Product Integration and Merger Success

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ABSTRACT

We examine the importance of firm integration to the outcomes of mergers and acquisitions using new product-based ex ante measures of product integration within the firm at the firm and firm-pair level. Our ex ante measures are significantly associated with ex post statements by managers in their 10-K indicating difficulties with merger and acquisition integration and also employee retention issues. We find that firms performing mergers and acquisitions in markets with high product integration difficulty experience lower ex post profitability, higher ex post expenses, and a higher propensity to divest assets. Upon announcement, acquirers experience lower announcement returns and targets experience significantly higher announcement returns when ex ante product integration gaps are high. Examining long-term stock market returns, we find that the anomaly that acquiring firms have lower longer-term stock returns primarily occurs for firms with high integration gaps, high cash balances and low growth options.

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I Introduction

Participants engaging in mergers frequently claim that merger integration problems are a major reason why many mergers do not succeed. A recent survey of more than 800 executives by McGee, Thomas, and Thomson (2015) cites different cultures and difficulty of integrating product lines as partially being responsible for worse ex post merger outcomes and a lower chance of achieving merger synergies. Ahern, Daminelli, and Fracassi (2015) examine international mergers and find that country-level cultural difference in trust and individualism lead to lower merger volumes and lower combined abnormal announcement returns. Yet, currently there is only limited evidence other than case studies[1] that problems with product and firm integration are important for merger outcomes at the deal level within countries. It is not just a lack of resources to implement merger integration that causes many mergers to fail. In fact, Harford (1999) shows that acquisitions by cash rich acquirers are often followed by declines in operating performance.

We define merger integration difficulty as the possibility that there will be value loss from attempting to coordinate activities and product line offerings to achieve synergies from previously separate organizations. Rhodes-Kropf and Robinson (2008) model asset complementarity and synergies as a motive for mergers but do not consider the problems and risks associated with achieving these synergies. Bena and Li (2014) show that innovation increases for targets and acquirers that have similar technological links from patents - evidence consistent with ex post innovation synergies. Hoberg and Phillips (2010) establish that similar targets and acquirers have higher ex post cash flows and more new product introductions. However, despite this evidence of ex post merger gains, we do not know what factors give rise to risks of potentially not fully achieving the synergies that managers frequently cite as the rationale for mergers and acquisitions.

We focus on measuring the ex ante difficulty of integrating product lines across organizations at the firm level for mergers within the U.S. We use text-based analysis of firm 10-K business descriptions using single-segment firms to measure this quantity,

[1] Arnold (1983) examines 5 cases studies of merger integration and Epstein (2004) examines the merger of J.P. Morgan and Chase Manhattan Bank.

which measures the extent to which merging firms will face challenges integrating their various product lines in the post merger firm. Although the concept of product integration difficulty might seem narrow relative to a more classic view of integration difficulties, which is often linked to employees leaving the firm due to difficult work environments and problems of integration of different firm cultures, for example, we propose that these issues are linked. That is, the more there is ex ante difficulty of integrating merging firms' products, the more employees of the two firms will have to work together and thus the more important are employee retention and culture issues for these deals.

Our empirical results support this proposition. When our ex ante measures of product integration difficulty are high, we observe a higher ex post incidence of managers discussing both integration difficulties and employee retention. These findings are consistent with product integration difficulties translating to increased likelihood of unexpected drains on managerial time and in retaining employees.

Examining outcomes after mergers and acquisitions, we also find evidence that ex ante measures of potential product integration difficulties are associated with lower operating income post-merger and higher ex post SG&A/sales, which specifically relates to the cost of managing the firm's employees and organizations. We also find evidence that mergers and acquisitions with higher ex ante product integration difficulties experience higher ex post asset divestitures. These results are found using just firms that report producing only in single industries as we exclude diversified conglomerate firms. Overall, these findings illustrate the importance of product integration and its real impact on acquiring firms.

One example of managers discussing integration difficulties in their 10-K (in a different section than the product description section) is Integrated Health Services in 1997:

> *"IHS has recently completed several major acquisitions, ..., and is still in the process of integrating those acquired businesses. The IHS Board of Directors and senior management of IHS face a significant challenge in their efforts to integrate the acquired businesses, including First American, RoTech, CCA, the Coram Lithotripsy Division and the facilities and other businesses acquired from HealthSouth. The dedication of management resources to such integration may detract attention from the day-to-day business of IHS. The difficulties of*

integration may be increased by the necessity of coordinating geographically separated organizations, integrating personnel with disparate business backgrounds and combining different corporate cultures."

In all, we find that over 19% of all firms in our sample make ex post statements like the one above in their 10-K. Such statements typically appear in sections of the 10-K other than the business description (for example in the MD&A or in the discussion of risk factors). We view such statements as an indicator of ex post integration difficulties, and the existence of such statements allows us to assess the validity of our ex ante measures of potential product integration difficulties. We note that measuring integration difficulties ex ante is far more difficult than identifying cases of failure ex post. For example, it is perhaps not clear to managers themselves how risky a transaction truly is, and the post-merger firm is not observable ex ante, making it difficult to forecast the difficulties that might arise.

We measure ex ante potential product integration difficulties using individual words and the paragraph structure of the product market descriptions (in the business description section) of firm 10-Ks. We define a perfectly integrated word as one that is equally likely to appear in any paragraph in the given firm's 10-K business description. This atomistic word-level approach allows us to view any real or hypothetical firm as a collection of building blocks (words). A firm is thus in a market that requires extensive product integration if the words the firm uses in its business descriptions appear uniformly integrated across the paragraphs in this business summary. This approach allows us to compute levels of integration for individual firms, for hypothetical counterfactual firms, and even for hypothetical post-merger firms that do not yet exist. For example, we can compute integration levels for the target, the acquirer, and the part of the post merger firm that reflects newly anticipated product market synergies. In this paper, we focus on understanding integration differences of firms that produce only in a single industry and exclude firms that produce in multiple industries.

The intuition behind this approach can be seen if we consider the following generative process for business descriptions after a merger. Suppose that the instantaneous effect of merging two firms together (without any initial integration) can be char-

acterized by simply appending the text of the target's business description to that of the acquirer. At this point, the text associated with both firms, while in the same document, is disjoint and unintegrated. As the firm proceeds to integrates, the product text from the two parts then becomes mixed. As a result, words from the target's vocabulary effectively move in the document into the paragraphs that previously just discussed the acquirer's products (and vice-a-versa). When this is successfully achieved, the result is an integrated firm.

An example of an unintegrated firm is Harris Teeter, a firm operating in the grocery business. Unlike Apple, whose products share many features that were deliberately built into the products as the firm evolved, such is not typical in the grocery business, where goods are purchased from producers with little or no modification by Harris Teeter itself. As a result, its expected baseline level of integration in its business description is likely to be low. Such a firm faces less risk of integration failure because its products and lines of business are easier to separate.

Our first finding regarding outcomes is that proposed mergers and acquisitions are more likely to be withdrawn when the ex ante gap between expected integration and realized firm integration is high. Moreover, both sides of the gap calculation matter: deals are less likely to be withdrawn when ex ante realized firm integration is high, and are more likely to be withdrawn when expected integration of rival firms is high. This test supports the hypothesis that many deals are canceled when parties raise opposition to them. These results also support the conclusion that our measures indeed capture ex ante integration difficulties.

For firms that do complete the announced deal, we observe lower ex post profits and higher selling and general administration (SG&A) expenses when the acquirer is ex ante less integrated and has a higher integration gap. These results are consistent with the acquiring firm having to spend additional resources and compensate employees to integrate the firms. We also document that our ex ante measures of potential product integration difficulties are associated with a higher rate of ex post divestiture of assets, consistent with difficulties in integrating firms with high ex ante product integration difficulty.

We find that acquirers have modestly negative announcement returns and targets have large positive announcement returns when expected product integration difficulty from potential product synergies is high. We find that product integration difficulties relating specifically to synergies are most responsible for these announcement returns, and to subsequent negative real outcomes. This conclusion is based on using the integration properties word-by-word and by considering word-pair combinations that only exist in post-merger firms but not in pre-merger targets or acquirers. Our results are consistent with targets receiving high announcement returns when integration difficulties are high to compensate agents affiliated with the target for the taking on the risk and providing the requisite effort to successfully integrate the firms.

Examining stock market longer-term outcomes, we show that ex post negative stock returns to acquiring firms can be explained by ex ante product integration difficulties and that the well-known anomaly of negative stock returns to acquiring firms only exists in the subsample of mergers and acquisitions where integration difficulties are high. These results are also robust to controlling for product similarity as measured by Hoberg and Phillips (2010), which captures potential synergies between merging firms. We conclude that our ex ante measure of product integration difficulties is distinct and separate from measures of product similarity.

Our paper adds to previous research on mergers which examines ex post outcomes after mergers. Healy, Palepu, and Ruback (1992) and Andrade, Mitchell, and Stafford (2001) document increases in industry-adjusted cash flows following mergers. Maksimovic and Phillips (2001) document increases in productivity after mergers that are related to demand shocks and acquirer skill. Rhodes-Kropf and Robinson (2008) model asset complementarity and synergies as a motive for mergers. Bena and Li (2014) and Hoberg and Phillips (2010) document evidence of synergies post merger, showing that there are increases in cash flows, new products and patents post merger that are related to ex ante similarity of acquirer and target.

However, these studies do not shed light on the difficulties of merger integration even for related firms. Our paper measures and captures ex ante merger integration difficulty that results from product integration. We directly show that ex ante poten-

tial product integration difficulty is related to merger success in a domestic context. This adds product integration difficulties to the list of international cultural integration difficulties that have been shown to impact mergers documented in Ahern, Daminelli, and Fracassi (2015).

The rest of this paper is organized as follows. Section II discusses our data and method for measuring ex ante product integration difficulties. Section III provides tests which validate that our ex ante measure of product integration difficulty is correlated with ex post managerial discussions of problems with merger integration and employee retention. Section IV provides our tests examining the relation between ex ante measures of product integration difficulties and M&A announcement returns. Section V examines ex post real outcomes and section VII examines ex post stock returns. Section VII concludes.

II Firm Integration and Transaction Integration

A key objective of the methods used in our paper is to examine ex ante expected levels of integration failure for any candidate merger pair (even if the target and the acquirer have not yet merged). This presents two challenges. First, we do not observe the post-merger firm until later, and we have to rely on ex ante available information. Second, a post merger firm is more than the sum of its parts. Generally, a post merger firm has three parts: acquirer assets in place, target assets in place, and synergies and assets created from the business combination. Ideally, our measures of ex ante integration difficulty will be capable of assessing integration difficulties for each component. We predict that the difficulty of integration is more salient for the synergy components of mergers than for the assets in place. In particular, synergies likely draw strongly on the product market expertise of both firms and thus are more dependent on integration before they can be realized.

Our initial methodology is based on measuring the ex ante integration difficulties associated with each existing firm's assets in place. This can be computed for all public firms, even those not involved in a transaction. We then extend our methodology to compute the ex ante integration difficulty of firms involved in transactions.

This approach can separately assess assets in place and potential synergies of the transacting firms. This flexibility is achieved by first defining the concept of integration at the atomistic word level, and then by computing integration difficulty for any firm (or parts of a transacting firm) by averaging the integration of its atomistic parts (the words associated with each part's business description vocabulary). This general framework not only allows us to explore integration specifically for merger transactions as in the current research, but it also provides a foundation for computing ex ante integration difficulty in other corporate settings. Examples of such future research might include divestitures, IPOs, new ventures, or even proposed early-stage business plans that can benefit from pre-implementation ex ante measurable information on integration. In all cases, the integration properties of each such project can be computed by linking each project's product market text to the word-specific integration difficulty scores computed from the general population of public firm 10-Ks.

Before explaining the specific calculations used for measuring the potential for integration difficulty, we first discuss the conceptual foundation for the empirical measures. Our measures capture three different concepts: 1.) Firm realized integration, 2.) Firm expected integration and 3.) Transaction or synergy integration difficulties.

A The Integration Gap: Expected versus Actual Integration

Central to our analysis is the ability to measure a firm's level of potential for integration success relative to a strong counterfactual or benchmark. A key issue is that, in some product markets such as agriculture, overall integration levels are low. In this setting, a firm that achieves an average level of realized integration relative to economy-wide averages can be viewed as quite successful. In contrast, in markets where integration levels are high, such as medical devices and services, a firm that achieves an average level of integration relative to economy-wide averages can be viewed as a laggard given expectations should be higher in such markets. This issue is particularly important when we assess longer-term integration success.

We assess each firm's integration success by comparing its realized integration to an appropriate counterfactual level of expected integration. We define a firm's "integration gap" as the difference between a firm's expected and its realized integration as follows (specific formulas and methods are in the next section):

$$\text{Integration Gap}_{i,t} = \text{Expected Integration}_{i,t} - \text{Actual Integration}_{i,t} \quad (1)$$

A firm with a high integration gap has a realized level of integration that is low relative to its expected counterfactual level of expected integration. We might expect that such firms are failing to fully integrate their acquired product offerings, and are thus more likely to experience negative outcomes when they acquire. In particular, firms with a larger integration gap might realize lower profits, higher administrative costs in the form of SG&A, higher rates of ex post divestiture, and lower ex post stock returns if they acquire other firms.

Figure 1 provides four illustrative examples of firm realized integration levels over time (with the specifics of how we calculate these integration levels in the next section). For example, Apple's integration initially declined around 2002 as the firm began to retool itself from a PC maker into a firm that ultimately would offer a well-integrated array of products including smart phones and tablets and laptops among other offerings. The figure shows that over the period of a decade, Apple's integration gradually soared and it became one of the highly integrated firms in the economy despite the apparent complexity of its products. The figure illustrates that successful integration is likely the result of ongoing investment over time. Apple's new products are not only innovative, but are also well-integrated as they share many common features, presumably relating to internet, software, casings, screen technology and other aspects. The figure also shows that Google has traversed a similar path since its IPO in 2004.

Whirlpool is an example of a firm that was able to integrate its products far earlier and has maintained one of the highest levels of integration during our sample. In contrast, and not surprisingly, Berkshire Hathaway is among the least integrated firms in our sample. Critically, Berkshire acts more as a investment-driven holding

company and its objective is not to integrate its business lines. Hence we view the observed lower level of integration of Berkshire to be an indirect validation of our measures. We provide more formal tests of validation in section IV.

[Insert Figure 1 Here]

III Methodology and Data

A Methodology: Measuring Integration Using Words

We now discuss in more detail how we use individual words to measure integration. Consider a firm i that has a business description with N_i paragraphs. Further let L_i denote the number of words in each paragraph. We define the firm's distribution of paragraph lengths as the following N_i-vector $D_{i,full}$ (where $\mathbb{1}$ is a vector of ones):

$$D_{i,full} = \frac{L_i}{L_i \cdot \mathbb{1}}. \tag{2}$$

Let k denote a given word and let $D_{i,k}$ denote the N_i-vector distribution of word k's usage in the N_i paragraphs for firm i. For example, a word that appears in just one paragraph would have a vector $D_{k,i}$ that is zero in all elements and one in the row corresponding to that paragraph. A firm that uses a word twice in one paragraph and once in another would have a vector $D_{i,k}$ that contains all zeros, except one element would contain two-thirds and one element would contain one third.

Individual words that appear with a frequency of occurrence across paragraphs that matches this aggregate frequency would be deemed to be "fully integrated". In contrast, words having a distribution that is highly dissimilar to the aggregate distribution are "disintegrated". The primitive concept driving our approach is that a word is integrated if it appears somewhat "uniformly" across the firms' paragraphs. A word that appears only in a cluster of paragraphs but otherwise is not mentioned is a relatively disintegrated word. Visual examples of distributions of integrated and non-integrated words are depicted in Figure 2.

[Insert Figure 2 Here]

We thus define word k's realized integration for firm i ($IW_{i,k}$) as the distributional

proximity of word k's usage to firm i's aggregate usage distribution of word paragraph lengths:

$$IW_{i,k} = \frac{D_{i,k}}{||D_{i,k}||} \cdot \frac{D_{i,full}}{||D_{i,full}||} \tag{3}$$

We note that $IW_{i,k}$ can be computed fully from firm i's 10-K. We thus define this construct as a measure of "realized integration", as it is the observed level of integration for word k in firm i's 10-K in the given year (note that all variables in this section have an implied t subscript for the given year, which we omit for parsimony).

In addition to realized integration levels, we also compute levels of benchmark "expected integration" for each word k and firm i. This is done by simply computing the average of $IW_{j,k}$ across all single segment firms j such that $j \neq i$ such that firm j uses word k in its 10-K. We base this calculation on single segment firms only because integration computed for conglomerates measures integration both at the product level but also integration related to the firm's more complex organizational structure. Expected integration is thus a quantity that is also unique for each firm i and word k, and we denote expected integration as $\overline{IW_{i,k}}$ whereas realized integration is $IW_{i,k}$. Expected integration indicates the extent to which word k normally appears as an integrated word across firms in the economy that use word k. Therefore, it serves as a natural benchmark to which realized integration can be compared. For example, we propose that a given firm has an integration shortfall if the words it uses generally have low levels of realized integration and high levels of expected integration. This concept will be important when we later introduce firm-level measures.

B Measuring Firm-level Integration

We now describe how we compute firm-level actual and expected integration levels for any firm in isolation, regardless of whether the given firm is experiencing or has experienced a transaction. The main intuition is that we compute integration levels at the word-level for each firm in the previous section. Firm-level integration is simply the weighted average integration of the words it uses in its 10-K business description. In our main results, we focus just on firms producing only in single industries. We exclude diversified conglomerate firms based on firms having two or more segments

on the COMPUSTAT Business segment tapes. We focus on single industry firms to emphasize that the integration differences we find are not just relevant for diversified conglomerate firms. In robustness, we include diversified conglomerate firms and find similar results.

We define I_i for firm i as a Q-vector where each element k contains each word's level of realized integration $IW_{i,k}$, which we defined in equation (3). Q denotes the number of unique words in the sample of all firms in a given year. Firm realized integration is then computed by averaging the realized integration of the words the firm uses as follows:

$$Actual\ Integration_i = V_i \cdot I_i \tag{4}$$

where V_i is a Q-vector that contains the relative frequency each word k is used by firm i in its overall business description section of its 10-K. In particular, V_i indicates the density of words used, and hence satisfies $V_i \cdot 1 = 1$. As a result, equation 4 intuitively defines firm integration as a simple weighted average of individual word-specific integration levels.

We next consider firm "expected integration", which is computed in a parallel fashion as realized integration, except that it is based on expected word-level integration ($\overline{IW_{i,k}}$) instead of realized word-level integration ($IW_{i,k}$). We thus define $\overline{I_i}$ for firm i as a Q-vector where each element k contains each word's level of expected integration $\overline{IW_{i,k}}$ (as defined in the previous section). Firm expected integration is thus the average expected integration of the words the firm uses as follows:

$$Expected\ Integration_i = V_i \cdot \overline{I_i} \tag{5}$$

We emphasize that both realized and expected integration are not highly correlated with measures of similarity or competitiveness such as those used in Hoberg and Phillips (2016). This is by design, as the concept of integration has a different foundation than does competitiveness or the concept of across-firm relatedness. In particular, firm integration is a property of the paragraph structure and its distributional properties *within* a firm (measuring the degree to which words are mixed), and is not a property of how similar a firm's disclosure is to other firms.

From the expected and actual integration levels, we then can compute a firm's integration gap as:

$$Integration\ Gap_{i,t} = Expected\ Integration_{i,t} - Actual\ Integration_{i,t} \quad (6)$$

C Measuring Synergy Integration Risk

To measure synergy integration difficulty on actual or proposed merger transactions, we consider words that are likely to appear in a post-merger firm that are not currently present in either the pre-merger acquirer or target. In order to do so, for each transaction, we first identify the ten other firms (i.e. selected from the universe of publicly traded firms in the given year excluding the given target and the acquirer) that are most proximate to the vocabulary in the target's and the acquirer's 10-K. This is done using the pairwise similarities from Hoberg and Phillips (2016). For a given acquirer firm "a", target firm "t", and a given other firm j, let $S_{j,a}$ and $S_{j,t}$ be firm j's produce market similarity to "a" and "t" respectively, where similarity is based on the cosine similarity between each firm pair's 10-K business description.

We then sort all public firms "j" (again excluding the acquirer and target) based on the product of the two similarities ($S_{j,a}S_{j,t}$). We take the top ten firms with the highest product for each acquisition. Firms scoring highly by this metric contain significant amounts of vocabulary overlap with the acquirer and with the target. To compute synergy integration risk, we now define Q_j for each firm j as the frequency vector of words used by the given firm j that are *not* used by either the acquirer or the target (normalized to sum to one). These words, given revealed association with the acquirer and target vocabularies, likely identify the product market words that will associate with the synergies of the given merger-pair acquisition. They are specifically synergy words because they, by construction, are not currently in the vocabulary of either the acquirer or the target, and yet they are likely to appear if the given acquirer and target are combined. We thus compute expected synergy integration for the given merger pair as predicted by a single firm j as the following weighted average:

$$Expected\ Synergy\ Integration_{a,t,j} = Q_j \cdot \overline{I_i} \quad (7)$$

We then average this quantity over the top ten firms j based on the sort above to obtain Expected Synergy Integration$_{a,t}$ (now without the j subscript). This is an estimate of the expected level of integration needed to be comparable to existing firms in the synergy product market. The synergy integration gap is the expected synergy integration of the merger pair less the weighted average actual firm integration of the acquirer and target as follows (where M_a and M_t are the market capitalizations of the acquirer and target, respectively):

$$Synergy\ Integration\ Gap_{a,t} = Expected\ Synergy\ Integration_{a,t} \tag{8}$$
$$- \ [\frac{M_a}{M_a + M_t} Actual\ Integration_a + \frac{M_t}{M_a + M_t} Actual\ Integration_t]$$

This quantity is carefully constructed to be fully measurable for any candidate pair of firms even before they actually merge. Our central prediction is that merger pairs facing a high ex ante synergy integration gap are more likely to face integration failure ex-post if they do merge. If markets are at least partially efficient informationally, we also expect more negative announcement returns when the given pair announces a merger.

The reason why the synergy integration gap can be calculated in full even before a candidate merger is consummated is because it is a function of only pre-merger 10-K business descriptions, along with the pre-merger business descriptions of other firms operating in markets related to the intersection of the two merging firms. The ability to estimate synergy integration failure even before a merger is consummated makes the measure particularly useful as a potential tool for evaluating integration difficulty for candidate mergers at the time of proposal or evaluation. We are not aware of any existing measures that have this important property.

D Data

We begin with Compustat firms with fiscal years ending in 1996 to 2015. We then identify, extract, and parse machine readable 10-K annual firm business descriptions from the SEC Edgar database. We thus require that firms have machine readable filings of the following types on the SEC Edgar database: "10-K," "10-K405," "10-

KSB," or "10-KSB40." These 10-Ks are merged with the Compustat database using using the central index key (CIK) mapping to gvkey provided in the WRDS SEC Analytics package. These minimum criteria leave us with a baseline panel database of 122,951 observations in our merged Compustat/Edgar universe. Following Hoberg and Phillips (2016), we only consider words that are nouns or proper nouns, and we only include words that appear in no more than 25% of all 10-Ks in the given year. We also drop any words that appear in less than three 10-Ks to reduce the size of our underlying data matrices and because these words are not highly informative about integration due to their scarcity.

We also use metaHeuristica to access other parts of the 10-K. In particular, we use metaHeuristica to identify managerial mentions of integration difficulties and employee retention issues in the 10-K, which we discuss more in the next section.

We identify merger and acquisition of asset transactions using SDC Platinum. We obtain 74,600 announced transactions where the acquirer is in our merged Compustat/Edgar universe and 34,916 announced transactions in which the target is in this universe. When we restrict this sample to single segment firms (as we do for our main tests), these numbers are 46,587 and 19,910, respectively. We use these samples to examine stock returns and long-term real outcomes following acquisition transactions. We also identify a smaller subsample with available lagged machine readable 10-Ks available for both the target and the acquirer, available linked CRSP data for both target and acquirer, and adequate coverage to compute control variables. This sample is used to examine announcement returns, and it contains 7,381 transactions, 3,248 of which are transactions between a target and acquirer that are both single segment firms (our main sample).

We use the CRSP database for two purposes. First, we use the daily return tapes to compute the announcement returns for both targets and acquirers. Second, we use the monthly CRSP return tapes to construct a database of monthly stock returns that we use to test our predictions regarding the negative ex post acquirer stock return anomaly. After merging the monthly stock return database our with the standard Davis, Fama, and French (2000) and momentum controls, and our merged Compustat/Edgar universe, we are left with 781,645 monthly stock return

observations from July 1997 to December of 2015. 562,636 observations remain for single segment firms, which we present in our main sample.

We note that in all tests that follow, we report results based on our sample of single segment firms only. We limit the sample in this way because our measures of integration risk are most easily interpreted for single segment firms. However, we also note that all our results are robust to including conglomerates in our sample. We rerun all tests using this combined sample of single segment firms and conglomerate firms and we report the results in the online appendix to this paper.

IV Statistics and Validation

Table I displays the summary statistics for the key variables considered in our study. Panel A reports summary statistics for firm-level variables based on 10-K business descriptions and also for control variables. Although the mean values for realized and expected integration do not have a simple interpretation, the table shows that both variables have similar means. Expected integration has roughly half the standard deviation, reflecting the fact that it is based on average levels of word-by-word integration, which are less noisy. Hence it is not surprising that their difference, the integration gap, has a mean that is close to zero and that spans both positive and negative values. A negative value indicates firms whose realized integration is low relative to benchmark levels implied by other firms using similar vocabularies.

Panel B of Table I reports the mean value of the dummy variables we compute based on verbal statements in the 10-K indicating integration difficulties surrounding mergers (integration challenges dummy) and employee retention issues surrounding mergers (employee retention dummy). We explain the construction of these variables in the next Section. Here we note that 37.9% of firms in our sample disclose direct statements indicating concerns about risks of failed merger integration, and 20.6% disclose statements indicating employee retention issues surrounding acquisition transactions. These results indicate that potential integration difficulty is salient for a large number of firms in our sample, as they discuss this issue directly in their 10-K. Finally, Panel C reports the summary statistics for our variables based

on real outcomes, including profitability, SG&A expenses, and post merger rates of divestiture and acquisition.

[Insert Table I Here]

Table II displays the Pearson correlation coefficients. The table shows that, not surprisingly, realized and expected levels of integration are positively correlated at 64.6%. This indicates that when firms operate in markets where high integration is the norm, they usually are able to generate a realized level of integration that is also quite high. However, there is also material differences in the information in these variables. For example, realized integration is lower for larger and older firms, and also for firms facing more competition in the form of total product similarity. In contrast, expected levels of integration do not strongly correlate with these variables.

We also consider the integration gap, which is the difference between expected and realized integration. A high value indicates that a firm's realized integration is low relative to its benchmark, which in turn should be an indicator of integration failure following a merger. In rows (5) and (6), we thus report correlations between our key variables and dummy variables indicating whether managers directly indicate challenges with merger integration in their 10-K (these variables are formally explained in the next section). We find that the integration gap, as we would predict, is positively correlated with these variables. In particular, when a firm's level of integration is low relative to its benchmark, managers are more likely to report that the firm is facing difficulties in integrating its business lines following a merger. The results also suggest that the integration gap is positively correlated with managerial statements about challenges regarding employee retention, a matter that is also fundamentally related to integration challenges.

[Insert Table II Here]

Table III displays sample industries based on the Fama-French 12 classification and average levels of realized and expected integration.[2] We report results both in the first year of our study (1997) and the last year (2015). The results suggest that for many of these broad industry classifications, that average realized integration is

[2]We thank Ken French for providing classification data on his website.

generally in a band between 0.4 and 0.5. The health industry has materially lower average levels of integration at 0.409 in 1997, which drops further to 0.360 by 2015. Shops and durables have higher levels of integration near 0.50. Comparing realized to expected integration, we observe similar patterns. Also, comparing 2015 in Panel B to 1997 in Panel A, we only observe modest shifts in the industry rankings.

[Insert Table III Here]

A Managerial Mentions of Integration Difficulties

We use 10-K text to identify instances where managers explicitly indicate that they are facing difficulties with merger integration, and also instances where they are facing challenges with employee retention issues. We use these measures primarily for validation of our aforementioned measures of ex ante integration difficulty based on business descriptions. We also use these managerial mention measures to further illustrate the importance of integration to managers. For example, we noted earlier that 37.9% of firm 10-Ks contain a direct statement about integration challenges, and moreover, these statements are detailed and specific, and hence are not boilerplate. We utilize this richness in a second test to further illustrate which specific issues related to integration are most salient for the firms in our sample. We specifically examine issues relating operational integration, product integration, technological integration, employees, managerial distraction, and timing delays.

To identify managerial mentions, we use the metaHeuristica software package and run queries on the entire 10-K - thus we use content in 10-Ks that is distinct from the firm's business description (which we use to construct our aforementioned measures of ex ante integration risk). The majority of managerial mentions relating to integration challenges are in the managerial discussion and analysis (MD&A) and risk factor sections of the 10-K. Our objective is to use the results of this query for validation, and in particular, to examine if our ex ante measures of integration difficulty based on product descriptions indeed predict ex post instances of managers explicitly complaining about integration difficulties. Strong evidence regarding this prediction would mitigate concerns that our ex ante measures based on distributional

mixture and product market vocabulary primitives are measuring something other than integration.

In order to identify firms that complain about integration difficulties, we run a metaHeuristica query requiring that one word from each of the following three buckets must all jointly appear in a paragraph. We use word buckets that contain an array of synonyms because there is a number of ways to express to a reader that the firm is experiencing integration difficulties. We identified the synonyms to use in these queries using the sentence tree views in metaHeuristica following Hoberg and Maksimovic (2015).

Integration Difficulty List 1: merger OR mergers OR merged OR acquisition OR acquisitions OR acquired

Integration Difficulty List 2: integration OR integrate OR integrating

Integration Difficulty List 3: challenge OR challenging OR difficulties OR difficulty OR inability OR failure OR unsuccessful OR substantial expense

If a given firm has a hit on this query, we define the "Integration Failure Dummy" to be one. We also compuate an "Integration Failure Intensity" variable as the total number of words in the paragraphs of firms that hit on this query.

We run a separate query also based on three word buckets to identify whether a firm is experiencing issues relating to employee retention. The buckets are as follows:

Employee Retention List 1: merger OR mergers OR merged OR acquisition OR acquisitions OR acquired

Employee Retention List 2: employee OR employees OR personnel

Employee Retention List 3: retention OR departure OR departures

If a given firm has a hit on this query, we define the "Employee Retention Dummy" to be one. We also compute an analogous variable "Employee Retention Intensity" based on word counts. We identify all firms with these discussions of merger integration problems and employee retention issues and then create the resulting dummy and continuous intensity measures for each firm.

Table IV presents examples of the first ten paragraphs returned from metaHeuristica in 1997 that hit on our verbal query intended to measure managerial mentions of integration difficulties, where we query metaHeuristica using the word list searches discussed above. The identification of a relevant paragraph requires that at least one word from each of the three integration difficulty buckets discussing acquisitions and integration problems appears in a paragraph. The examples clearly indicate specific mergers being discussed and integration problems with these mergers. We also note that these discussions appear ex post, after the acquisitions have taken place.

[Insert Table IV Here]

Table V shows similar examples where we use the text searches to identify employee retention issues discussed in the context of mergers. Quotes include statements like "Such merger-related costs, ..., include change in control payments and severance and retention bonuses for management and employees of the merged entity ..."

[Insert Table V Here]

We now regress these merger integration and employee discussion variables on our ex ante measures of merger integration risk. Table VI presents the results. We include control variables for size, age, overall textual similarity to rivals, Tobin's q, and document length. All regressions also include industry and year fixed effects with standard errors clustered by industry.

[Insert Table VI Here]

The results in Panel A of Table VI show that firms are more likely to mention integration problems when expected integration is high. If the firm has a high level of ex ante realized firm integration, they mention integration failure problems ex post

less often. More importantly, we consider our composite measure "Integration Gap," which is the difference between expected integration and realized firm integration. This measure is positively related to mentions of integration problems. Panel B shows tha that this variable is also positively related to employee retention issues. Hence firms with a larger ex ante integration gap, indicating that their realized level of integration falls short of their expected level, experience more ex post managerial discussions of merger integration failure and employee retention issues.

Overall, these results validate that our measures of product integration based on the uniformity of word distributions across paragraphs are indeed picking up integration gaps. Our integration measures are calculated using product description text, whereas our test measures of integration difficulties and employee retention issues are specific statements about risk exposures and outcomes, and are not rooted in product market discussions. Hence, these tests strongly support the conclusion that our ex ante measures of integration difficulty do predict observed instances of integration failure being discussed directly in the firm's ex-post disclosure, which is a key result motivating the use of our variables as valid measures of ex ante integration risk.

As noted earlier, these managerial discussions of integration failures are highly detailed. Hence, we examine which specific ex-post integration failures are most likely to appear when our ex ante measures of integration gap are higher. We specifically examine issues relating operational integration, product integration, technological integration, employees, managerial distraction, and timing delays. To examine this issue, we first restrict our sample to firm-years that (A) were an acquirer in year t and (B) have a paragraph where they discuss integration failure, as described above. This screen reflects that our goal is to uniquely examine which specific ex-post integration failure issues are discussed conditional on discussing integration problems. This specification further allows us to test which discussions are most likely when our ex ante measures of integration gap are high.

We define the following new dummy variables also using the metaHeuristica program. The operations dummy is one if the paragraph describing the firm's integration failure issue also contains one of the following words indicating that failures

were related to operational issues: operations, operation, operated, or operational. The products dummy is one if, analogously, at least one of the following words is present: product, products, customer, customers, consumers, or demand. Technological failures are defined analogously based on the following words: technological, technology, technologies, information, systems or system. Employee issue failures are defined analogously based on the following words: personnel, employee, employees, labor or workers. Management failures are defined analogously based on the following words: management, managements, manage, distract, devote, coordination ,divert, diversion, or disrupt. Time/delay failures are defined analogously based on the following words: timely, delay or delays. We consider these dummies in regressions in which these dummy variables are the dependent variable. key independent variables are realized integration, expected integration, the integration gap, and our set of control variables including document length. All regressions are based on linear probability models and include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

[Insert Table VII Here]

The results are displayed in Table VII. Reassuringly, row (4) shows that the integration gap variable most strongly predicts issues with product integration. This is quite remarkable given that our ex ante measure was based on product market vocabulary in a different part of the 10-K. We also find strong support that our measures specifically predict integration failures relating to managerial distractions, employees and to some extent, technology. In contrast, we find that the link to operational failures and timing delays are insignificant. We thus conclude that ex ante measures of product market integration intuitively predict ex-post failures most related to product market issues and issues with human capital integration.

V Withdrawn Acquisitions

Before examining outcomes of mergers with high integration risk, we first examine if announced mergers are more likely to be canceled if realized integration is low and the gap between expected and realized integration is high. This test is based on the

premise that many deals are canceled when parties raise opposition to them.

Table VIII reports the results of regressions in which the dependent variable is a measure of withdrawn transactions. In Panel A, one observation is one firm in one year, and the dependent variable is the fraction of a given firm's announced transactions in the given year that were withdrawn. A firm-year observation is only included in the regression if the firm had at least one announced acquisition in the given year. In Panel B, we consider a larger panel database in which one observation is one announced transaction, and the dependent variable is a dummy that is equal to one if the transaction was withdrawn. The key independent variables are realized integration, expected integration, and the integration gap variables. We also include controls for size, age, TNIC total similarity, and Tobins Q. All regressions include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

[Insert Table VIII Here]

Inspection of Table VIII reveals that proposed mergers and acquisitions are more likely to be withdrawn when the gap between expected integration and realized ex ante firm integration is high. These results hold both at the firm-year level in Panel A and at the deal level in Panel B. In addition, when rivals and targets are similar, as measured by TNIC similarity, deals are less likely to be withdrawn. Highly valued acquirers are also less likely to withdraw deals. Overall the results support the conclusion that our measure of the integration gap captures ex ante information that firms and market participants are using to assess the potential success of acquisitions. When the integration gap is high, deals are more likely to be withdrawn.

VI Ex-Post Real Outcomes

We now examine the relationship between post-merger real outcomes and ex ante integration risk. We examine the ex post change in operating income and also the ex post change in operating costs (SG&A). Lastly, we examine if firms with high potential integration difficulty are more likely to divest assets ex post.

Table IX reports the results of OLS regressions in which the dependent variable is a measure of ex post operating income to assets and SG&A to sales. As our goal is to examine ex post outcomes for acquirers, we limit the sample to firms that were an acquirer in year t. We consider outcomes measured as changes for both a one-year horizon and a three-year horizon, where the horizon begins in year t of the merger and ends in year $t+1$ or $t+3$. We consider the following outcomes: ex post changes operating income scaled by assets and expenses captured by ex post changes in SG&A /sales. All regressions include industry and year fixed effects and all right-hand-side variables are standardized prior to running regressions for ease of interpretation.

[Insert Table IX Here]

Inspection of the results in Table IX reveal that ex-post operating income is significantly lower for firms with high ex ante merger integration gaps. We also find that operating expenses as captured by SG&A are higher when there is a higher ex ante integration gap.

In particular, rows 2 and 4 show that operating income is 4.7 to 5.7% lower for acquirers with a 1 standard deviation higher expected integration risk. Analogously, rows (6) and (8) indicate that SG&A increases by 4.8% to 6.5% when the ex ante integration gap is high. The interpretation of the integration gap is very intuitive. When the ex ante difference between the expected integration and actual integration is high for the acquirer, it indicates that the firm's realized integration is below the expected levels achieved by other firms operating in markets using similar vocabularies. Our hypothesis is that such a firm is less likely to realize the full potential of its M&A activity, and we thus predict worse outcomes. The aforementioned results are significant at the 1% level and strongly support this conclusion.

Table X examines whether post-merger divestitures, acquisitions, and net acquisitions (acquisitions minus divestitures) are related to ex ante merger integration risk. We consider regressions of these measures of ex post restructuring on our ex ante measures of merger integration risk. We also include controls for size, age, target fraction of acquirer, market to book and also text-based similarity measures from

Hoberg and Phillips (2010), which have been shown to impact mergers.

[Insert Table X Here]

Table X reveals that divestitures in the year after the merger increase when there is a higher ex ante merger integration gap. We also find that acquisitions decrease. These results are generally significant at the 5% level, but are stronger and are significant at the 1% level for net acquisitions. All of the integration variables are measured before the transaction, thus providing evidence that ex ante shortcomings in integration are associated with subsequent divestitures.

VII Stock Market Returns

Given we have documented outcomes differ on the real side, we turn to an examination of the impact of ex ante integration difficulty in the stock market. We examine whether merger integration difficulty relating to the assets in place, and also specifically relating to the likely synergies, induce lower stock market returns. We examine both announcement returns and also longer term ex post stock returns.

A Announcement Returns

We first examine stock market announcement returns. We regress stock market announcement returns on our measures of potential merger integration difficulty and synergy integration risk. We include both our measure of synergy integration gap and and separate measures of integration gap for the assets in place of the acquirer and target. We also consider our measure of synergy uniqueness. We consider announcement returns measured just on day $t = 0$, and also a 3-day window, where all windows are centered around $t = 0$. Announcement returns are market-adjusted. We include control variables for size, age, the fraction of the acquirer the target represented, the firm market to book, text-based similarity variables based on Hoberg and Phillips (2010), and document size.

The key independent variables of interest are the Synergy Integration Gap, and the Target and Acquirer Integration Gaps. These measures are computed as follows.

The synergy integration gap was defined earlier in equation (8) and is based on expected integration of the words used by other firms in the economy that are likely to appear in the post merger firm's synergy vocabulary. The acquirer and target integration gaps are the standard variables defined in equation (6) computed for each of the two firms, respectively. The resulting measures of integration difficulty are ex ante measurable and target specific parts of the post merger firm based on assets in place and likely synergies.

[Insert Table XI Here]

Table XI shows that the M&A announcement returns for acquirers and targets are significantly related to the synergy integration gap and the synergy uniqueness, but they are not significantly related to integration risks associated with assets in place. This is consistent with integration failure being most salient for synergies, as synergy cashflows do not exist in the pre-merger firms and therefore must be realized by first integrating aspects of the target and acquirer.

Panel A shows that when the synergy integration gap is high, the announcement return of the combined firm is significantly lower for the three day horizon. This is consistent with the market realizing, at least partially, that the possibility of integration failure is higher for these deals. The fact that the results are only significant for the 3 day horizon and not the one day horizon suggests that the market needs at least some time to process the likelihood of integration failure, which is generally perceived as difficult to forecast.

Panel B shows that this overall negative reaction for the combined firm is mostly attributed to lower target premia, as the synergy integration gap predicts lower target announcement returns, especially at the 3 day horizon. As the all independent variables are standardized prior to running the regression, the coefficient of -0.011 for the synergy integration gap indicates that target announcement returns are 1.1% lower on average when the synergy integration gap increases by one standard deviation. These results are economically meaningful in addition to being statistically significant. The result for the combined firm, however, is materially smaller at -0.3% due to the fact that the acquirer is usually significantly larger than the target.

Panel C shows that the acquirer does not underperform, at least at the time of announcement. The synergy integration gap is not statistically different from zero and is slightly positive. We document later that longer-term stock returns are significantly lower for these acquirers. Hence these results support the conclusion that the market does not adequately price the information associated with integration risks at the time of announcement. This is consistent with a form of underreaction or informational inefficiency in this market.

Panels B and C additionally show that acquirers have higher announcement returns, and targets have lower announcement returns, when the likely synergies are more unique. Although the drivers of this result are not perfectly clear and full assessment of this finding is outside the scope of our study, it is potentially consistent with the acquirer earning at least some rents relating to the innovativeness of their proposed mergers.

Finally, we also observe in Panel A that the total combined firm announcement return is positively related to the pairwise similarity of the target and the acquirer, a result that is significant at the 1% level. These results are related to those in Hoberg and Phillips (2010). Including controls for the variables in that study also illustrate that our new measures of merger integration are distinct from firm pairwise similarities. This finding is not surprising because, as we pointed out earlier, it is by construction given our focus on within-firm integration using word frequency distributions across paragraphs within each firm.

B Ex Post Long-run Stock Returns

In this section, we explore the extent to which ex ante measures of integration are associated with the ex post stock returns of acquiring firms. This issue of the stock returns to acquiring firms is important and has been studied by Asquith (1983), Aggarwal, Jaffe, and Mandelker (1992), Fama (1998), Loughran and Vijh (1997) and Mitchell and Stafford (2000). These studies show that acquiring firms underperform in the years after an acquisition. Our study extends this work and we examine the extent to which acquiring firms with higher levels of ex ante integration difficulty

experience lower stock returns than do acquirers with lower levels of integration risk. Evidence supporting this link can further explain why some acquiring firms underperform, as market participants might not have full information about the extent of integration difficulty and its potential adverse affect on acquiring firms.

C Asset Pricing Variables

We consider monthly excess stock returns as our dependent variable. Our primary independent variables of interest include ex ante realized integration, expected integration, and the integration gap. In particular, we consider interactions of these variables with an acquisition dummy. Our acquisition dummy is set to one when a firm has a completed acquisition as indicated by the SDC Platinum database. The dummy is set to one during the one year period starting six months after the acquisition date and is otherwise set to zero. The use of a six month lag is to maintain consistency with our other variables, and also to reflect the fact that integration failure likely materializes after the firm has had ample time to attempt to properly integrate the acquired division. This allows us to examine if the well known anomaly that acquiring firms underperform can be explained by integration failure, and also allows us to more broadly examine the cross sectional role of merger integration failure in explaining monthly stock returns.

We also include controls for size, book to market and momentum. We construct size and book to market ratio variables following Davis, Fama, and French (2000) and Fama and French (1992). Market size is the natural log of the CRSP market cap. Following the lag convention in the literature, we use size variables from each June, and apply them to the monthly panel to use to predict returns in the following one year interval from July to June.

The book-to-market ratio is based on CRSP and Compustat variables. The numerator, the book value of equity, is based on the accounting variables from fiscal years ending in each calendar year (see Davis, Fama, and French (2000)) for details). We divide each book value of equity by the CRSP market value of equity prevailing at the end of December of the given calendar year. We then compute the log book to

market ratio as the natural log of the book value of equity from Compustat divided by the CRSP market value of equity. Following standard lags used in the literature, this value is then applied to the monthly panel to predict returns for the one year window beginning in July of the following year until June one year later.

For each firm, we compute our momentum variable as the stock return during the eleven month period beginning in month $t-12$ relative to the given monthly observation to be predicted, and ending in month $t-2$. This lag structure that avoids month $t-1$ is intended to avoid contamination from microstructure effects, such as the well-known one-month reversal effect.

After requiring that adequate data exist to compute our integration variables and the aforementioned asset pricing control variables, and requiring valid return data in CRSP, our final sample has 781,645 observations.

D Fama MacBeth Regressions

Table XII displays the results of monthly Fama and MacBeth (1973) regressions in which the dependent variable is the monthly excess stock return. Row (1) shows our baseline model, where do not include any integration variables. We note that the book to market and momentum variables are not significant in our sample. The result for momentum is primarily due to the fact that our sample includes the financial crisis, a period during which momentum is known to strongly under perform. We also find in our sample that the acquisition dummy is negative but is not quite significant. The weak results for book to market and the acquisition dummy likely relate to the relatively short nature of our sample. We also note that the acquisition dummy is significant in the earlier half of our sample (not reported), indicating that this unconditional anomaly was smaller in the most recent years. Remarkably, despite the relatively short sample, we do find significant results for the merger integration gap variable.

To reduce any impact from multicollinearity given our use of cross terms, we consider a dummy variable approach. For each integration variable, we compute a dummy that is set to one when the given firm has a value for the given integration

variable that is in the highest tercile in the given year.

[Insert Table XII Here]

Our most important result appears in row (5), where we observe that the high merger integration gap dummy is negative and significant at the 5% level for firms that did recent acquisitions (Acquirer x High Integration Gap). Because we standardize our independent variables prior to running the regression, the coefficient of -0.194 indicates a one standard deviation shift in this variable is associated with a 19 basis point per month shift in the firm's stock return. This is 2.3% annualized. Because the integration gap variable is only significant when the firm was also an acquirer, but it is not unconditionally negative, we conclude that the negative performance we find is unique to mergers with high ex ante integration difficulty and hence the poor performance is consistent with ex-post integration failure. This conclusion is further supported by the poor real-side performance we reported earlier, and also our earlier validation tests showing that these firms are also more likely to disclose direct statements of integration failure in their 10-Ks.

The other rows show that this finding for the integration gap is more driven by firms having low realized integration than it is by firms having higher expected integration. One potential concern with the regressions in Table XII is potential multicollinearity. We further rule out this possibility when we consider separate quintile regressions later in this section where cross terms are not necessary.

In rows (6) and (7), we repeat the key regressions in rows (4) and (5) with two additional variables. The first is the fraction of consideration paid in the acquisition that is in the form of stock. The second is a dummy that is one when the form of consideration is not available, as the consideration variables are frequently missing in SDC Platinum. This allows us to retain the full sample and we set the missing values for the first variable to zero as their impact is then absorbed by the dummy. The objective of these tests is to examine if our results are robust to the findings of Loughran and Vijh (1997), who find that longer term stock returns are strongly negative when acquisitions are done using stock. In our setting, the fraction stock variable is indeed negative, although its significance level misses the 10% level with

a t-statistic of -1.33. This is likely due to the fact that our sample is newer than those in existing studies, and our sample is also somewhat limited in time series. Nevertheless, the objective in our case is to simply control for the fraction stock.

We find in rows (6) and (7) that our results are entirely robust to including controls for the form of consideration. Hence, our results are distinct from existing studies.

D.1 Subsample Tests

We now examine two hypotheses that might further explain why managers might pursue transactions in cases where integration difficulties are likely. We test whether managerial agency problems are likely, and whether the lack of growth options can explain why managers still undertake transactions when integration difficulties are likely. Of course, one potential reason why managers might do so is that they are unaware of just how risky a given transaction might be. We cannot directly test that particular hypothesis.

[Insert Table XIII Here]

Table XIII shows that our main result (that acquirers underperform when ex ante integration difficulty is high) is stronger in subsamples where firms have (A) higher cash balances and below median market to book values - indicating less growth options. Row (2) indicates that the Acquirer x High Integration Gap variable is most significant for firms with above-median cash balances. Here the t-statistic is -2.95 and the result is significant at the 1% level. This result is quite strong compared to the diametric-opposite subsample in row (3), where the same variable is very close to zero with a t-statistic of -0.09. We also note that our results are a stronger for firms with a lower M/B ratio ratio as shown in row (5).

Lastly, we report results for conglomerate firm acquiers in row (6). We can see that these firms do not underperform. We do see underperformance when conglomerate firms are combined with single segment firms in row (7). Thus the single-segment firms with high integration gap explain the stock market underperformance.

D.2 Quintile Tests

To further ensure that our cross term tests are not influenced by multicollinearity, and to further explore how the economic magnitude of the integration variables changes as our measure of integration difficulty becomes larger, we next consider quintile subsamples in Table XIV. In particular, we first sort firms in each month into quintiles based on their level of ex ante expected integration gap. For each quintile, we then run Fama MacBeth regressions similar to those in Table XII but with a couple important changes. First, because we form subsamples based on the integration variables, we do not include the integration variable itself in the regression. Instead we focus on the acquisition dummy in each regression. Our prediction is that the acquisition dummy will become increasingly negative as we go from the low integration gap quintile to the high integration gap quintile. We run this test using three samples: the full sample (Panel A), the above-median cash/assets subsample (Panel B) and the below-median cash/assets subsample (Panel C).

[Insert Table XIV Here]

By examining the significance and the economic size of the acquisition dummy coefficient in each quintile, we can then explore the extent of acquirer underperformance in each quintile. We first consider Panel A, which is based on the full sample. We find that the acquisition dummy coefficient is negative but insignificant in row (1) for the lowest integration gap quintile. However, it is negative and highly significant with a t-statistic of -2.49 in the high integration gap quintile. We also note that the economic magnitude of the high quintile coefficient is large at -0.296. This indicates that acquirers facing high integration gaps underperform by 29.6 basis points per month. This is an economically meaningful 2.65% per year.

We find stronger results in Panel B for the subsample of firms with high cash balances. In this case, the acquisition dummy is negative and significant at the 1% level, and the underperformance of acquiring firms increases to an annualized 6.16% per year. This is consistent with Jensen (1986)'s free cash flow agency problem, as it indicates that managers that have excess cash are more willing to do mergers that entail higher levels of integration difficulty and hence poorer performance. Finally,

Panel C displays results for the subsample of firms with low cash balances. Here we observe a less uniform pattern across the quintiles and the highest integration gap quintile firms have an acquisition dummy coefficient that is only significant at the 10% level. The implied annual underperformance of acquirers in this sample is an annualized 1.82% versus the 6.16% we observe in Panel B.

Overall, our results indicate that stock returns are lower among firms that are acquirers when they face higher levels of ex ante integration gap. This finding is stronger for firms that have higher cash balances. We also find that announcement returns are somewhat negatively related to ex ante integration difficulty and that longer-term stock returns are even more negatively related. We conclude that although the market shows some response at the time of announcement, that the market likely does not ex ante fully predict the extent of integration failure among acquirers with high integration risk. However, we also note that we cannot rule out that these findings might be related to a new systematic risk factor. Because our earlier findings indicate that integration difficulty in our setting is likely driven by individual firm managers and their employees, which is likely quite idiosyncratic across firms, we believe that an explanation of our stock returns based on market informational inefficiency or underreaction is most likely. We also note that because we control for standard predictors of stock returns including the book to market ratio and momentum, that existing potential sources of systematic risk also cannot explain our findings.

VIII Conclusions

We examine the importance of potential merger integration difficulty to merger outcomes - both for stock market and real outcomes. Our findings support the view that poor merger outcomes arise in part from the difficulty of integrating the product lines offered by the pre-merger firms and the intended synergies.

We focus on measuring the difficulty of integrating product lines across organizations at the firm level for acquisitions in the U.S. We use text-based analysis of business descriptions in firm 10-Ks to measure ex ante merger integration difficulty

to capture the extent to which merging firms will face challenges integrating their product lines. The measures are general and are based on measuring integration at the atomistic level of individual words or word-pairs. Using our approach we can assess ex ante integration difficulty separately for assets in place and merger synergies. These integration difficulty components can even be computed before a candidate post merger firm is observed.

Validating our approach, we find that when ex ante merger integration difficulty is high, that the post-transaction incidence of managers discussing integration difficulties increases. These discussions are specific and often refer to issues such as drains on managerial time, drains on other corporate resources, or specific failures in integration. These findings are consistent with ex ante product integration risks predicting an increased likelihood of such ex post unexpected drains on managerial time and also in retaining employees.

We document the impact of ex ante integration difficulty throughout the merger process and on ex post outcomes. We find that when ex ante merger integration difficulty is high, proposed deals are more likely to be withdrawn consistent with market participants recognizing that some deals have higher integration costs. For deals that are finalized and are not withdrawn, we find that ex ante merger integration difficulty is associated with lower ex post operating income and higher ex post SG&A/sales, which specifically relates to the cost of managing the firm's employees and organizations. We also find evidence that divestitures are higher when there is higher ex ante product integration risk. These findings illustrate the importance of product integration difficulty and its real impact on acquiring firms. Because our results indicate that integration difficulties poses a greater challenge for synergies than for assets in place, they also highlight the elevated role that synergies play in determining successful instances of merger integration.

Examining the impact in the stock market, we find that ex ante product integration difficulty is associated with lower stock market announcement returns and lower ex post monthly stock returns for the acquirer, and higher announcement returns for the target. The former is consistent with the market only learning the negative consequences of high ex ante integration difficulty over time. These results further

suggest that the longer term underperformance of acquirers can be explained at least in part by integration failure. Although more research is needed to fully understand the higher annoucement return for the target, we note that it is consistent with agents associated with the target demanding a higher premium to compensate them for accepting a transaction that entails high integration risk.

References

Aggarwal, Anup, Jeffrey Jaffe, and Gershon Mandelker, 1992, The post-merger performance of acquiring firms: a reexamination of an anomlay, *Journal of Finance* 47, 1605–1621.

Ahern, Kenneth, Daniele Daminelli, and Cesare Fracassi, 2015, Lost in translation? the effect of cultural values on mergers around the world, *Journal of Financial Economics* 117, 165–189.

Andrade, Gregor, Mark Mitchell, and Erik Stafford, 2001, New evidence and perspectives on mergers, *Journal of Economic Perspectives* 15, 103–120.

Arnold, JD, 1983, Saving corporate marriages: Five cases, *Mergers and Acquisitions* 23, 55–58.

Asquith, Paul, 1983, Merger bids, uncertainty and stockholder returns, *Journal of Financial Economics* 11, 51–83.

Bena, Jan, and Kai Li, 2014, Corporate innovations and mergers and acquisitions, *Journal of Finance* 69, 19231960.

Davis, James, Eugene Fama, and Kenneth French, 2000, Characteristics, covariances, and average returns: 1929-1997, *Journal of Finance* 55, 389–406.

Epstein, Marc, 2004, The drivers of success in post-merger integration, *Organizational dynamics* 33, 174–189.

Fama, Eugene, and Kenneth French, 1992, The cross section of expected stock returns, *Journal of Finance* 47, 427–465.

Fama, Eugene, and J. MacBeth, 1973, Risk, return and equilibrium: Empirical tests, *Journal of Political Economy* 71, 607–636.

Fama, Eugene F., 1998, Market efficiency, long-term returns, and behavioral finance, *Journal of Financial Economics* 49, 283–306.

Harford, Jarrad, 1999, Corporate cash reserves and acquisitions, *Journal of Finance* 54, 1969–1997.

Healy, Paul, Krishna Palepu, and Richard Ruback, 1992, Does corporate performance improve after mergers?, *Journal of Financial Economics* 31, 135–175.

Hoberg, Gerard, and Vojislav Maksimovic, 2015, Redefining financial constraints: a text-based analysis, *Review of Financial Studies* 28, 1312–1352.

Hoberg, Gerard, and Gordon Phillips, 2010, Product market synergies in mergers and acquisitions: A text based analysis, *Review of Financial Studies* 23, 3773–3811.

——— , 2016, Text-based network industry classifications and endogenous product differentiation, *Journal of Political Economy* 124, 1423–1465.

Jensen, Michael, 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323–329.

Loughran, Timothy, and Anand Vijh, 1997, Do long-term shareholders benefit from corporate acquisitions?, *Journal of Finance* 52, 1765–1790.

Maksimovic, Vojislav, and Gordon Phillips, 2001, The market for corporate assets: Who engages in mergers and asset sales and are there efficiency gains?, *Journal of Finance* 56, 2019–2065.

McGee, Tom, Trevear Thomas, and Russell Thomson, 2015, Integration report 2015: Putting the pieces together, available at http://www2.deloitte.com/content/dam/Deloitte/us/Documents/mergers-acqisitions/us-ma-integration-report-030415.PDF.

Mitchell, Mark, and Erik Stafford, 2000, Managerial decisions and long-term stock-price performance, *Journal of Business* 73, 287–329.

Rhodes-Kropf, Matthew, and David Robinson, 2008, The market for mergers and the boundaries of the firm, *Journal of Finance* 63, 1169–1211.

Table I: Summary Statistics

Notes: Summary statistics are reported for our sample of single segment firms from 1996 to 2015. Realized integration is the extent to which a firm's individual words appear in the firm's actual paragraphs in a distribution proportional to observed paragraph word counts. Expected integration is the extent to which a firm uses vocabulary that generally appears in a this proportional distribution across paragraphs in all firms that use the given word in the economy in the given year. The integration gap is expected minus realized integration. TNIC total similarity is the summed TNIC similarity of firms in the given firm's TNIC industry. The integration challenges dummy is one if the firm's 10-K has a paragraph where the firm mentions integration in the context of a discussion about acquirers and along side vocabulary that indicates difficulty. The employee retention dummy is a dummy that is one if the firm mentions employee retention issues in a paragraph that also discusses acquisitions. The profitability and expense variables are based on Compustat data. The change in target (acquirer) rate is the natural logarithm of one plus the number of asset sales (purchases) in year t divided by one plus the number of asset sales (purchases) in year $t-1$.

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
Panel A: Integration Variables and Firm Characteristics					
Firm Integration	0.426	0.105	0.237	0.412	1.000
Expected Integration	0.398	0.052	0.247	0.392	0.586
Integration Gap	-0.028	0.082	-0.718	-0.013	0.153
TNIC Total Similarity	9.405	17.654	1.000	2.676	131.674
Log Assets	6.740	2.079	-2.313	6.742	14.761
Log Age	2.576	0.748	0.693	2.565	4.190
Panel B: Managerial Mentions of Integration Difficulties					
Integration Challenges Dummy	0.379	0.485	0.000	0.000	1.000
Employee Retention Dummy	0.206	0.404	0.000	0.000	1.000
Panel C: ex post Outcome Variables					
Δ OI/Assets	-0.010	0.109	-1.287	-0.001	0.959
Δ SG&A/Sales	-0.009	0.252	-7.650	0.000	3.281
Δ Target Rate	0.035	0.460	-2.833	0.000	2.485
Δ Acquirer Rate	-0.422	0.590	-3.526	-0.693	2.526

Table II: Pearson Correlation Coefficients

Notes: Pearson Correlation Coefficients are reported for our sample of single segment firms from 1996 to 2015. Please see Table I for variable descriptions.

Row	Variable	Realized Integration	Expected Integration	Integration Gap	TNIC Total Similarity	Log Assets	Log Age	Integration Diffic. Dummy
				Correlation Coefficients				
(1)	Expected Integration	0.646						
(2)	Integration Gap	-0.877	-0.200					
(3)	TNIC Total Similarity	-0.159	-0.156	0.106				
(4)	Log Assets	-0.099	-0.148	0.034	0.232			
(5)	Log Age	0.130	0.046	-0.138	-0.053	0.389		
(6)	Integration Challenges Dummy	-0.133	-0.128	0.090	-0.115	0.051	0.006	
(7)	Employee Retention Dummy	-0.075	-0.064	0.055	-0.028	0.086	0.021	0.185

Table III: Integration Across Industries

The table displays the average realized and expected integration for the Fama-French-12 industries in 1997 (Panel A) and 2015 (Panel B). Realized integration is the extent to which a firm's individual words appear within its own paragraphs in a distribution close to a uniform distribution. Expected integration is the extent to which a firm uses vocabulary that generally appears in a uniform distribution across paragraphs in all firms that use the given word in the economy in the given year.

Row	FF12 Industry	Realized Integration	Expected Integration	# Obs.
		Panel A: 1997 Industries		
1	Shops	0.507	0.446	762
2	Durbl	0.501	0.437	181
3	NoDur	0.496	0.448	395
4	Chems	0.493	0.425	143
5	Manuf	0.492	0.428	726
6	Other	0.466	0.415	1018
7	BusEqSv	0.446	0.414	1362
8	Enrgy	0.440	0.410	249
9	Utils	0.435	0.395	170
10	Money	0.425	0.389	1364
11	Telcm	0.415	0.418	212
12	Hlth	0.409	0.398	758
		Panel B: 2015 Industries		
1	Shops	0.503	0.425	309
2	Durbl	0.497	0.414	78
3	NoDur	0.490	0.412	140
4	Manuf	0.474	0.394	320
5	Chems	0.470	0.395	91
6	Utils	0.468	0.397	104
7	Other	0.453	0.394	446
8	BusEqSv	0.449	0.408	629
9	Telcm	0.434	0.421	91
10	Enrgy	0.417	0.396	162
11	Money	0.411	0.378	999
12	Hlth	0.360	0.355	629

Table IV: Sample Managerial Statements of Integration difficulty

The table displays the first ten paragraphs returned from metaHeuristica in 1997 that hit on our verbal query intended to measure managerial measures of integration risk. The query was run using metaHeuristica and requires that one word from each of three buckets must appear in a paragraph. The first bucket is acquisition words: {merger, mergers, merged, acquisition, acquisitions, acquired}. The second bucket is integration words: {integration, integrate, integrating}. The third bucket is an indication of difficulty: {challenge, challenging, difficulties, difficulty, inability, failure, unsuccessful, substantial expense}. The results from this query are then used to compute the integration challenges dummy and the integration challenges intensity variables.

Row	Sample Paragraph
1	**[Integrated Health Services]** IHS has recently completed several major acquisitions, including the acquisitions of First American, RoTech, CCA and the Coram Lithotripsy Division and the Facility Acquisition, and is still in the process of integrating those acquired businesses. The IHS Board of Directors and senior management of IHS face a significant challenge in their efforts to integrate the acquired businesses, including First American, RoTech, CCA, the Coram Lithotripsy Division and the facilities and other businesses acquired from HEALTHSOUTH. The dedication of management resources to such integration may detract attention from the day-to-day business of IHS. The difficulties of integration may be increased by the necessity of coordinating geographically separated organizations, integrating personnel with disparate business backgrounds and combining different corporate cultures.
2	**[Siebel Systems]** The Company has acquired in the past, and may acquire in the future, other products or businesses which are complementary to the Company's business. The integration of products and personnel as a result of any such acquisitions has and will continue to divert the Company's management and other resources. There can be no assurance that difficulties will not arise in integrating such operations, products, personnel or businesses. The failure to successfully integrate such products or operations could have a material adverse effect on the Company's business, financial condition and results of operations.
3	**[Cable Design Technologies]** Although the Company has been successful in integrating previous acquisitions, no assurance can be given that it will continue to be successful in integrating future acquisitions. The integration and consolidation of acquired businesses will require substantial management, financial and other resources and may pose risks with respect to production, customer service and market share. While the Company believes that it has sufficient financial and management resources to accomplish such integration, there can be no assurance in this regard or that the Company will not experience difficulties with customers, personnel or others. In addition, although the Company believes that its acquisitions will enhance the competitive position and business prospects of the Company, there can be no assurance that such benefits will be realized or that any combination will be successful.
4	**[Star Telecommunications]** Additionally, on November 19, 1997, the Company entered into an agreement to acquire UDN. The acquisition of UDN is subject to approval of UDN's stockholders and to various regulatory approvals, and the Company may not complete this acquisition. These acquisitions have placed significant demands on the Company's financial and management resources, as the process for integrating acquired operations presents a significant challenge to the Company's management and may lead to unanticipated costs or a diversion of management's attention from day-to-day operations.
5	**[Sun Healthcare Group]** The integration of the operations of Retirement Care and Contour, to the extent consummated, will require the dedication of management resources which will detract attention from Sun's day-to-day business. The difficulties of integration may be increased by the necessity of coordinating geographically- separated organizations, integrating personnel with disparate business backgrounds and combining different corporate cultures. As part of the RCA and Contour Mergers, Sun is expected to seek to reduce expenses by eliminating duplicative or unnecessary personnel, corporate functions and other expenses.
6	**[Sunquest Information Systems]** management has limited experience in identifying appropriate acquisitions and in integrating products, technologies and businesses into its operations. The evaluation, negotiation and integration of any such acquisition may divert the time, attention and resources of the Company, particularly its management. There can be no assurance that the Company will be able to integrate successfully any acquired products, technologies or businesses into its operations, including its pharmacy systems.
7	**[Waterlink Inc]** Waterlink has grown by completing ten acquisitions consisting of seventeen operating companies. The success of the Company will depend, in part, on the Company's ability to integrate the operations of these businesses and other companies it acquires, including centralizing certain functions to achieve cost savings and developing programs and processes that will promote cooperation and the sharing of opportunities and resources among its businesses. A number of the businesses offer different services, utilize different capabilities and technologies, target different markets and customer segments and utilize different methods of distribution and sales representatives. While the Company believes that there are substantial opportunities in integrating the businesses, these differences increase the difficulty in successfully completing such integration.

Table V: Sample Managerial Statements of Employee Retention Issues

The table displays the first ten paragraphs returned from metaHeuristica in 1997 that hit on our verbal query intended to measure managerial mentions of employee retention issues. The query was run using metaHeuristica and requires that one word from each of three buckets must appear in a paragraph. The first bucket is acquisition words: {merger, mergers, merged, acquisition, acquisitions, acquired}. The second bucket is employee words: {employee, employees, personnel }. The third bucket is an indication of retention or departures: {retention, departure, departures}. The results from this query are then used to compute the employee retention dummy and the employee retention intensity variables.

Row	Sample Paragraph
1	**[Tellabs Inc]** The Company has a number of employee retention programs under which certain employees, primarily as a result of the Company's acquisitions, are entitled to a specific number of shares of the Company's stock over a two-year vesting period.
2	**[Marvel Entertainment Group]** The Company has been in bankruptcy since December 27, 1996. There is a general uncertainty amongst the Company's employees regarding the outlook of the Company. The Company believes its relationship with its employees is satisfactory, however, it is not known if a merger or sale of the Company under a plan of reorganization would negatively affect employee retention.
3	**[Rational Software Corp]** The ability of the Company to attract and retain the highly trained technical personnel that are integral to its direct sales and product development teams may limit the rate at which the Company can develop products and generate sales. Competition for qualified personnel in the software industry is intense, and there can be no assurance that the Company will be successful in attracting and retaining such personnel. Merger activities, such as the proposed acquisition of Pure Atria, may have a destabilizing effect on employee retention at all levels within the Company. Departures of existing personnel, particularly in key technical, sales, marketing or management positions, can be disruptive and can result in departures of other existing personnel, which in turn could have a material adverse effect upon the Company's business, operating results and financial condition.
4	**[Peoples Bancorp]** Expenses for human resources also increased through the acquisitions and corresponding expansion of the Company's services and geographic area. For the year ended December 31, 1997, salaries and benefits expense increased $844,000 (or 11.2%) to $8,358,000 compared to 1996. The acquisitions increased the number of employees due to the retention of many customer service associates. At December 31, 1997, the Company had 314 full-time equivalent employees, up from 304 full-time equivalent employees at year-end 1996. The Company had 261 full-time equivalent employees at March 31, 1996, before the combined impact of recent acquisition activity. Management expects salaries and employee benefits to increase in 1998 due to the pending West Virginia Banking Center Acquisition and normal merit increases. Management will continue to strive to find new ways of increasing efficiency and leveraging its resources while concentrating on maximizing customer service.
5	**[Whitney Holding Corp]** The Company and its merger candidates incur various non-recurring costs to complete merger transactions and to consolidate operations subsequent to a merger. Such merger-related costs, which are expensed for business combinations accounted for as poolings-of-interests, include change in control payments and severance or retention bonuses for management and employees of the merged entity, investment banker fees, fees for various professional services, including legal, audit and system conversion consulting services, and losses on the disposition of obsolete facilities and equipment and the cancellation of contracts. Total merger-related expenses will vary with each transaction.
6	**[Sinclair Broadcast Group]** Except as otherwise provided in this Section 3.5 or in any employment, severance or retention agreements of any Transferred Employees, all Transferred Employees shall be at-will employees, and Time Broker may terminate their employment or change their terms of employment at will. No employee (or beneficiary of any employee) of Seller may sue to enforce the terms of this Agreement, including specifically this Section 3.5, and no employee or beneficiary shall be treated as a third party beneficiary of this Agreement. Except to the extent provided for herein, Time Broker may cover the Transferred Employees.
7	**[Ensearch Corp]** Mr. Hunter, Mr. Pinkerton and certain other key employees of ENSERCH have entered into retention bonus arrangements, effective as of August 1997, pursuant to which ENSERCH will pay the employee a bonus equal to a percentage of the employee's current annual salary (typically 50% and 100%, respectively) upon the attainment of six and eighteen months of employment. Mr. Biegler was paid a retention bonus of $900,000 by ENSERCH for services up until the consummation of the Merger in August 1997.

Table VI: Post-Merger Integration and Employee retention

The table reports the results of a linear probability model in which the dependent variable is either the ex post (year $t+1$) integration challenges dummy/intensity or the employee retention dummy/intensity as noted in the second column. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). As our goal is to examine ex post outcomes for acquirers, we limit the sample to firms that were an acquirer in year t. The integration challenges dummy is one if the firm's 10-K has a paragraph where the firm mentions integration in the context of a discussion about acquirers and along side vocabulary that indicates difficulty. The employee retention dummy is a dummy that is one if the firm mentions employee retention issues in a paragraph that also discusses acquisitions. The corresponding intensity variable for both dummies measures the number of paragraphs that contain this kind of content. The key independent variables are realized integration, expected integration, and the integration gap variables. Results are similar if we instead use logistic regressions. All regressions include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

Row	Dependent Variable	Expected Integration	Firm Integration	Integration Gap	Log Assets	Log Age	TNIC Total Similarity	Tobins Q	Doc. Length	Obs.
					Panel A: Ex Post Integration Failure					
(1)	Integration Failure Dummy	0.268	-0.411		0.019	-0.061	-0.001	0.008	-0.000	14,361
		(2.02)	(-7.27)		(8.00)	(-8.52)	(-2.50)	(3.10)	(-1.25)	
(2)	Integration Failure Intensity	2.333	-3.049		0.154	-0.423	-0.008	0.054	-0.000	14,361
		(2.36)	(-7.26)		(9.76)	(-8.87)	(-2.57)	(2.91)	(-1.42)	
(3)	Integration Failure Dummy			0.430	0.020	-0.062	-0.001	0.008	-0.000	14,361
				(8.49)	(7.88)	(-8.69)	(-2.40)	(3.11)	(-1.26)	
(4)	Integration Failure Intensity			3.144	0.156	-0.428	-0.008	0.053	-0.000	14,361
				(8.43)	(9.71)	(-9.10)	(-2.47)	(2.91)	(-1.43)	
					Panel B: Ex Post Employee Retention					
(5)	Employee Retention Dummy	0.020	-0.098		0.022	-0.027	0.000	-0.001	0.000	14,361
		(0.22)	(-2.69)		(10.74)	(-4.13)	(0.53)	(-0.20)	(2.50)	
(6)	Employee Retention Intensity	0.331	-0.700		0.166	-0.186	0.001	-0.006	0.000	14,361
		(0.47)	(-2.62)		(10.05)	(-3.92)	(0.42)	(-0.31)	(2.60)	
(7)	Employee Retention Dummy			0.108	0.022	-0.028	0.000	-0.001	0.000	14,361
				(2.92)	(11.45)	(-4.27)	(0.56)	(-0.21)	(2.50)	
(8)	Employee Retention Intensity			0.749	0.167	-0.189	0.001	-0.006	0.000	14,361
				(2.80)	(10.65)	(-4.05)	(0.44)	(-0.31)	(2.59)	

Table VII: Specific Stated Reasons for Post-Merger Integration Failure

The table reports the results of a linear probability model in which the dependent variable is a dummy indicating whether the given firm lists a specific reason (noted in the dependent variable column) for why they experienced integration failure issues. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). The sample is restricted to firms that (A) were an acquirer in year t and (B) have a paragraph where they discuss integration failure, as described in Table VI. This screen reflects that our goal is to uniquely examine which specific integration failure issues are discussed conditional on discussing integration problems. The operations dummy is one if the paragraph describing the firm's integration failure issue also contains one of the following words indicating that failures were related to operational failures: operations, operation, operated, or operational. The products dummy is one if, analogously, at least one of the following words is present: product, products, customer, customers, consumers, or demand. Technological failures are defined analogously based on the following words: technological, technology, technologies, information, systems or system. Employee issue failures are defined analogously based on the following words: personnel, employee, employees, labor or workers. Management failures are defined analogously based on the following words: management, managements, manage, distract, devote, coordination ,divert, diversion, or disrupt. Time/delay failures are defined analogously based on the following words: timely, delay or delays. The key independent variables are realized integration, expected integration, and the integration gap variables. All regressions include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

Row	Dependent Variable	Expected Integration	Firm Integration	Integration Gap	Log Assets	Log Age	TNIC Total Similarity	Tobins Q	Doc. Length	Obs.
					Reasons for Integration Failure					
(1)	Operations	-0.043	0.002		0.009	-0.022	-0.004	-0.001	-0.025	6,284
		(-0.23)	(0.03)		(3.14)	(-2.98)	(-4.67)	(-0.50)	(-1.85)	
(2)	Operations			0.004	0.009	-0.022	-0.004	-0.001	-0.025	6,284
				(0.05)	(3.09)	(-2.95)	(-4.67)	(-0.50)	(-1.86)	
(3)	Products	0.678	-0.358		0.002	0.028	0.002	0.008	-0.062	6,284
		(3.46)	(-3.68)		(0.56)	(3.07)	(2.95)	(3.83)	(-2.98)	
(4)	Products			0.313	0.002	0.030	0.002	0.008	-0.064	6,284
				(3.36)	(0.49)	(3.25)	(2.97)	(3.78)	(-3.04)	
(5)	Tech	0.247	-0.213		0.018	-0.018	-0.000	0.007	-0.022	6,284
		(1.26)	(-2.08)		(4.92)	(-1.86)	(-0.01)	(1.88)	(-0.93)	
(6)	Tech			0.208	0.018	-0.018	-0.000	0.007	-0.023	6,284
				(2.05)	(4.89)	(-1.79)	(-0.01)	(1.88)	(-0.94)	
(7)	Employees	0.496	-0.290		0.006	0.014	-0.001	0.005	-0.066	6,284
		(2.38)	(-2.60)		(1.21)	(1.73)	(-1.26)	(2.71)	(-2.26)	
(8)	Employees			0.261	0.006	0.016	-0.001	0.005	-0.067	6,284
				(2.49)	(1.18)	(1.92)	(-1.27)	(2.73)	(-2.26)	
(9)	Manage	0.238	-0.266		0.002	-0.031	-0.002	0.003	-0.032	6,284
		(1.77)	(-2.99)		(0.57)	(-4.67)	(-4.60)	(0.91)	(-1.64)	
(10)	Manage			0.270	0.002	-0.031	-0.002	0.003	-0.031	6,284
				(2.80)	(0.58)	(-4.69)	(-4.59)	(0.91)	(-1.63)	
(11)	Time	-0.154	-0.017		0.008	-0.030	0.001	-0.001	-0.005	6,284
		(-0.70)	(-0.18)		(1.96)	(-2.46)	(2.06)	(-0.41)	(-0.15)	
(12)	Time			0.040	0.008	-0.031	0.001	-0.001	-0.004	6,284
				(0.49)	(2.01)	(-2.52)	(2.06)	(-0.43)	(-0.12)	

Table VIII: Withdrawn Transactions and Ex Ante Integration difficulty

The table reports the results of regressions in which the dependent variable is a measure of withdrawn transactions. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). In Panel A, one observation is one firm in one year, and the dependent variable is the fraction of a given firm's announced mergers or acquisitions in the given year that were withdrawn. A firm-year observation is only included in the regression if the firm had at least one announced acquisition in the given year. In Panel B, we consider a larger panel database in which one observation is one announced transaction, and the dependent variable is a dummy that is equal to one if the transaction was withdrawn. The key independent variables are realized integration, expected integration, and the integration gap variables. We also include controls for size, age, TNIC total similarity and Tobins Q. All regressions include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

Row	Dependent Variable	Expected Integration	Firm Integration	Integration Gap	Log Assets	Log Age	TNIC Total Similarity	Tobins Q	Obs.
				Panel A: Firm-year regressions					
(1)	Withdrawn	0.017	-0.013		0.000	0.000	-0.000	-0.000	17,216
		(1.11)	(-2.47)		(1.04)	(0.51)	(-1.96)	(-0.89)	
(2)	Withdrawn			0.012	0.000	0.000	-0.000	-0.000	17,216
				(2.67)	(0.99)	(0.54)	(-1.98)	(-0.88)	
				Panel B: Deal-level regressions					
(3)	Withdrawn	0.001	-0.007		-0.000	0.000	-0.000	-0.000	37,961
		(0.04)	(-1.54)		(-0.63)	(0.73)	(-2.17)	(-0.60)	
(4)	Withdrawn			0.008	-0.000	0.000	-0.000	-0.000	37,961
				(2.15)	(-0.58)	(0.62)	(-2.16)	(-0.60)	

Table IX: Post-Merger Real Outcomes and Ex ante Integration Gap

The table reports the results of OLS regressions in which the dependent variable is a measure of ex post real outcomes as noted in the second column. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). As our goal is to examine ex post outcomes for acquirers, we limit the sample to firms that were an acquirer in year t. We consider outcomes measured as changes for both a one-year horizon and a three year horizon, where the horizon begins in year t of the merger and ends in year $t+1$ or $t+3$. We consider the following outcomes: ex post changes operating income scaled by assets and ex post changes in SG&A/sales. All regressions include industry and year fixed effects, RHS variables are standardized prior to running regressions, and standard errors are clustered by industry.

Row	Dependent Variable	Expected Integ-ration	Realized Integ-ration	Integ-ration Gap	Log Assets	Log Age	TNIC Total Simil.	Tobins Q	Lagged Dep. Var.	Obs.
(1)	Yr 1 Δ OI/Assets	-0.035	0.046		0.005	0.005	-0.000	-0.000	-0.192	18,989
		(-1.45)	(4.38)		(7.74)	(4.47)	(-1.89)	(-0.09)	(-13.00)	
(2)	Yr 1 Δ OI/Assets			-0.047	0.005	0.006	-0.000	-0.000	-0.192	18,989
				(-4.56)	(7.69)	(4.55)	(-1.93)	(-0.09)	(-13.00)	
(3)	Yr 3 Δ OI/Assets	-0.031	0.054		0.008	0.005	-0.000	-0.003	-0.324	18,989
		(-0.90)	(3.50)		(8.46)	(2.66)	(-3.54)	(-2.58)	(-16.32)	
(4)	Yr 3 Δ OI/Assets			-0.057	0.008	0.005	-0.000	-0.003	-0.324	18,989
				(-3.79)	(8.41)	(2.75)	(-3.58)	(-2.58)	(-16.32)	
(5)	Yr 1 Δ SG&A/Sales	0.041	-0.047		-0.003	0.001	0.000	0.004	-0.151	18,989
		(1.97)	(-4.83)		(-5.18)	(0.73)	(0.33)	(4.92)	(-19.53)	
(6)	Yr 1 Δ SG&A/Sales			0.048	-0.003	0.001	0.000	0.004	-0.151	18,989
				(4.88)	(-5.14)	(0.69)	(0.34)	(4.93)	(-19.52)	
(7)	Yr 3 Δ SG&A/Sales	0.084	-0.067		-0.006	0.003	0.000	0.007	-0.269	18,989
		(2.66)	(-4.61)		(-6.26)	(1.88)	(2.40)	(6.18)	(-24.02)	
(8)	Yr 3 Δ SG&A/Sales			0.065	-0.006	0.003	0.000	0.007	-0.268	18,989
				(4.51)	(-6.28)	(1.95)	(2.38)	(6.18)	(-24.00)	

Table X: Post-Merger Divestitures, Acquisitions and Ex ante Integration Gap

The table reports the results of OLS regressions in which the dependent variable is a measure of ex post divestiture (Panel A), ex post acquiring activity (Panel B), or ex post net acquisitions (Panel C). Our sample only includes single segment firms (see Online Appendix for results when all firms are included). As our goal is to examine ex post outcomes for acquirers, we limit the sample to firms that were an acquirer in year t. We consider outcomes measured as changes for both a one-year horizon and a two year horizon, where the horizon begins in year $t+1$ after the merger. The use of a forward window avoids having the calculation load on the year of the merger itself, and reflects our objective of examining longer-term outcomes. We consider the following restructuring variables ex post increases in the incidence of the firm being a target and divesting in the one to three year period following an acquisition. Where $N_{div,t}$ is the number of divestiture transactions a given firm has in year t, we for example compute the one-year increase in divestitures using the following logarithmic formula: $log[\frac{1+N_{div,t+1}}{1+N_{div,t}}]$. We compute the growth in acquisitions using a parallel formula, and the growth in net acquisitions is equal to the growth in acquisitions minus the growth in divestitures. The three year growth variables are computed in an analogous fashion using year three year-transaction counts ($t+1$ to $t+3$) instead of just year $t+1$ counts. This form computes growth in a relative way while avoiding the overweighting of outliers. The key independent variables are the expected integration, and realized integration. We also consider the integration gap, which is expected integration minus realized integration. All regressions include industry fixed effects and year fixed effects, and standard errors are clustered by industry.

Row	Dependent Variable	Expected Integration	Realized Firm Integration	Integration Gap	Log Assets	Log Age	TNIC Total Similarity	Tobins Q	Lagged Dep. Var.	Obs.
					Panel A: Divestitures					
(1)	Yr 1 Δ Divestitures	0.043	-0.064		0.022	0.015	-0.000	-0.004	0.003	21,713
		(0.88)	(-2.75)		(17.04)	(5.42)	(-2.40)	(-6.52)	(0.65)	
(2)	Yr 3 Δ Divestitures	0.129	-0.122		0.062	0.026	-0.001	-0.003	-0.051	15,686
		(1.06)	(-1.97)		(20.36)	(3.86)	(-2.86)	(-2.06)	(-5.02)	
(3)	Yr 1 Δ Divestitures			0.067	0.022	0.015	-0.000	-0.004	0.003	21,713
				(2.90)	(17.08)	(5.39)	(-2.37)	(-6.53)	(0.66)	
(4)	Yr 3 Δ Divestitures			0.121	0.062	0.026	-0.001	-0.003	-0.051	15,686
				(2.00)	(20.36)	(3.86)	(-2.87)	(-2.06)	(-5.02)	
					Panel B: Acquisitions					
(5)	Yr 1 Δ Acquisitions	-0.060	0.052		0.023	-0.005	-0.000	0.008	0.027	21,713
		(-1.56)	(2.95)		(23.38)	(-2.22)	(-3.37)	(11.93)	(8.33)	
(6)	Yr 3 Δ Acquisitions	-0.015	0.060		0.048	-0.001	-0.001	0.010	-0.025	15,686
		(-0.17)	(1.43)		(21.08)	(-0.25)	(-2.91)	(9.35)	(-3.94)	
(7)	Yr 1 Δ Acquisitions			-0.051	0.023	-0.005	-0.000	0.008	0.027	21,713
				(-2.96)	(23.46)	(-2.24)	(-3.36)	(11.92)	(8.33)	
(8)	Yr 3 Δ Acquisitions			-0.066	0.048	-0.001	-0.001	0.010	-0.025	15,686
				(-1.62)	(20.96)	(-0.19)	(-2.95)	(9.36)	(-3.93)	
					Panel C: Net Acquisitions					
(9)	Yr 1 Δ Net Acquisitions	-0.101	0.118		0.003	-0.021	-0.000	0.011	-0.007	21,713
		(-1.63)	(3.98)		(2.26)	(-6.18)	(-0.70)	(12.09)	(-1.58)	
(10)	Yr 3 Δ Net Acquisitions	-0.123	0.181		-0.012	-0.032	0.000	0.013	-0.098	15,686
		(-0.87)	(2.65)		(-3.17)	(-4.13)	(0.23)	(7.19)	(-10.25)	
(11)	Yr 1 Δ Net Acquisitions			-0.119	0.003	-0.021	-0.000	0.011	-0.007	21,713
				(-4.12)	(2.24)	(-6.17)	(-0.72)	(12.10)	(-1.58)	
(12)	Yr 3 Δ Net Acquisitions			-0.188	-0.012	-0.031	0.000	0.013	-0.098	15,686
				(-2.81)	(-3.20)	(-4.08)	(0.20)	(7.19)	(-10.22)	

Table XI: ex ante Merger Integration Gap and Announcement Returns

The table reports the results of OLS regressions in which the dependent variable is either the announcement return of the combined firm (Panel A), the target (Panel B) and the acquirer (Panel C). Our sample only includes acquirer and target pairs where both are single segment firms (see Online Appendix for results when all firms are included). We consider announcement returns measured just on day $t = 0$, and also a 3-day, a 5-day, and a 7-day window, where all windows are centered around $t = 0$. The key independent variables of interest are the Synergy Integration Gap, the Target integration gap, and the Acquirer Integration gap. The target and acquirer integration gap are computed as discussed in Table I. The synergy integration gap can only be computed if the target and acquirer are publicly traded and is computed in three steps. First, for every firm in the economy excluding the target and the acquirer, we compute the cosine similarity of each firm's business description with the target business description and separately with the acquirer's business description. Second, we take the product of these two cosine similarities for each firm, and take the ten firms with the highest product. These firms are most similar to the "combination" of the acquirer and the target as they load highly regarding similarity to both. Third, we extract the words in these top ten firms that are not in the pre-merger target and acquirer. Expected Synergy Integration Gap is then the weighted average expected integration of these words, which identifies the expected level of integration the likely synergies of the merger pair will likely have to realize for success. We also compute synergy uniqueness as minus one times the average of the product of the pairwise similarities of the top ten firms to the target and the acquirer. This measure is high when the top ten firms are in fact relatively dissimilar to the acquirer and the target, indicating that the likely synergies are highly unique as few firms in the economy operate in the synergy space. The resulting measures of integration difficulty are ex ante measurable and assess integration for both the target and acquirer assets in place, and also the likely synergies. The remaining variables are discussed in Table I. All regressions include industry and year fixed effects, RHS variables are standardized prior to running regressions, and standard errors are clustered by industry.

Row	Group	Expected Synergy Integration Gap	Acquirer Integration Gap	Target Integration Gap	Synergy Unique-ness	Acq. Numb. Para-graphs	Target Numb. Para-graphs	Log Assets	Log Age	Target Fraction of Acquirer	Pairwise TNIC Simil. Score	Expected Gain in Product Diff.	Market to Book	Document Size	Obs.
							Panel A: Combined Firm Announcement Returns								
(1)	Combined	-0.002			0.081	0.002	0.001	-0.004	0.001	0.003	0.002	0.000	-0.004	-0.001	3,248
	1 day	(-1.37)			(1.35)	(1.33)	(0.96)	(-2.89)	(0.69)	(6.40)	(2.72)	(0.34)	(-4.72)	(-0.44)	
(2)	Combined	-0.003			0.104	0.002	0.001	-0.007	0.001	0.007	0.002	-0.001	-0.002	-0.003	3,248
	3 days	(-2.59)			(1.28)	(1.34)	(0.40)	(-3.19)	(0.66)	(3.98)	(2.69)	(-0.41)	(-1.26)	(-1.01)	
(3)	Combined	-0.001	0.001	-0.000	0.074	0.002	0.001	-0.005	0.001	0.003	0.002	0.000	-0.004	-0.001	3,248
	1 day	(-1.31)	(0.90)	(-0.11)	(1.29)	(1.70)	(0.71)	(-2.88)	(0.70)	(6.26)	(2.68)	(0.29)	(-4.81)	(-0.30)	
(4)	Combined	-0.003	0.001	-0.002	0.106	0.003	-0.000	-0.007	0.001	0.007	0.002	-0.001	-0.003	-0.002	3,248
	3 days	(-2.67)	(0.80)	(-1.08)	(1.30)	(1.74)	(-0.39)	(-3.19)	(0.67)	(3.87)	(2.71)	(-0.41)	(-1.29)	(-0.88)	
							Panel B: Target Firm Announcement Returns								
(5)	Target	-0.011			-0.077	0.001	0.000	-0.038	0.003	0.001	-0.005	-0.005	-0.008	0.001	3,248
	1 day	(-2.62)			(-0.48)	(0.16)	(0.04)	(-5.10)	(0.74)	(0.45)	(-1.49)	(-1.45)	(-2.04)	(0.17)	
(6)	Target	-0.018			-0.315	0.009	0.004	-0.064	0.008	0.006	-0.007	-0.011	-0.012	-0.007	3,248
	3 days	(-3.86)			(-1.78)	(1.51)	(1.44)	(-6.22)	(1.77)	(3.65)	(-1.56)	(-2.51)	(-3.39)	(-1.27)	
(7)	Target	-0.010	0.008	0.009	-0.190	0.004	0.005	-0.038	0.002	0.001	-0.005	-0.005	-0.009	0.003	3,248
	1 day	(-2.34)	(1.63)	(3.14)	(-1.15)	(0.71)	(1.69)	(-5.14)	(0.72)	(0.46)	(-1.67)	(-1.62)	(-2.14)	(0.51)	
(8)	Target	-0.017	0.008	0.007	-0.412	0.012	0.007	-0.064	0.008	0.006	-0.007	-0.011	-0.012	-0.005	3,248
	3 days	(-3.57)	(1.34)	(2.58)	(-2.46)	(1.93)	(2.26)	(-6.24)	(1.79)	(3.60)	(-1.65)	(-2.61)	(-3.38)	(-0.92)	
							Panel C: Acquirer Firm Announcement Returns								
(9)	Acquirer	0.000			0.087	0.003	0.001	-0.004	0.002	-0.002	0.001	0.002	-0.001	-0.004	3,248
	1 day	(0.32)			(1.66)	(1.61)	(0.80)	(-2.04)	(1.54)	(-0.72)	(1.86)	(2.31)	(-0.53)	(-1.38)	
(10)	Acquirer	-0.001			0.241	0.001	0.002	-0.006	0.001	-0.003	0.000	0.002	-0.000	-0.002	3,248
	3 days	(-0.40)			(2.55)	(0.33)	(0.76)	(-2.78)	(1.01)	(-1.01)	(0.00)	(1.45)	(-0.13)	(-0.61)	
(11)	Acquirer	0.000	-0.000	-0.002	0.098	0.003	-0.000	-0.004	0.002	-0.002	0.001	0.002	-0.001	-0.003	3,248
	1 day	(0.31)	(-0.03)	(-1.92)	(1.81)	(1.78)	(-0.08)	(-2.05)	(1.56)	(-0.74)	(2.06)	(2.28)	(-0.54)	(-1.30)	
(12)	Acquirer	-0.001	-0.000	-0.003	0.262	0.001	-0.000	-0.006	0.001	-0.003	0.000	0.002	-0.000	-0.002	3,248
	3 days	(-0.46)	(-0.03)	(-1.72)	(2.77)	(0.36)	(-0.01)	(-2.78)	(1.01)	(-1.06)	(0.16)	(1.45)	(-0.14)	(-0.55)	

Table XII: Fama MacBeth Monthly Return Regressions

The table displays Fama-MacBeth regressions form July 1997 to December 2015 in which the dependent variable is the firm's monthly excess stock return. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). The acquirer dummy is one if the firm was an acquirer in a merger or an acquisition of assets transaction in the previous one-year period (based on effective date and lagged 6 months for consistency with other variables). The integration gap variable is from the past fiscal year and is lagged using the minimum 6 month lag required in Davis, Fama, and French (2000). For each of the three integration variables we examine, we use a dummy variable indicating whether the given value is in the high tercile in the given year. Realized integration is the extent to which a firm's individual words appear within its own paragraphs in a distribution close to a uniform distribution. Expected integration is the extent to which a firm uses vocabulary that generally appears in a uniform distribution across paragraphs in all firms that use the given word in the economy in the given year. The integration gap is expected integration minus realized integration. We also consider cross terms based on the acquirer dummy and each integration variable. Finally, we include controls for the log book to market ratio, the log of firm market capitalization and the past one year stock return, where these variables are measured following Davis, Fama, and French (2000). All variables are ex ante measurable and quantities from any given fiscal year follow the lag structure of Davis, Fama, and French (2000). For example, any variable from a fiscal year ending in calendar year t will not be used to predict returns until July of year $t+1$. We discard penny stock firms from our sample if they have a stock price of one dollar or less.

Row	Acquirer Dummy	High Ex Ante Expected Integration	Acquirer Dum x Hi Expected Integration	High Ex Ante Realized Integration	Acquirer Dum x Hi Realized Integration	High Ex Ante Integration Gap	Acquirer Dum x Hi Integration Gap	Fraction Stock	Missing Fraction Stock	Log B/M Ratio	Log Size	Past Year Stock Return	Periods / Obs.
(1)	-0.089									0.080	-0.024	0.166	210
	(-1.46)									(0.66)	(-0.21)	(0.71)	562,636
(2)	-0.089	-0.095	-0.015							0.081	-0.024	0.164	210
	(-1.26)	(-0.81)	(-0.15)							(0.66)	(-0.21)	(0.70)	562,636
(3)	-0.148			-0.193	0.189					0.079	-0.027	0.162	210
	(-2.07)			(-1.77)	(2.05)					(0.64)	(-0.24)	(0.69)	562,636
(4)	-0.128	0.006	-0.155	-0.203	0.275					0.079	-0.027	0.162	210
	(-1.72)	(0.06)	(-1.47)	(-2.11)	(2.83)					(0.65)	(-0.24)	(0.69)	562,636
(5)	-0.021					0.177	-0.194			0.079	-0.027	0.166	210
	(-0.34)					(2.17)	(-2.44)			(0.64)	(-0.24)	(0.71)	562,636
(6)	-0.092	0.007	-0.160	-0.203	0.276			-0.004	-0.025	0.079	-0.028	0.161	210
	(-0.95)	(0.06)	(-1.52)	(-2.12)	(2.85)			(-1.33)	(-0.29)	(0.64)	(-0.25)	(0.69)	562,636
(7)	0.018					0.178	-0.193	-0.004	-0.032	0.078	-0.028	0.165	210
	(0.21)					(2.18)	(-2.43)	(-1.34)	(-0.37)	(0.64)	(-0.24)	(0.71)	562,636

Table XIII: Fama MacBeth Monthly Return Regressions (Subsample Analysis)

The table displays Fama-MacBeth regressions form July 1997 to December 2015 in which the dependent variable is the firm's monthly excess stock return. We consider the full sample, subsamples based on above vs below median cash/assets and the MB ratio, and subsamples that only include either single segment or multi-segment firms. The acquirer dummy is one if the firm was an acquirer in a merger or an acquisition of assets transaction in the previous one-year period (based on effective date and lagged 6 months for consistency with other variables). The integration gap variable is from the past fiscal year, and is lagged using the minimum 6 month lag required in Davis, Fama, and French (2000). The integration gap is expected integration minus realized integration, and we use a dummy variable indicating whether the given value is in the high tercile in the given year. We also consider cross terms based on the acquirer dummy and each integration variable. Finally, we include controls for the log book to market ratio, the log of firm market capitalization and the past one year stock return, where these variables are measured following Davis, Fama, and French (2000). All variables are ex ante measurable and quantities from any given fiscal year follow the lag structure of Davis, Fama, and French (2000). For example, any variable from a fiscal year ending in calendar year t will not be used to predict returns until July of year $t+1$. We discard penny stock firms from our sample if they have a stock price of one dollar or less.

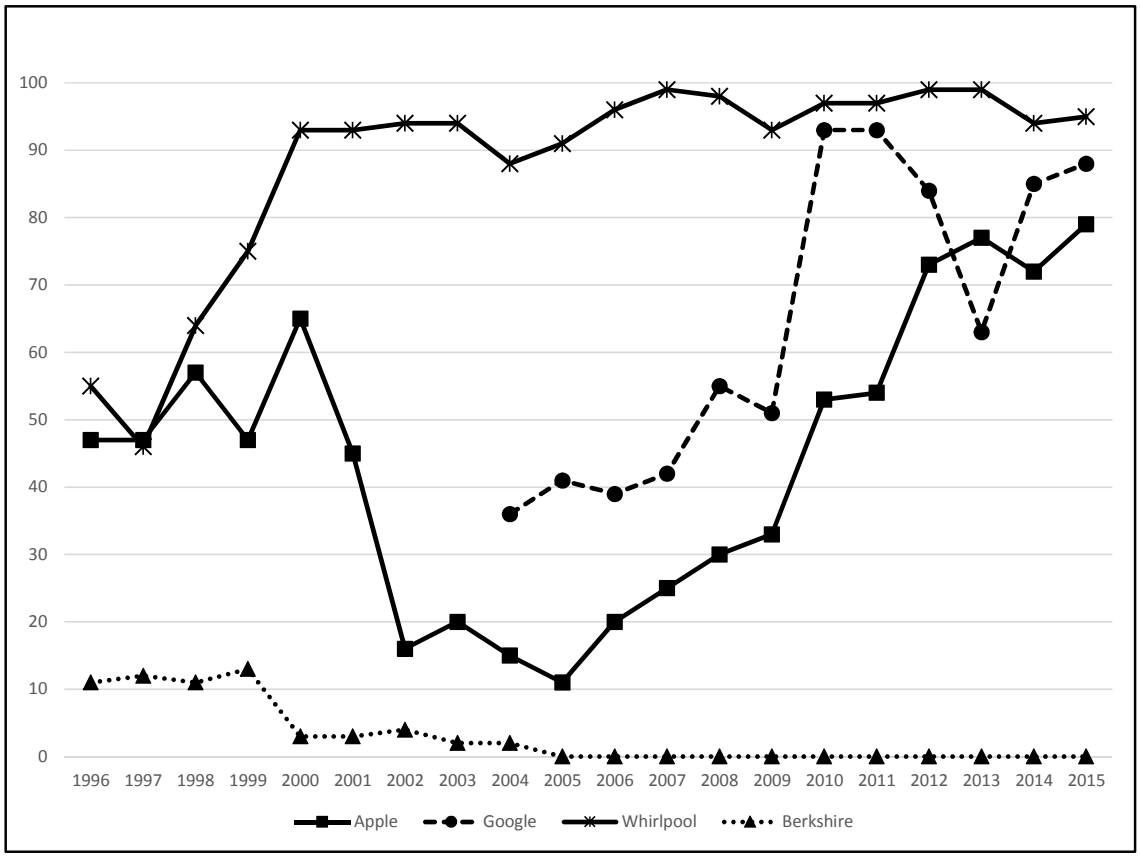
Row	Acquirer Dummy	High Ex Ante Integration Gap	Acquirer Dum x Hi Integration Gap	Log B/M Ratio	Log Size	Past Year Stock Return	Periods / Obs.
				Entire Sample (All Single Segment Firms)			
(1)	-0.021	0.177	-0.194	0.079	-0.027	0.166	210
	(-0.34)	(2.17)	(-2.44)	(0.64)	(-0.24)	(0.71)	562,636
				Above Median Cash/Assets Subsample			
(2)	0.009	0.342	-0.341	0.195	0.012	0.052	210
	(0.10)	(2.54)	(-2.95)	(1.69)	(0.09)	(0.25)	273,482
				Below Median Cash/Assets Subsample			
(3)	-0.089	0.010	-0.037	0.014	-0.057	0.297	210
	(-1.39)	(0.15)	(-0.37)	(0.17)	(-0.57)	(0.97)	279,964
				Above Median M/B ratio Subsample			
(4)	-0.127	0.217	-0.132	0.196	-0.000	-0.039	210
	(-1.30)	(1.43)	(-1.19)	(1.88)	(-0.00)	(-0.15)	285,075
				Below Median M/B ratio Subsample			
(5)	0.075	0.140	-0.272	0.140	-0.066	0.419	210
	(1.04)	(1.93)	(-2.59)	(1.34)	(-0.58)	(1.62)	274,742
				Conglomerate Firms Only Subsample			
(6)	-0.070	0.063	-0.065	0.106	-0.063	0.138	210
	(-1.09)	(0.59)	(-0.66)	(1.16)	(-0.56)	(0.44)	219,009
				Single Segment Firms and Conglomerates Combined			
(7)	-0.031	0.130	-0.157	0.083	-0.039	0.151	210
	(-0.58)	(1.62)	(-2.30)	(0.75)	(-0.34)	(0.62)	781,645

Table XIV: Fama MacBeth Monthly Return Regressions (by Integration Quintiles)

The table displays Fama-MacBeth regressions form July 1997 to December 2015 in which the dependent variable is the firm's monthly excess stock return. Our sample only includes single segment firms (see Online Appendix for results when all firms are included). We present results for quintiles based on sorting firms based on their integration gap in the full sample (Panel A), high cash subsample (Panel B), and low cash subsample (Panel C). The acquirer dummy is one if the firm was an acquirer in a merger or an acquisition of assets transaction in the previous one-year period (based on effective date and lagged 6 months for consistency with other variables). The integration gap variable is from the past fiscal year, and is lagged using the minimum 6 month lag required in Davis, Fama, and French (2000). The integration gap is expected integration minus realized integration. Finally, we include controls for the log book to market ratio, the log of firm market capitalization and the past one year stock return, where these variables are measured following Davis, Fama, and French (2000). All variables are ex ante measurable and quantities from any given fiscal year follow the lag structure of Davis, Fama, and French (2000). For example, any variable from a fiscal year ending in calendar year t will not be used to predict returns until July of year $t+1$. We discard penny stock firms from our sample if they have a stock price of one dollar or less.

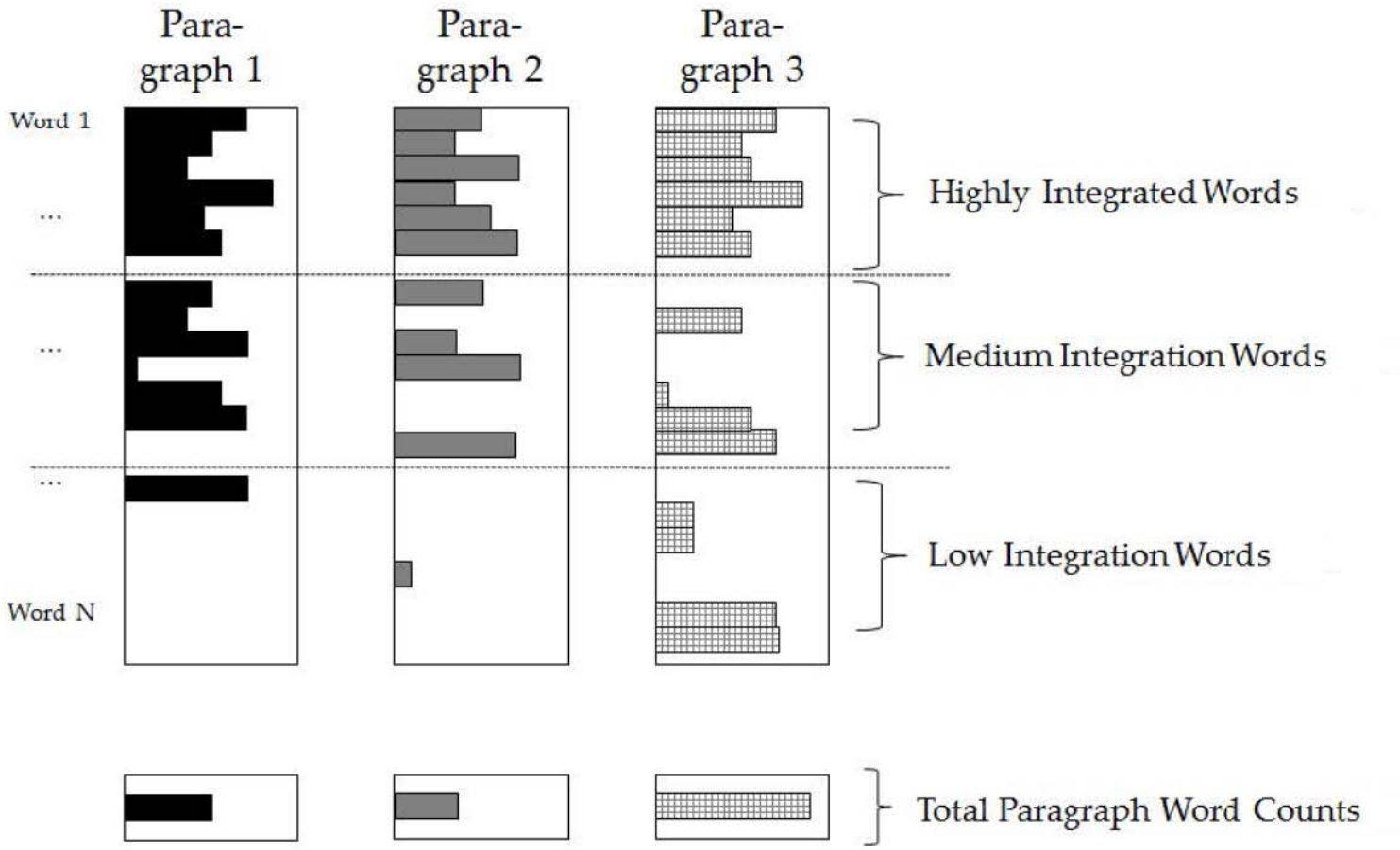
Row	Quintile	Acquirer Dummy	Log B/M Ratio	Log Size	Past Year Stock Return	Periods / Obs.
			Panel A: Integration Gap Quintiles (All Single Segment Firms)			
(1)	Quintile 1	0.016	0.110	-0.012	-0.048	210
		(0.17)	(1.36)	(-0.11)	(-0.19)	113,185
(2)	Quintile 2	-0.004	0.167	0.005	0.103	210
		(-0.04)	(1.24)	(0.04)	(0.39)	112,824
(3)	Quintile 3	-0.040	0.012	-0.066	0.179	210
		(-0.37)	(0.09)	(-0.48)	(0.76)	112,653
(4)	Quintile 4	-0.133	0.124	-0.073	0.201	210
		(-1.31)	(0.80)	(-0.52)	(0.85)	112,436
(5)	Quintile 5	-0.296	-0.033	-0.013	0.345	210
		(-2.49)	(-0.23)	(-0.11)	(1.09)	111,538
			Panel B: Integration Gap Quintiles (Above Median Cash/Assets Single Segment Firms)			
(6)	Quintile 1	0.194	0.185	0.079	-0.031	210
		(1.39)	(1.97)	(0.67)	(-0.12)	55,222
(7)	Quintile 2	0.076	0.252	0.079	0.014	210
		(0.47)	(1.78)	(0.57)	(0.06)	55,066
(8)	Quintile 3	-0.225	0.189	-0.103	-0.013	210
		(-1.33)	(1.35)	(-0.66)	(-0.06)	55,001
(9)	Quintile 4	-0.163	0.210	-0.077	-0.024	210
		(-1.08)	(1.33)	(-0.44)	(-0.10)	54,401
(10)	Quintile 5	-0.513	0.093	0.008	0.197	210
		(-3.13)	(0.65)	(0.05)	(0.70)	53,792
			Panel C: Integration Gap Quintiles (Below Median Cash/Assets Single Segment Firms)			
(11)	Quintile 1	-0.126	0.021	-0.096	-0.039	210
		(-1.21)	(0.18)	(-0.80)	(-0.14)	55,952
(12)	Quintile 2	-0.135	0.116	-0.046	0.131	210
		(-1.12)	(1.06)	(-0.38)	(0.40)	56,043
(13)	Quintile 3	0.005	-0.095	-0.037	0.558	210
		(0.04)	(-0.68)	(-0.29)	(1.88)	55,878
(14)	Quintile 4	-0.053	0.058	-0.075	0.483	210
		(-0.48)	(0.42)	(-0.61)	(1.33)	56,169
(15)	Quintile 5	-0.156	-0.023	-0.037	0.591	210
		(-1.17)	(-0.22)	(-0.33)	(1.33)	55,922

Figure 1:



Notes: The Figure displays the realized integration over time for four sample firms of interest: Apple, Google, Whirlpool and Bershire Hathaway.

Figure 2:



Notes: The Figure visually illustrates examples of highly integrated and highly non-integrated words based on their distribution across paragraphs. Words that are thoroughly mixed in all paragraphs are integrated into the firm's product offerings fully. Words that appear only in one, or a small number, of paragraphs are not integrated. At the bottom of the figure, we depict the distribution of total word counts across paragraphs, which motives our measure of word-level integration based on distributional proximity of a word's distribution to this aggregate paragraph length distribution.