-0.04	*(-1.88)*
Segment Disclosure Quality	0.20	0.35	-0.15	*(-3.60)*
IO	0.41	0.37	0.04	*(12.65)*
Turn	7.44	8.04	-0.60	*(-2.29)*
RSI	0.02	0.02	-0.00	*(-6.14)*

Panel B2. Size Matching

	Conglo	Single	diff	t-stat
# Analysts	5.4	6.6	-1.2	*(-7.53)*
# Specialists (SIC2)	4.3	5.8	-1.5	*(-10.01)*
# Specialists (SIC3)	3.6	5.2	-1.6	*(-11.06)*
% of Specialists (SIC2)	0.70	0.81	-0.12	*(-12.42)*
% of Specialists (SIC3)	0.57	0.71	-0.15	*(-14.46)*
Forecast Dispersion	0.24	0.18	0.06	*(3.24)*
Forecast Error	0.59	0.50	0.09	*(3.29)*
Segment Disclosure Quality	0.20	0.35	-0.15	*(-3.54)*
IO	0.41	0.41	0.00	*(0.40)*
Turn	7.44	8.87	-1.43	*(-3.99)*
RSI	0.02	0.03	-0.00	*(-9.02)*

Panel C. Information Environment of Single-Segment firms and Conglomerates: Regression Analyses

log(1 + # Analysts)	1	Forecast Error	2	IO	3	Turn	4	RSI	5
Intercept	0.132	Intercept	0.555	Intercept	9.809	Intercept	-3.819	Intercept	1.313
	(4.07)		*(9.03)*		*(3.13)*		*(-3.40)*		*(3.20)*
Conglo	-0.124	Conglo	0.056	Conglo	-3.337	Conglo	-1.824	Conglo	-0.387
	(-12.96)		*(3.01)*		*(-3.79)*		*(-5.57)*		*(-3.14)*
Size	0.264	Size	-0.078	Age	-0.050	Age	0.011	Beta	0.022
	(71.27)		*(-12.81)*		*(-3.06)*		*(2.13)*		*(8.57)*
Nasdaq	0.077	Rdsales	-0.022	Div	0.233	Beta	0.039	IO	0.036
	(6.84)		*(-5.56)*		*(6.34)*		*(11.76)*		*(7.03)*
BM	-0.243	Lev	0.490	Size	0.071	MB	0.050	Ret_{t-1}	-0.001
	(-24.45)		*(9.77)*		*(2.08)*		*(8.77)*		*(-0.68)*
Beta	0.069	Intan	-0.166	Mom1	0.019	Size	0.064	MB	0.030

Table 2 - continued

t-stat	*(12.56)*		*(-2.63)*		*(2.40)*		*(5.13)*		*(11.42)*
1/P	-0.088	**Vol**	1.614	**Mom4**	-0.026	**Mlev**	0.009	**Size**	-0.037
t-stat	*(-4.88)*		*(10.13)*		*(-3.08)*		*(1.43)*		*(-5.03)*
Vol	-0.817			**Prc**	0.316	**# Analysts**	0.085	**Mom**	-0.010
t-stat	*(-10.06)*				*(13.10)*		*(6.97)*		*(-5.64)*
Ret	-0.006			**Snp**	0.664	**Prc**	-0.030	**Prc**	0.006
t-stat	*(-1.76)*				*(0.45)*		*(-3.00)*		*(1.39)*
Ret_{t-1}	0.018					**Retn**	-0.026		
t-stat	*(5.72)*						*(-4.22)*		
Turn	0.109					**Retp**	0.053		
t-stat	*(32.56)*						*(3.35)*		

Note: Panel A of this table compares analyst coverage and segment disclosure quality of single-segment firms and conglomerates in ten size decile groups where the same size break-points are used for both single-segment firms and conglomerates. Panel A.1 reports analyst coverage and segment disclosure quality statistics for single-segment firms while Panel A.2 reports these statistics for conglomerates. *# Analysts* measures the total number of analysts covering a firm. *# Specialists SIC2 (# Specialists SIC3)* reports the number of analysts that cover five or more firms in the same industry where industry is defined using the two-digit (three-digit) SIC code. For conglomerates, specialists are defined based on the industry affiliation of the firm's main segment. *% of Specialists SIC2 (% of Specialists SIC3)* reports the percentage of analysts that cover the firm who are specialists using the two-digit (three-digit) SIC code. *Forecast Dispersion* is the standard deviation of all earnings per share (EPS) forecasts, scaled by the absolute value of mean EPS forecasts. *Forecast Error* is the absolute value of the difference between consensus earnings forecast and actual earnings, scaled by actual earnings. *Segment Disclosure Quality* is the firm's average industry-adjusted (at 2-digit SIC code levels) percentage of segment items reported at the end of the fiscal year and is calculated as described in Corporate Diversification and the Cost of Debt: The Role of Segment Disclosures by Franco, Urcan and Vasvari (2015). *RSI* is relative short interest measured by outstanding short position divided by the number of shares outstanding. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. Panel B summarizes analyst coverage statistics for single-segment firms and conglomerates while also reporting the differences for the two groups. Panel B.1 reports differences between conglomerates and size-matched single segment firms, while Panel B.2 reports differences without any size-matching. *Conglo* refers to conglomerates, while *Single* refers to single-segment firms. We report the differences between the two groups using *diff,* while t-statistics are reported below in *Italic* font and in parentheses. The sample period is from January 1984 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. Panel C repeats the analyses in Panels A and B in a regression setting where we control for firm characteristics other than size deemed important by the extant literature in the determination of analyst coverage, institutional ownership, relative short interest as well as turnover. *Nasdaq* is a Nasdaq dummy variable. *Beta* is the CAPM market beta in the past 60 months. *1/P* is one divided by the year-end stock price. *Vol* is the standard deviation of daily stock returns over the fiscal year. *Ret* is the annual stock return of the current year, and Ret_{t-1} measures the annual stock return of the previous year. *Rdsales* is the ratio of R&D expense to sales. *Lev* is the book leverage measured by total liabilities divided by total assets. *Intan* is the log of one plus the ratio of intangible assets to total assets. *Age* is the firm age. *Div* is the dividend payout ratio. *Mom1* is the cumulative return in the past three months, and *Mom4* is the cumulative return between month -4 and month -12. *Prc* is the stock price. *Snp* is the membership in the S&P500 index dummy variable. *MB* is the market-to-book ratio. *Mlev* is the market leverage. *Retp* (*Retn*) is the positive (negative) return in the previous quarter which equals to the return if it is positive (negative), zero otherwise. *Mom* is the cumulative return between month -2 and month -12.

Table 3
Impact of Firm Complexity on Post-Earnings-Announcement Drift

	1	2	3	4	5	6	7
SUE	0.118	0.095	0.127	0.099	0.127	0.051	0.078
	(4.98)	*(4.17)*	*(3.37)*	*(4.36)*	*(3.34)*	*(1.63)*	*(1.79)*
SUE*BM			-0.027		-0.019		-0.025
			(-1.27)		*(-0.94)*		*(-1.19)*
SUE*Size			-0.013		-0.013		-0.014
			(-0.98)		*(-1.02)*		*(-1.16)*
SUE*Conglo		0.084	0.105				
		(2.61)	*(3.32)*				
SUE*Comp				0.184	0.217		
				(2.73)	*(3.45)*		
SUE*Nseg						0.048	0.054
						(2.56)	*(2.88)*
# Observations	248,261	248,261	248,261	248,261	248,261	248,261	248,261

Note: This table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the 60 trading days (one-quarter) following earnings announcements (CAR(2;60)) on earnings surprise, *SUE*, and its interaction with measures of firm (business) complexity. *Conglo* is the conglomerate dummy, equal to 1 if the firm is a conglomerate and 0 otherwise. Conglomerates are defined as firms with more than one business segment. Firm complexity, *Comp*, is 1-HHI, where HHI is the Herfindahl index computed using segment sales within a conglomerate: for each segment, we compute the amount of sales generated by that segment as a fraction of the total sales of the firm and add up the squared fractions to compute HHI. *Nseg* is the number of segments the firm has. Segments are counted as distinct business units if they can be assigned to different two-digit SIC industries. Definitions of size (*Size*) and book-to-market ratio (*BM*) are in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. For brevity coefficients on *BM, Size, Conglo, Comp* and *Nseg* are not reported in this table although we control for *BM and Size* in all regressions and we control for *Conglo, Comp* and *Nseg* wherever it is relevant.

Table 4
Delayed Response Reaction for Single-segment Firms versus Conglomerates

Panel A. PEAD in Extreme Deciles

	CAR(-1;1)	**CAR(2;60)**
SUETop	0.033	0.011
	(26.51)	*(3.19)*
SUETop*BM	0.002	0.008
	(2.06)	*(2.62)*
SUETop*Size	-0.001	-0.001
	(-5.52)	*(-1.75)*
SUETop*Conglo	0.000	0.008
	(0.23)	*(1.89)*
# Observations	49,542	49,542

Panel B. Delayed Response Ratio

	Single	**Conglo**	**Diff**
Delayed Response Ratio	0.310	0.424	0.114
	(8.90)	*(12.22)*	*(2.33)*
# Observations	49,542	49,542	

Note: Panel A of this table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the three days around earnings announcements, CAR(-1;+1) and in the post-announcement window, CAR(+2;+60), on the top decile dummy (*SUETop*) and on its interaction with the conglomerate dummy (*Conglo*) as well as with size, and book-to-market. In Panel A, we also control for *Conglo*, *Size*, and *BM* but for brevity we do not report the coefficients on these firm characteristics. SUETop is 1 for the top *SUE* decile and 0 for the bottom *SUE* decile and helps capture hedge returns to going long on the highest SUE decile and going short on the lowest SUE decile (all other firms are dropped from the sample). The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. Panel B uses the results in Panel A to estimate what fraction of information in earnings announcement is incorporated into the prices outside of the earnings announcement window. Specifically we calculate the ratio of the drift return, CAR(+2,+60), to the total earnings reaction return, CAR(-1,+60), to measure the delayed response ratio for single-segment firms and conglomerates, respectively, and calculate the difference in the delayed response for these two groups of firms for extreme positive (negative) surprise earnings deciles. *Conglo* is the conglomerate dummy, equal to 1 if the firm is a conglomerate and 0 otherwise. Conglomerates are defined as firms with more than one business segment. The z-statistics are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*.

Table 5
How Long Does Firm Complexity Impact PEAD?

Panel A. Conglomerate Dummy

	CAR(2;60)	CAR(2;20)	CAR(21;40)	CAR(41;60)
SUE	0.127	0.041	0.049	0.041
	(3.37)	*(2.34)*	*(2.97)*	*(1.92)*
SUE*BM	-0.027	-0.014	0.002	-0.016
	(-1.27)	*(-1.00)*	*(0.17)*	*(-1.08)*
SUE*Size	-0.013	0.000	-0.006	-0.008
	(-0.98)	*(0.00)*	*(-0.84)*	*(-0.86)*
SUE*Conglo	0.105	0.035	0.046	0.024
	(3.32)	*(2.06)*	*(2.25)*	*(1.11)*
# Observations	248,261	248,258	248,170	244,050

Panel B. Complexity

	CAR(2;60)	CAR(2;20)	CAR(21;40)	CAR(41;60)
SUE	0.127	0.039	0.048	0.043
	(3.34)	*(2.32)*	*(2.96)*	*(1.89)*
SUE*BM	-0.019	-0.011	0.004	-0.014
	(-0.94)	*(-0.79)*	*(0.35)*	*(-0.96)*
SUE*Size	-0.013	0.000	-0.006	-0.009
	(-1.02)	*(0.07)*	*(-0.77)*	*(-1.00)*
SUE*Comp	0.217	0.064	0.119	0.032
	(3.45)	*(1.50)*	*(2.74)*	*(0.67)*
# Observations	248,261	248,258	248,170	244,050

Panel C. Number of Segments

	CAR(2;60)	CAR(2;20)	CAR(21;40)	CAR(41;60)
SUE	0.078	0.013	0.035	0.034
	(1.79)	*(0.75)*	*(1.70)*	*(1.18)*
SUE*BM	-0.025	-0.015	0.003	-0.014
	(-1.19)	*(-1.07)*	*(0.27)*	*(-0.96)*
SUE*Size	-0.014	-0.001	-0.006	-0.008
	(-1.16)	*(-0.19)*	*(-0.82)*	*(-0.89)*
SUE*Nseg	0.054	0.025	0.019	0.010
	(2.88)	*(3.19)*	*(1.86)*	*(0.83)*
# Observations	248,261	248,258	248,170	244,050

Note: This table presents results of regressions of CAR on SUE, alternative measures of firm (business) complexity, and the interactions of SUE with various complexity measures (Conglo, Comp, Nseg). CAR(N;M) is size and book-to-market adjusted cumulative daily return between the Nth and Mth trading days after each earnings announcement. Complexity variables are described in the header of Table 2 and in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. We also control for *Conglo*, *Comp*, *Nseg*, *Size*, and *BM* themselves but for brevity we do not report the coefficients on these firm characteristics.

Table 6
Post-Earnings-Announcement Drift and Changes in Firm Complexity

Panel A. PEAD and New Conglomerates

	1	2	3
SUE	0.085	0.086	0.087
	(3.19)	*(3.27)*	*(3.26)*
SUE*BM	-0.008	-0.010	-0.011
	(-0.42)	*(-0.51)*	*(-0.60)*
SUE*Size	-0.018	-0.019	-0.018
	(-1.57)	*(-1.71)*	*(-1.61)*
Conglo	-0.002	-0.002	-0.002
	(-0.76)	*(-0.86)*	*(-0.78)*
NewConglo	-0.004	-0.002	-0.004
	(-1.73)	*(-0.84)*	*(-1.29)*
SUE*Conglo	0.106	0.119	0.094
	(3.00)	*(3.41)*	*(2.90)*
SUE*New	0.143		
	(1.85)		
SUE*M&A		0.046	
		(0.41)	
SUE*NoM&A			0.601
			(1.85)
# Observations	236,979	236,979	236,979

Panel B. PEAD and New Segments

	1	2	3
SUE	0.034	0.033	0.045
	(0.89)	*(0.88)*	*(1.28)*
SUE*BM	-0.009	-0.010	-0.009
	(-0.47)	*(-0.53)*	*(-0.47)*
SUE*Size	-0.018	-0.022	-0.019
	(-1.80)	*(-2.06)*	*(-1.76)*
NSeg	0.000	0.000	0.000
	(-0.27)	*(-0.48)*	*(-0.31)*
SegInc	-0.003	-0.001	-0.005
	(-1.70)	*(-0.53)*	*(-2.22)*
SUE*NSeg	0.057	0.061	0.047
	(2.57)	*(2.83)*	*(2.42)*
SUE*SegInc	0.063		
	(1.16)		
SUE*M&A		0.046	
		(0.76)	
SUE*NoM&A			0.199
			(1.73)
	236,979	236,979	236,979

Note: This table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the 60 trading days (one-quarter) following earnings announcements (CAR(2;60)) on earnings surprise (SUE), interaction of SUE with alternative measures of firm complexity (Conglo and NSeg), as well as the interaction of SUE with a dummy variable for newly created conglomerates (NewConglo, Panel A) or a dummy variable for increase in the number of segments (SegInc). NewConglo (SegInc) is one for two years after a firm reports an increase in the number of segments and zero otherwise. Both NewConglo and SegInc are set to zero for all single-segment firms. SUE*M&A (SUE*NoM&A) is the interaction of SUE with NewConglo / SegInc for segment increases that can be attributed to diversifying M&A activity (that cannot be attributed to diversifying M&A activity). Definitions for all other firm characteristics are in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. We control for *Size* and *BM* in all regressions as well as M&A and NoM&A dummies wherever it is relevant, but for brevity we do not report the coefficients on these firm characteristics.

Table 7

Impact of Dispersion in Segment Growth Rates on Post Earnings Announcement Drift

Conglomerates Only Sample		
	1	**2**
SUE	0.146	0.141
	(2.50)	*(2.35)*
SUE*BM	-0.019	-0.014
	(-0.34)	*(-0.26)*
SUE*Size	-0.000	-0.000
	(-0.70)	*(-0.75)*
SUE*HTSD	0.200	
	(1.89)	
SUE*LogHTSD		0.304
		(2.12)
# Observations	64,405	64,405

Note: This table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the 60 trading days (one-quarter) following earnings announcements (CAR(2;60)) on earnings surprise, SUE, and its interaction with HTSD, a theoretical construct proposed by Hirshleifer and Teoh (2003), which captures the level of dispersion in segment growth rates with respect to the aggregate growth rate of the firm. HTSD is the Hirshleifer and Teoh (2003) segment growth dispersion measure computed using segment sales and growth rates within a conglomerate: for each segment, we compute the deviation of its growth rate from the firm's aggregate growth rate and square it, we then value weight all segment deviation squared values by the amount of sales generated by that segment as a fraction of the total sales of the firm and add up all the squared segment deviation values weighed by corresponding sales share values to calculate HTSD. LogHTSD is the natural logarithm of one plus HTSD. Segments are counted as distinct business units if they can be assigned to different two-digit SIC industries. Definitions of size (Size) and book-to-market ratio (BM) are in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in Italic font and in parentheses. The sample period is from January 1978 to December 2011. The one-year lag in the sample is necessary in order to calculate segment and firm growth rates. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as # Observations. For brevity coefficients on BM, Size, HTSD and LogHTSD are not reported in this table although we control for BM and Size in all regressions and we control for HTSD and LogHTSD wherever it is relevant.

Table 8
Robustness: Controlling for Potential Spillover from Industry-wide Information Events on PEAD

	1	2	3	4
SUE	0.106	0.088	0.087	0.040
	(3.86)	*(3.18)*	*(3.18)*	*(1.07)*
PCRet	0.056	0.058	0.055	0.055
	(1.89)	*(1.95)*	*(1.86)*	*(1.84)*
PCRet*Conglo	0.003	-0.012	-0.001	-0.003
	(0.13)	*(-0.52)*	*(-0.05)*	*(-0.13)*
SUE*BM	-0.001	-0.009	-0.001	-0.008
	(-0.02)	*(-0.41)*	*(-0.05)*	*(-0.37)*
SUE*Size	-0.002	-0.002	-0.002	-0.002
	(-1.19)	*(-1.69)*	*(-1.80)*	*(-1.89)*
SUE*Conglo		0.103		
		(3.24)		
SUE*Comp			0.214	
			(3.35)	
SUE*Nseg				0.054
				(2.77)
# Observations	233,298	233,298	233,298	233,298

Note: This table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the 60 trading days (one-quarter) following earnings announcements (CAR(2;60)) on earnings surprise (SUE), interaction of *SUE* with *Conglo* (*Comp* / *Nseg*), interaction of *SUE* with the recurring control variables, as well as *Conglo* (*Comp* / *Nseg*) and the usual control variables themselves (the latter slopes are not tabulated). Furthermore, we also control for the impact of industry-wide information events, estimated via pseudo-conglomerate returns (*PCRet*), in all columns. *PCRet* is calculated one month before the earnings announcement. To compute *PCRet*, we first compute equal-weighted returns to all single-segment firms in an industry (industries are defined based on the two-digit SIC codes). For a single-segment firm, *PCRet* is calculated as the return to other single-segment firms in its two-digit SIC industry. For conglomerates, industry returns for affiliated segments are weighed by the respective sales shares of the business segments and the weighted average is referred to as *PCRet*. Complexity variables are described in the header of Table 2 and in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. We control for *Size* and *BM* in all regressions as well as *Conglo*, *Comp* and *Nseg* wherever it is relevant but for brevity we do not report the coefficients on these firm characteristics.

Table 9
Robustness: Controlling for Alternative Explanations of PEAD

	1	2	3	4	5	6	7	8	9	10
SUE	0.127	0.142	0.085	0.051	0.806	0.066	0.173	0.135	0.174	1.050
	(3.37)	*(3.10)*	*(2.03)*	*(1.54)*	*(2.24)*	*(0.60)*	*(1.32)*	*(2.96)*	*(3.38)*	*(1.28)*
SUE*BM	-0.027	-0.045	-0.053	0.002	-0.006	0.044	0.065	-0.033	-0.029	0.222
	(-1.27)	*(-1.84)*	*(-2.25)*	*(0.09)*	*(-0.19)*	*(0.38)*	*(0.55)*	*(-1.34)*	*(-1.27)*	*(1.02)*
SUE*Size	-0.013	-0.001	-0.001	0.000	0.000	-0.004	-0.004	0.000	0.000	0.000
	(-0.98)	*(-0.86)*	*(-0.94)*	*(-0.4)*	*(-0.26)*	*(-2.08)*	*(-2.19)*	*(-0.19)*	*(0.11)*	*(0.00)*
SUE*Conglo	0.105	0.083	0.087	0.127	0.127	0.211	0.209	0.108	0.097	0.332
	(3.32)	*(2.48)*	*(2.65)*	*(2.01)*	*(2.05)*	*(2.50)*	*(2.44)*	*(2.91)*	*(2.54)*	*(3.12)*
SUE*EP			0.252							-0.068
			(2.87)							*(-0.20)*
SUE*FOG					-0.038					-0.053
					(-2.08)					*(-1.32)*
SUE*DRESP							-0.276			-0.160
							(-1.06)			*(-1.51)*
SUE*EarnVol									-0.068	-0.034
									(-2.16)	*(-0.31)*
# Observations	248,261	181,023	181,023	113,100	113,100	84,970	84,970	229,174	229,174	49,513

Note: This table presents quarterly Fama-MacBeth regressions of size and book-to-market adjusted cumulative returns in the 60 trading days (one-quarter) following earnings announcements (CAR(2;60)) on earnings surprise (SUE), interaction of SUE with the conglomerate dummy and interaction of SUE with control variables, as well as the conglomerate dummy and the control variables themselves (the latter slopes are not tabulated). The control variables include size, book-to-market (BM), time-varying earnings persistence (EP) a la Chen (2013), textual complexity (FOG) a la Li (2008), analyst responsiveness (DRESP), and earnings volatility (EarnVol). Detailed definitions of all control variables are in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. We control for *Size* and *BM* in all regressions as well as *Conglo*, *EP, FOG, DRESP* and *EarnVol* wherever it is appropriate but for brevity we do not report the coefficients on these firm characteristics.

Table 10
Robustness: Accounting for Non-Linearity in SUE and Using Alternative CAR Measures in PEAD Regressions

	Carhart Alphas			Winsorized SUE			SUE as Decile Rank		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
SUE	0.137	0.135	0.085	0.467	0.465	0.375	0.086	0.085	0.082
	(3.24)	*(3.38)*	*(1.85)*	*(4.27)*	*(4.41)*	*(3.10)*	*(9.56)*	*(9.39)*	*(9.06)*
SUE*BM	-0.048	-0.042	-0.048	0.027	0.041	0.033	-0.006	-0.005	-0.006
	(-2.05)	*(-1.84)*	*(-2.05)*	*(0.34)*	*(0.51)*	*(0.41)*	*(-1.45)*	*(-1.27)*	*(-1.42)*
SUE*Size	-0.003	-0.003	-0.003	-0.008	-0.007	-0.008	-0.009	-0.009	-0.009
	(-1.65)	*(-1.71)*	*(-1.88)*	*(-3.12)*	*(-3.05)*	*(-3.36)*	*(-7.51)*	*(-7.41)*	*(-7.57)*
SUE*Conglo	0.099			0.171			0.006		
	(3.12)			*(2.68)*			*(1.79)*		
SUE*Comp		0.229			0.399			0.016	
		(3.41)			*(2.70)*			*(2.06)*	
SUE*Nseg			0.055			0.094			0.004
			(3.12)			*(3.02)*			*(2.50)*
# Observations	248,261	248,261	248,261	248,261	248,261	248,261	248,261	248,261	248,261

Note: This table presents quarterly Fama-MacBeth regressions of firm-specific Carhart alphas in the 60 trading days (one-quarter) following earnings announcements $\alpha_C(2;60)$) on earnings surprise (*SUE*), interactions of *SUE* with the measures of firm complexity (*Conglo*, *Comp* and *Nseg*) and with standard controls (*Size* and *BM*). Columns one to three use the baseline definition of *SUE* (winsorized at 99.5% and 0.5% percentile), columns four to six winsorize *SUE* at 95% and 5% percentile, columns seven to nine transform *SUE* into decile ranks. Detailed definitions of all variables are in the Data Appendix. The t-statistics use Newey-West (1987) correction for heteroscedasticity and autocorrelation and are reported below each coefficient in *Italic* font and in parentheses. The sample period is from January 1977 to December 2010. The sample excludes firms with market caps in the lowest NYSE/AMEX size quintile. The number of firm-quarters used in the analyses is abbreviated as *# Observations*. We control for *Size* and *BM* in all regressions as well as *Conglo*, *Comp,* and *Nseg* wherever it is appropriate but for brevity we do not report the coefficients on these firm characteristics.