

**Labor Threats, Product Market Competition and
Seemingly Self Sabotaging Disclosures**

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(Preliminary Draft)

Abstract

We investigate the nature of strategic disclosure by managers facing labor related threats and product market competition from existing rivals. We test and find empirical support for extant theory that when a firm faces labor related threats and product market competition simultaneously, the additive forces of non-disclosure of good news weakens, and a firm is likely to disclose good news. In the face of competition and labor threats, disclosing good news may look counterintuitive, but it helps managers to curtail aggressive bargaining by its employee base. We further contribute to literature by introducing two new measures of labor related threats. Using these new measures, we document that firms withhold good news when facing either labor threats or product market competition individually. But the joint presence of both entities weakens the incentives of firms to withhold good news, rather than strengthening it. Our results are robust to alternate definitions of labor threats, entropy balancing and fixed effects specifications.

Keywords: Product Market Competition, Voluntary Disclosure, Union, Self-Sabotage

1. Introduction

A rich body of literature examines the disclosure choices made by firms that face threats from organized labor unions. Managers of unionized firms operate under countervailing forces of capital market expectations of profitable performance, and pursuit of rent extraction by organized labor unions. While shareholders value profitable performance, labor unions bargain aggressively to extract a greater share from the profits for the employees of the firm that are covered by collective bargaining agreements¹. Capital markets impound the threat of abnormal rent extraction by aggressive labor unions and value firms net of such transfers. Hence, managers have the incentive to minimize expected rent transfers to firms' employees, thereby keeping a larger portion of the profit pie for firm's shareholders. This apparent tension between the concerns of employees and the concerns of shareholders induces managers to withhold information or avoid projecting an overtly positive outlook. Prior literature documents managers of unionized firms making a variety of accounting choices that seeks to steepen information asymmetry and signal a negative outlook for the firm to curtail assertive bargaining by its labor union².

Labor unions face bargaining costs³ that prevent them from bargaining unless benefits of bargaining exceed costs of bargaining. Bad news disclosure tends to have adverse capital market consequences for the firm, but then unions also back off from bargaining as there might be little that can be extracted when firm is not performing well. The benefits from bargaining

¹ Christofides and Oswald (1992), Blanchflower et al. (1996) document that labor unions can extract higher wages from profitable firms. Hirsch (2008) documents that unionized employees can extract 'above market' rents from firms owing to higher leverage they gain during negotiations from collective bargaining agreements.

² See Hilary (2006), Bova (2013), Chung et al. (2016), Hamm (2018), Chang et al. (2022) for details of how firms reduce disclosure, miss analyst benchmarks, are more likely to provide bad news disclosures than good news disclosures, smoothen earnings and manage earnings by manipulating accruals and real earnings respectively.

³ Bargaining costs include litigation, arbitration costs, costs incurred to organize strikes, protests, picketing etc.

do not compensate for the costs associated with bargaining. This makes disclosures a delicate balancing act for managers. On one hand, she knows that bad news disclosure would make the union or employee base curtail their aggressiveness but can have negative impact on firm valuations. On the other hand, good news disclosures signaling profitability would have healthy valuation outcomes for the firm, but also invite aggressive bargaining by unions. Since bargaining by unions is likely obtained when a certain threshold of profitability is met and expected benefits from bargaining in the form of increased wages, bonuses, facilities etc. exceed costs of bargaining⁴, manager tends to withhold good news or disclose bad news.

Product market competition also plays a significant role in driving managerial disclosure behaviour. Companies operating in industries characterized by a high competition face the potential appropriation of profits by existing rivals. Good news disclosures signalling future profitability from a firm's manager in such an industry reveals information that may lead rivals to take actions detrimental to disclosing firm's profit. Extant literature assigns the nomenclature of *proprietary costs* to the disadvantages faced by firms from good news disclosures. For example, proprietary costs are assumed to be high when a firm is operating in a highly competitive industry (oligopolistic or otherwise) or in an industry where technological innovation is rapid (proxied by high R&D expenses, patent filings etc.). If favourable disclosure by one firm helps in production and pricing decision of the other, thereby appropriating some of the profits of the former, then such a disclosure is sub-optimal. Managers can choose not to project positive prospect (even avoid disclosures completely) in such a scenario as action by rivals can impose costs on the incumbent in form of loss of profits⁵.

The disclosure choices made by firms in presence of such multiple recipients (capital markets and competition, or capital markets and labor union etc.) have been studied extensively. In each

⁴ See Arya and Ramanan (2022)

⁵ See Wagenhofer (1990) for detailed model on firm's disclosure strategy when facing opponent.

of these scenarios the firm faces conflicting disclosure incentives- it wants to disclose good news to one recipient (capital market) but withhold good news from the other (rival or union). What would be the disclosure choice of a firm that faces two recipients at the same time with whom disclosure incentives are aligned individually? That is, what would the firm disclose (or not disclose) when it faces off with a labor union and a product market competitor simultaneously, when, if faced individually, the firm would withhold good news in each case? Intuition dictates that firms should double down on withholding good news in such cases as withholding good news and disclosing bad news (if available) takes care of both proprietary costs concerns and prevents extractive bargaining by labor union. Arya and Ramana, *AR* henceforth, challenge this prevalent thinking and analytically examine the disclosure choices when firm faces recipients that impose identical disclosure incentives. For example, a firm facing entry threat or rival and labor union, or a firm facing political costs or regulatory threat and a labor union etc. *AR* shows that when a firm must deal with the joint presence of such entities that impose aligned disclosure incentives, economic forces that lead to withholding of good news is not additive. Instead, the incentive to *withhold* good news *weakens* and firm may *disclose* good news instead.

The intuition behind *AR* is that a firm's disclosure has a direct impact on union's actions and an indirect impact on union's action through the actions of the firm's product market competitor who is also observing the same disclosure. When the firm faces each of them individually, it discloses unfavourable news (or withholds good news), in line with prediction of existing literature. The joint presence weakens firm's incentive to project a negative outlook. This disclosure seems to be counter- intuitive because indication of better prospects can induce both- aggressive bargaining by the union (employee base) as well as strategic action by the product market rival. But what may not be immediately apparent is that disclosure of good news induces the rival to act, and the rival's actions eat into the profits of the disclosing firm, leading

to a decrease of the overall profit pie for the firm. The smaller pie leaves less profits from which the union can bargain for its share. Thus, labor union's decision to bargain hard or not is directly impacted by disclosure of favourable news (or less unfavourable news) and indirectly impacted by the actions of the product market rival. *AR* goes on to make the argument that their model is applicable in a broader setting where the firm's disclosures are in a certain direction when it faces each recipient individually, but joint presence of both the recipients induces the firm to make the firm to disclose in the opposite direction.

We test the prediction of *AR* in a setting where a firm faces labor related threats and product market competition at the same time. We test whether in the face of product market competition and labor related threats, the likelihood of managers strategically disclosing good news rather than bad news to reduce rent extraction by labor force is the equilibrium outcome. Manager chooses to be exposed on one front to reduce bargaining leverage of labor force. This strategic 'playing off' of two opponents- employees and rivals, through good news disclosures leads to availability of more value to be transferred to shareholders of the firm.

We expand the ambit of threats arising out of unionization⁶ to include a broader spectrum of threats arising out of labor related issues as perceived by managers themselves. While threats arising from organized labor are a significant subset and have been a matter of examination of previous research, other labor related issues like strikes, hiring, layoffs, resignations, union pacts, workforce-salary etc. can also mold a firm's voluntary disclosures. Further, unionization tends to be persistent and extant studies that use unionization measures (usually a binary variable) lack the power to test labor threats that are sporadic, and/or of pressing nature. To that end we introduce two novel measures that proxy for labor related threats at a more granular level. Both the measures are based on textual analytics of discussion of labor related issues in

⁶ Current state of accounting literature at the intersection of labor and firm disclosures revolves around measures of unionization, collective bargaining proxies, etc. as one of the main independent variables.

quarterly earnings conference calls. The first one measures imminent, pressing threats faced by a firm from labor force, and the second one borrows tools from computational linguistics and computes a continuous ongoing measure of labor related threats faced by a firm. We also introduce a third measure in our robustness checks by leveraging the sentiment of labor related news in media. The first and second measures give us an understanding of how managers themselves perceive labor risks and threats while disseminating information during quarterly earnings conference calls. The third measure of labor related threats closes the loop by examining how external observers are looking at labor related issues faced by a firm. These three new measures along with an extant measure of labor related threat⁷ gives us a holistic picture of labor threats faced by firms.

The rest of the article is organized as follows- Section 2 proceeds with literature review and development of hypothesis, Section 3 provides details of sample, key variables creation, controls and descriptive statistics. Section 4 presents our empirical methodology and results of our hypothesis, Section 5 has robustness checks, and Section 6 concludes the paper.

2. Prior Literature and Hypothesis Development

An extensive body of work in analytical literature demonstrates that firms are dissuaded from disclosing positive outlook due to costs imposed by heightened competition. Good news disclosures by informed firms induces overproduction by uninformed firms. On the other hand, bad news disclosures curtail production. Thus, managers of firms with private information of future state of demand have the incentive to withhold news about future state of demand and disclose bad news about future state of demand. Verrecchia (1983) models such disclosure choices in a competitive environment under proprietary cost considerations. He argues that increased competition leads to less disclosures owing to proprietary cost concerns. On the other

⁷ We also test the prediction of AR using extant firm-year measure of unionization (Hamm, 2018) as a robustness check.

hand, competitive pressures defined in terms of entry costs induce voluntary disclosures [Wagenhofer (1990)]; Darrough and Stoughton (1990)⁸]. Investors impound the potential negative impact on a firm revealing proprietary information and desist from imposing adverse selection on such firms. In a post entry duopoly game, Clint and Verrechia (1997) argue that firms with information about very high (very low) state of the world hide it from uninformed competitors. In equilibrium, a higher level of competition discourages disclosure. Li (2010) empirically tests predictions of Clint and Verrechia (1997) and finds that existing competition decreases disclosure quantity and quality. She also finds that existing competition degrades disclosure quantity but enhances quality through tempering optimism in profit forecasts and reducing pessimism in investment forecasts. Huang et al. (2017) lend further credence to proprietary cost hypothesis by demonstrating that tariff reductions increase competition and reduce management forecasts.

Extant research pertaining to the impact of product market competition on accounting choices provides a mixed menu of results. On the one hand, Marciukyte and Park (2009), Wang and Winton (2012), Datta and Datta (2013), and Markarian and Santalo (2014) provide evidence that competition moderates accruals management and increases informativeness of earnings. On the other hand, studies by Balakrishnan and Cohen (2013), Cheng et al. (2013) and Karuna et al. (2017) demonstrate a negative association between competition and earnings management, possibly alluding to '*race to bottom*' explanation according to which firms in competitive markets make inappropriate accounting choices to present a rosier picture.

A large body of literature documents that labor unions can extract above- market rents from firms and hence, managers of unionized firms have the incentive to signal a negative outlook to reduce such extraction. Managers do so by manipulating the expectations of analysts or by

⁸ Verrechia (1983) puts forward *proprietary cost theory*. Darrough and Stoughton (1990) and Wagenhofer (1990) put forward *entry deterrence theory*.

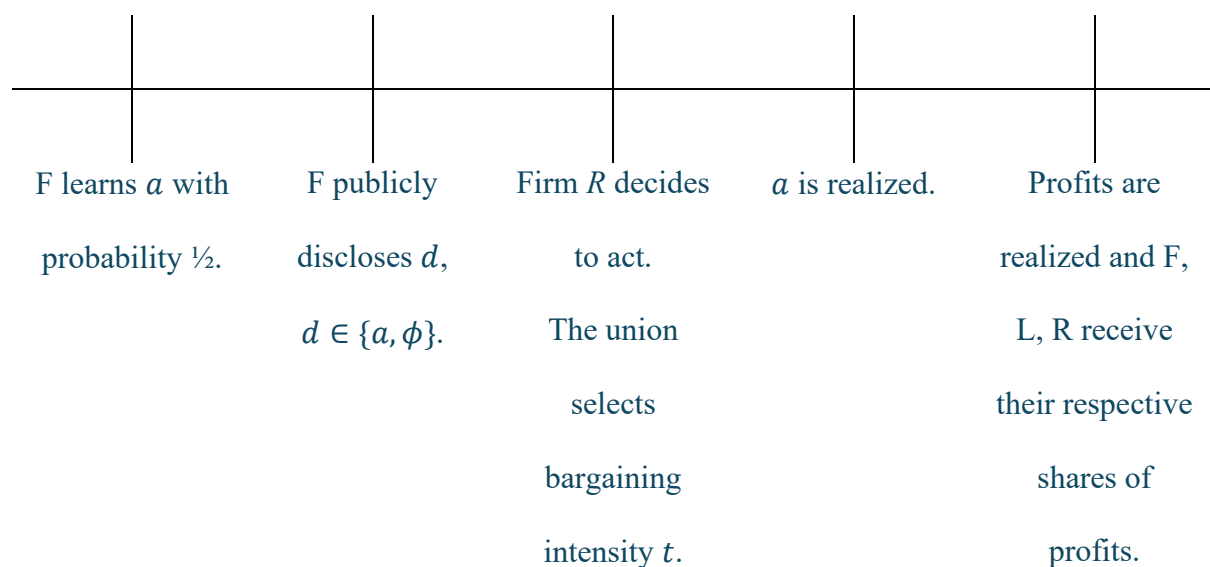
manipulating earnings, or a combination of both (Bova, 2013). Drawing from the model outlined by Fischer and Verrecchia (2000), Bova (2013) shows that managers may bias profitability signals either way, depending on the trade-off between benefits of missing analysts' expectations and costs associated with missing expectations. He documents that unionized firms miss earnings estimates and manipulate accruals around bargaining events with labor unions. Further, Chung et al. (2016) finds evidence of managers of unionized firms holding back good news around contract negotiations with unions. Aobdia and Cheng (2018) find that non-unionized firms put unionized peers under pressure prior to contract negotiations by releasing more information, particularly information that can be construed as 'good news'.

Prior to this set of empirical papers, a strand of literature touched upon superior leverage enjoyed by organized labor unions. Blanchflower et al. (1996) find that the amount of rent unions can extract is an increasing function of firm's profitability. Hirsch (1991, 2008) document the ability of organized labor unions to extract above market rents owing to better bargaining power they enjoy during contract negotiations. Another strand of literature reveals unionized firms engaging in income smoothing and accruals manipulation (Hamm, 2018), real earnings management (Chang et al., 2022) and tone management in earnings press releases (Ayaydin et al., 2018) to shelter firm's earnings from extractive labor unions. Performance understatement by managers in presence of labor unions finds further support in Baldwin (1983) and Grout (1984). Managers further seeks to shelter firm's resources from them by holding less cash (Klasa et al. 2009), holding more debt (Bronars and Deere 1991) and by decreasing frequency of good news disclosures (Chung et al 2016)

The literature on disclosure choices made by unionized firms and firms facing product market competition laid out so far is unidirectional in the sense that they largely document unionized firms and firms facing competition taking actions that signal a negative outlook to prevent value transfer from shareholders to employees or to deter product market competitor from

taking actions. This indeed is within the predictions offered by the analytical models in which firm must manage two countervailing forces with conflicting incentives- capital markets and an opponent who could be an existing rival, potential entrant *or* capital markets and a labor union. The equilibrium disclosure decision taken by the firm impounds the incentives of both capital markets and actions by an existing competitor or labor union. The literature is, however, silent on the type of disclosures made by a firm that faces union demands or other labor related threats *as well as* threats from a product market rival. We contribute to the literature by testing prediction of *AR* by examining the direction of disclosures a firm faces intense competition as well as extant threats from its employee base⁹.

We present the intuition behind the result of *AR* as follows. Consider a firm F, its product market rival R and its labor union L. The firm F gets a private signal about the future demand a with some probability p . Once the firm is informed of this signal, it can either truthfully disclose a (whether good or bad) or keep quiet as disclosure is subject to audit. Thus, firm F's disclosure is $d \in \{a, \emptyset\}$, where \emptyset denotes that firm has chosen not to disclose what it has observed (non-disclosure). Figure 1 below shows the timeline of the game.



⁹ Employee base can be unionized or ununionized. For the sake of exposition of mechanism in this section of the article, we consider a firm facing organized labor union as an example.

The labor union L observes the disclosure (good news or bad news or non-disclosure) and chooses its bargaining intensity t . Bargaining is costly and hence union's utility function is quasi-linear; linear, increasing in firm's profits, and quadratic, decreasing in bargaining intensity. So, a union must decide if it is beneficial at all to bargain hard based on what the firm discloses. Finally, consider the actions of the product market rival R . Based on the disclosure d firm R chooses whether to take strategic action or not. The decisions of the labor union and product market rival are simultaneous. Along the game, actual demand a is realized and each player get their share of profits. The manager of the firm must decide on the disclosure d early in the game such that firm value is maximized when profits are realized at a later stage. She must consider how the rival and union would behave based on her disclosure. AR shows that union's bargaining is increasing in value of disclosure (favorable news or less unfavorable news) and decreasing in intensity of competition. So, it is in the interest of the firm to disclose if it has good news, rather than withhold good news. Such an action would entice the rival to act, thereby disciplining the union indirectly from bargaining too aggressively. Good news disclosure induces the rival to make pricing and quantity decisions that reduce disclosing firm's profits. Reduction in profits weakens labor union's bargaining position and they desist from bargaining hard.

This brings the discussion to the testable hypothesis-

A firm facing labor related threats as well as product market competition is likely to reveal good news, although when faced with each individually, the firm withholds good news.

To the best of our knowledge, we are first to empirically test a setting predicted by Arya and Ramanan. To that end we contribute to the strand of literature that examines voluntary disclosures in face of multiple audiences. Our second contribution lies in introducing two entirely new measures to proxy of labor-related threats faced by a firm. Existing continuous

measures based on industry unionization rates assume labor's bargaining strength even if a firm has no union that bargains collectively on behalf of its employees (Hilary 2006). Existing binary measures of unionization fail to account for persistence of unionization among unionized firms and introduce lack of firm-level heterogeneity (Hamm 2018). The measures that we introduce are based on earnings calls and news articles abstracts away from presence of union and proxy for labor threats faced by a firm in general. They also introduce time varying heterogeneity in labor related threats faced by a firm emphasizing that a unionized firm may not always be facing labor threats, and a non-unionized firm may be facing labor threats arising out of issues that are labor union agnostic¹⁰.

3. Sample Construction, Key Variables and Descriptive Statistics

Sample Construction

To test the prediction of *AR24* we use a sample of US firms from 2009-2019. Our data comes from the intersection of quarterly Compustat (control variables), Hoberg and Philips product market fluidity dataset and management capex forecasts from I/B/E/S. Following convention we remove financial firms (SIC 6000-6999), firms with negative sales and assets, and firms whose financial year and calendar years do not converge in December. Also, we consider annual capital expenditure forecasts and keep the earliest quarterly forecast.

All continuous variables are winsorized at the top and bottom one percentile, and we allow for a full set of available controls. The final sample has 30392 observations across 1215 firms. Table 1 provides a brief description of our sample construction.

¹⁰ We also test the predictions of *AR24* using unionization measure proposed by Hamm et al. 2018 as a robustness check.

Table 1. Sample Construction

Particulars	Number of Firms	Observation
A) Compustat Sample	7363	167114
B) IBES Sample	3245	40649
C) Hoberg and Philips Sample	6981	46052
D) Earnings Calls (ECC) Sample	2403	61675
Final Sample: $A \cap B \cap C \cap D$	1215	30392

A. New Measures of Labor Related Threats

Existing measures of unionization, a key aspect of labour relations, often rely on industry unionization rates (Hilary, 2006) or simple binary indicators of union presence (Hamm, 2018). However, these measures fail to capture the nuanced and dynamic nature of labour threats faced by individual firms. For one, unionization and non-unionization tend to be persistent. That is, a unionized firm does not get un-unionized easily, and an un-unionized firm does not get unionized easily. Furthermore, a firm may be unionized but not necessarily facing significant labour-related challenges, or conversely, a non-unionized firm may encounter substantial labour issues. Simple binary measure of unionization or an industry unionization rate based measure does not capture such subtlety.

To address this gap, we propose two novel measures to quantify the threat a firm faces from labour-related issues. The first measure utilizes text data from earnings conference calls, capturing the qualitative aspects of labour discussions pertaining to strikes, layoffs/hirings and union negotiations. The second measure employs a TF-IDF based approach to compute the proportion of an earnings conference call devoted to labor related topics. A third measure (that we introduce as a robustness check later) leverages sentiments of labour-related news events like hiring/layoffs, strikes, workforce salary, union pacts, resignations etc. related to a firm. Through these measures, we aim to provide a more nuanced understanding of the labour issues

related threats faced by firms. We begin with discussing the lacunae of earlier measures and explain how our measures seek to address them.

The first attempt at arriving at a firm specific measure of unionization or labor related threats involved multiplying the industry unionization rate (available from Bureau of Labor Statistics) with labor intensity, which is the ratio of the number of employees to total assets of a firm (Hilary, 2006). The measure so created is proxy for strength of labor and is agnostic to whether a firm is unionized or not. The assumption is that firms from the same industry would be under comparable pressure from unions, and any industry wide impact would be firm specific.

The next measure proposed by Hamm et al. (2018) requires textual analysis of a firm's business description (item 1) and risk factor disclosures (item 1A) from 10Ks to come up with a set of keywords related to unionization of a firm. The measure is binary, in which the presence of a related keyword(s) or phrase(s) in a firm's 10K implies that firm is unionized. This is a more generic measure and addresses the concern of the previous measure created by Hilary (2006) that validity of an industry specific measure weakens if a firm is not unionized.

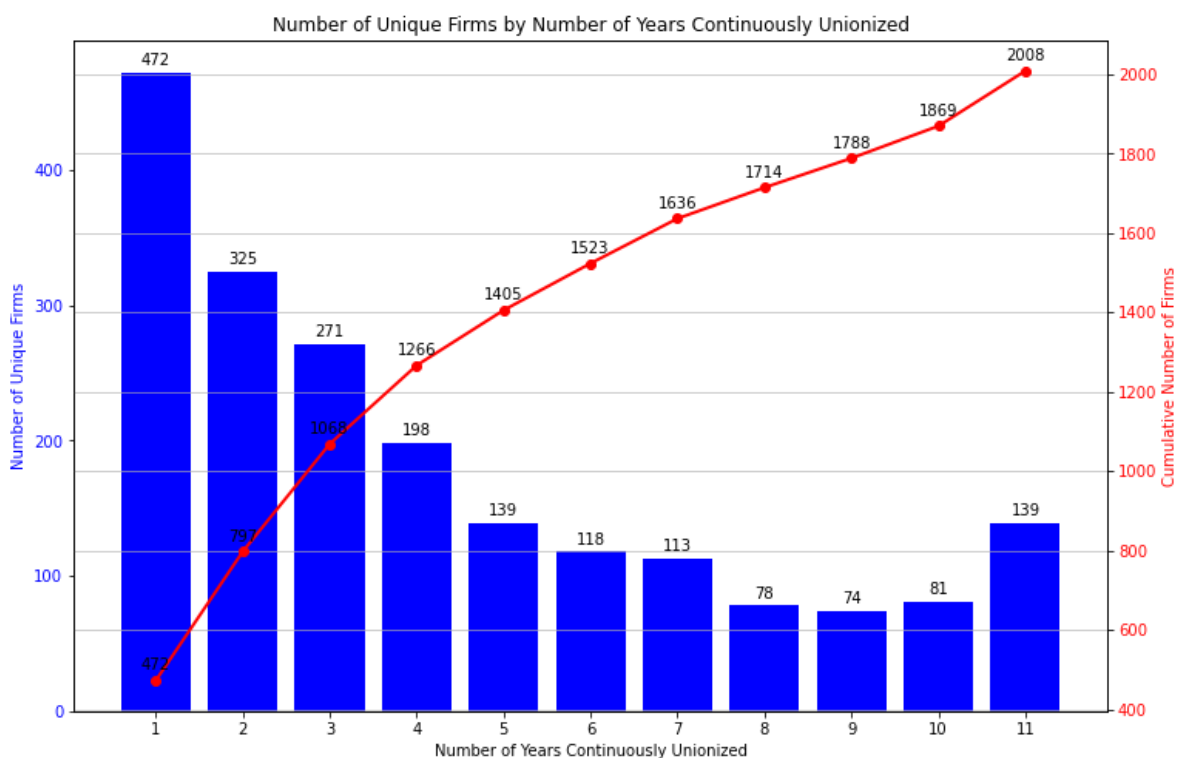
Hamm et al., (2018) report that there could be divergence between firm specific union membership and industry unionization rate (p. 1207) computed by Hilary (2006). Although Hamm et al., provide a more generic and 'cleaner' firm specific version of unionization (a binary variable that takes the value 1 if firm is unionized in a given year, 0 otherwise), we find that firm unionization & non- unionization is highly persistent. The number of firms that are unionized in Hamm's sample is 20%, and many of these firms show no heterogeneity in unionization across time, that is, they stay unionized all throughout the sample (example, General Motors).

We analyse a sample of 10,917 Compustat firms between 2009-2019 (Figure 1), and find that 8,909 firms stay non- unionized throughout, and 2,008 firms (18%) stay unionized for at least

one year during the sample period. This unionization rate is close to the 20% reported by Hamm et al., for their sample from 1996-2014.

As evident from the Figure 2, even among firms that are unionized, 30% (603 out of 2008) stay continuously unionized for more than 6 years or more out of the 11 years in the sample, i.e. a value of 1 for the variable *UNION_DUMMY* for these firms for more than half of the sample period, 0 otherwise. This persistence leads to a sample where there is a heavily lopsided clustering of the *UNION_DUMMY* variable¹¹. Any research question that needs to exploit heterogeneity in labor related issues at a more granular level, say quarterly, would have to make use of mis-specified regression, as unionization measure is at the year level.

Figure 2: Persistence in Unionization Among Unionized Firms in Compustat Sample



¹¹ For example, firms like General Motors, American Axle etc. have *UNION_DUMMY*=1 for all years in the sample.

Secondly, as within firm heterogeneity¹² is not substantial for a considerable number of firms in the sample, regression results are prone to misinterpretation. Finally, the use of labor strength or firm specific unionization does not inform us of labor related issues faced by firm as perceived by managers and external observers, that are likely to be more pressing or/and spread out over time.

We seek to address the above concerns and propose three new measures that quantifies imminent labor threats faced by firms as perceived by managers arising out of labor related issues and labor threats facing a firm as observed in news media by external entities. To reiterate, the first measure is based on text analytics of quarterly earnings calls, and it is a binary measure created using a Bag of Words (BOW) approach of keyword matching. The second measure is again created from earnings call transcripts, using machine learning based computational linguistic technique. The third and final measure is based on sentiments of news events pertaining to myriad labor related issues.

Quarterly Earnings Conference Calls (ECC) Based Measure

A. Binary Measure of Labor Related Threat using Bag-of-Words Approach

Earnings calls following earnings press releases are important information events in capital markets [Frankel et al. 1999, Bowen et al. 2002, Bushee et al. 2003, Kimbrough 2005]. Extant literature [Matsumoto et al., 2011] documents that earnings conference calls are incrementally more informative than the accompanying earnings press release primarily because of the manager's presentation that aids in more voluntary disclosure, and presence of analysts who uncover more information through questions, which managers provide answers to. We leverage

¹² In Appendix D, we show results from OLS with firm-year fixed effects instead of industry-year fixed effects using Hamm's measure and our two new measures.

this quality of earnings conference call to create our unique measure of threats arising out of labour related issues.

We examine the occurrence of strikes, layoffs, and labour union related discussions in earnings conference calls to arrive at binary measure of labour issue related threat. In any given quarter a firm might talk about any one of these threats, none of these threats or a combination of these threats. On a continuum of threat perception from no discussion of any labour related threat to discussing all three in a conference call, we say that a firm is facing an '*imminent*' labor threat from labour related issues if it discusses all the above three topics in its quarterly earnings conference call. This new measure proxies for those labor related events that managers perceive to be pressing in nature, and perhaps cannot ignore.

A manager can discuss about strikes, layoff and union related issues either voluntarily or as a response to questions of analysts. Our measure does not distinguish between the two. Any discussion of these topics can be an outcome to either ongoing issues the firm might be facing or potential issues that firm might face. Whether voluntary or involuntary, discussion of these issues indicates that either the manager is concerned about threats arising from strikes, layoffs and union negotiations, or the analysts consider such issues to be pertinent and are seeking the response of managers. For example, strikes can lead to work stoppages and can trigger pushback from unions. Strikes at a firm's supplier or at a peer firm can also be a matter of concern for the firm as there could be impact from any spillover and firm's profits might be affected. Similarly, layoffs, whether firm specific or due to economy wide factors, can trigger labor unrest and they can ask for firms to reconsider its decisions that might impact the bottom line. And finally, labor union negotiations usually involve unions asking for better wages, benefits and working conditions that has the potential to whittle away much of firm's profits. The presence of any one threat may or may not represent a very pressing concern, but the

presence of all of these in a single conference call is likely an outlier event and manager can no longer ignore it, nor the analysts would allow the managers to hand wave over the issue.

To arrive at our measure, we do a Google search of earnings conference calls for unionized as well as non-unionized firms in our sample and read them to come up with a set of keywords and phrases pertaining to strikes, layoffs and union related issues¹³. Following manual reading of a random set of earnings conference calls, we create a set of keywords and phrases for strike, layoff, and union related labour issues. Table 2 below provides a comprehensive list of keywords and phrases that we come up with along with acronyms of labor unions.

Table 2. Set of Keywords for Strikes, Layoffs, Union and Acronyms Names of Labor Unions Obtained from Reading Earnings Conference Calls.

<p><u>Strike related keywords and phrases:</u> impact of strike, impact of the strike, impacted by strike, impacted by the strike, strike impact, strikes impact, impact from strike, impact from the strike, uaw strike, about strike, ongoing strike, any strike impacts, impacts from the strike, strikes will negatively impact, strikes will cost, strikes to cost, strike to cost, went on a strike, went on strike, called a strike, called strike, strike called by, strikes called by, strikes by union, strike by union, labor strike, union called strike, union called a strike, work stoppage.</p> <p><u>Layoff related keywords and phrases:</u> layoffs, lay off, laid off, job cut, down size, downsize, downsizing, down-sizing, right size, right size, right sizing, rightsizing, right-size, hiring freeze, fire, fires, firing, employees.</p> <p><u>Union related keywords and phrases:</u> union, collective bargaining, collectively bargain, labour organization, labor organization, employee organization, worker organization.</p> <p><u>Acronyms of Labor Unions Names:</u> ATU, OPEIU, AFSCME, CNA, UPTE, UCSW, AFT, BCTGM, CNN, NUHW, IUOE, NNU, IUOE, CTU, SEIU, CWA, IBEW, DFT, GEO, HGSU, UAW, IAM, IAMAW, IBT, IFPTE, ILWU, ILA, BAC, IUPAT, LIUNA, UBC, LCFT, LEAD, MNA, NFLPA, SCTA, ATU, SMART, SMWU, APSCUF, TWU, UICUF, UA, UBT, UE, UFCW, UFCWU, UNITE HERE, USW, USS, UPTE-CWA, UWA, WVEA.</p>
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We source earnings conference call transcripts from Capital IQ and programmatically check under three headings- strike, layoff and union keywords and phrases occur in the transcript or

¹³ A sample Google search phrase looks like “Ford Earnings Conference Call Strike”, “General Motors Earnings Conference Call Layoff”, “American Airlines Earnings Conference Call Labor Union” etc. We read earnings conference calls transcripts of 10 unique firms each for strike, layoff, and union related keywords. Overall, we read 30 earnings conference call transcripts.

not. If yes, we code it as 1, else 0 for each heading. For example, if the words “strike”, “right size” and “collective bargaining” occurs in the transcript, then all the three columns- strike, layoff and union take the value 1. If any one or two occur, then those columns take the value 1 and the third one stays 0. We programmatically analyse 61,675 quarterly earnings conference call transcripts of 2,403 firms¹⁴.

In the second step we take the subset of observations in which threat from strike and threat from layoff is still 0. For those observations in which threat from strike is 0 we parse the files again to see if any of the labor union acronyms¹⁵ or the words “loss from”, “negative” or “loss” occur in the same sentence or not. If they do, we recode threat from strike to 1 from 0, for these observations. For those observations in which threat from layoffs is 0 we parse the files again to see if the words “fire”, “fires”, “firing” occurs in the same sentence with “employees” or “work-force”, “workforce”. If they do, we recode threat from layoff to 1 from 0. Table 3 provides a descriptive statistic of the measures created.

Table 3 shows that 9%, 9% and 6% of the firm quarter observations are those in which firms face some kind of strike, layoff, or union related threats. This corresponds to 1696, 1677 and 1279 unique firms out of 2403 firms that face strike, layoff, or union threat in some quarter or the other respectively. 286 firms face all the above threats (*IMMINENT*) in some quarter or the other. This implies that labor related threats are more spread out across firms and time than simple firm level unionization would suggest.

¹⁴ A random search of 20 transcripts with the word “strike” in them did not throw up any instance of homonyms like “It does not *strike* me to be on the lower side...”. Although we do not completely rule out the existence of such homonyms in at least some transcripts.

¹⁵ These acronyms stand for the labor unions that are active in the US. For example, UAW stands for United Auto Workers. We also ensure that all acronyms, keywords, and phrases under each heading is searched for in a case agnostic way to adjust for any errors of transcription.

Table 3. Descriptive Statistics of Earnings Conference Call Based Measures

	N	Mean	Std	Min	25%	Median	75%	max
STRIKE	61675	0.09	0.29	0	0	0	0	1
LAYOFF	61675	0.09	0.28	0	0	0	0	1
UNION	61675	0.06	0.24	0	0	0	0	1
IMMINENT	61675	0.01	0.08	0	0	0	0	1
LABOR_RISK1	61675	2.7	4.0	0	0	1.4	3.7	68.5
LABOR_RISK2	61675	4.0	6.3	0	0	1.8	5.5	88.8

Distribution of each type of threat over a larger set of firms and quarters addresses concern discussed earlier about persistence of unionization and inability to analyse impact of labor related threats that are sporadic, sudden and pressing in nature.

B. Continuous Measure of Labor Related Threat (Risk) using Machine Learning

The keyword/phrase matching approach that we use to create the variable *IMMINENT* from earnings conference call is a rudimentary application that does not consider the labor related risks that always lurks in the background that firm deals with. The binary nature of *IMMINENT* is such that it captures only the pressing labor threats faced by a firm, and one might have a concern that threat of strikes, mass layoffs, breakdown of negotiations with union etc. individually can also become pressing, without the need to have all of them happening at the same time. Further, potential threats from the labor force are always there. To address these concerns, we introduce a machine learning based measure of labor related threat that is continuous and offers an idea of ongoing levels of labor related risks faced by the firm.

We focus on the proportion of conversation around labor related issues in a conference call. Any labor related issue raised must be of some concern to the firm's management or the analysts participating in the call. In Bag-Of-Words (BOW) approach of matching keywords, we had apriori decided upon a list of words and phrases to search for, based on random readings of earnings conference calls. Now, we don't decide upon the words beforehand or make

exogenous judgement on which words or phrases may be associated with labor related and non-labor related topics. We instead borrow a technique from computational linguistics called pattern-based-sequence-classification (Song and Wu 2008, Manning et al. (2008)). We pick up language patterns specific to labor related topics and non-labor related topics, and that allows us to compute the proportion of the conversation devoted to labor related topics in an earnings conference call.

To compute a measure of labor risk, we adapt the methodologies described in Hassan et al. (2018) in which they compute a measure of political risk from earnings call transcripts. We first create a training library of labor bigrams (two-word conjunctions) that are typical of conversations pertaining to labor issues¹⁶. We extract such labor related bigrams from a textbook on Labor Economics (Contemporary Labor Economics by Connel, Brue and Macpherson, 12E). Similarly, we also create a training library of non-labor bigrams for conversations that are not related to labor issues. For this purpose, we use an MBA level financial accounting textbook (Financial Accounting by Libby, Libby and Hodge, 11E)¹⁷.

To ensure robustness of our inferences using machine learning based measure, we create another variation of labor related threats. We use speeches of President and Vice President of AFL-CIO to create a separate library of labor related bigrams.¹⁸ The American Federation of Labor and Congress of Industrial Organizations is the largest federation of labor unions in the USA representing 60 labor unions and 12 million workers. The speeches culled from their website are tagged across 19 categories including but not limited to “Better Pay and Benefits”, “Labor Laws”, “Right to Work Laws”, “Manufacturing”, “Gender Equality”, “Corporate

¹⁶ Take for example the bigram *union negotiations*. This bigram is more likely to occur in conversations around labor issues, compared to non-labor issues.

¹⁷ Hassan et al. (2018) uses American Politics Today by Bianco and Canon, 3E for extracting political bigrams and Financial Accounting by Libby, Libby and Short, 7E for extracting non-political bigrams.

¹⁸ Speeches are scraped from <https://aflcio.org/speeches>

Greed”, “Workplace Safety” etc. These speeches are usually at various events and offer us an opportunity to analyze the vocabulary of union leaders who hold forth on various issues that are important to them. These issues can have wide ramifications and are usually contemporary.

Once the training libraries of bigrams is created, we decompose each earnings call transcript into bigrams. Then we count the number of occurrences of labor related bigrams within ten words surrounding risk, threat and uncertainty on either side of the bigram, and divide by total number of bigrams in the call transcript. The measure $LABOR_RISK$ is given by-

$$LABOR_RISK_{i,t} = \frac{\sum_b^{B_{i,t}} (I[b \in L \text{ but not } N]) \cdot I[|b - risk| < 10] \cdot \frac{f_{b,L}}{B_L}}{B_{i,t}}$$

Where, $I[.]$ is an indicator function, that takes the value 1 if a bigram is a labor bigram (first term in the numerator), 0 otherwise; takes the value 1 if the distance of the bigram from “risk”, “uncertainty” or “threat” is less than 10 words ,0 otherwise (second term of the numerator).

The third term $\frac{f_{b,L}}{B_L}$ is the frequency of occurrence of a labor related bigram in the corpus of labor bigrams. In text classification literature, $(I[b \in L \text{ but not } N]) \cdot \frac{f_{b,L}}{B_L}$ is commonly known as Term Frequency- Inverse Document Frequency (TF-IDF) of the bigram. It measures the relative importance of a bigram in a corpus of bigrams. The higher the values of TF-IDF the more important the bigram is within the corpus. The computation above is a standard one in the literature except for our specific conditioning on the existence of bigrams within the context of risk, threat and uncertainty.

In Table 3 presented earlier, we multiply the measures $LRISK1$ and $LRISK2$ by 10^4 and use the value $LABOR_RISK1$ and $LABOR_RISK2$ in our empirical tests¹⁹. The mean of $LABOR_RISK1$ is 2.7 which is scaled up from 0.00027. Similarly, the measure $LRISK2$ is computed from

¹⁹ This is in line with Hassan et al. (2018). Otherwise, proportions are miniscule of the order 10^{-4} or less.

bigrams of union leaders' speeches. We again multiply it by 10^4 and use *LABOR_RISK2* in our logistic regressions. The mean of *LABOR_RISK2* is 4. The maximum values are *LABOR_RISK1* and *LABOR_RISK2* 68.5 and 88.8 which corresponds to *LRISK1* and *LRISK2* of 0.00688 and 0.00888 respectively. One can interpret it to be that at the maximum values of labor risk, about 0.7%-0.9% of the conversation revolves around discussions related to labor related issues. Table 4 provides a sample of 20 non labor related bigrams from accounting textbook and 40 labor related bigrams- 20 from labor economics textbook and 20 from speeches of union leaders.

Table 4. Sample of Labor and Non-Labor Bigrams

Sample of 20 Non-Labor Bigrams

cash flows, operating investing, flight equipment, business decisions, accounting purposes, primary financial, trademark purchased, important insight, is expected, residual value, mental costs, economically during, estimated useful, public company, industry ratio, the sec, the following, the amount, coupon rate, did not.

Sample of 40 Labor Bigrams (20 from Textbook, 20 from Speeches)

wage decline, work increase, of retirement, incentive for, workers were, many pension, trained employee, marginal revenue, wage expense, redistributive effects, heated political, unions alternatively, job safety, labor productivity, greater consequence, female unemployment, is required, paying positions, discrimination merit, earnings mobility.

communities are, money influence, can demand, speechless Donald, raising wages, earnings over, working people, our unions, dialogue quickly, inclusive growth, working conditions, on strike, the groundswell, worker from, the power, union up, members who, healthy and, fairer economic, connect workers.

B. Measure of Existing Competition

We lean on extant literature for our measure of existing competition. For existing competition, we use product market fluidity (*PMF*) measure created by Hoberg et al. (2014)²⁰. Hoberg et al. analyze the product description of 10Ks, and their measure of competitive threat focuses on

²⁰ The measure is available from their website, <https://hobergphillips.tuck.dartmouth.edu/>.

the activities of the rivals by directly measuring “...the change in a firm’s product space due to moves made by competitors in the firm’s product markets.” This ex-ante measure of competition highlights the ongoing product market threat faced by a firm. Hoberg et al. (2014) define product market fluidity as-

$$PMF = N_{i,t} \cdot \frac{D_{t-1,t}}{\|D_{t-1,t}\|}$$

Where $N_{i,t}$ is the firm’s own normalized word vector and the normalized $D_{t-1,t}$ is the overall change in use of words from previous year. Product market fluidity, as defined by Hoberg et al. (2014), captures the annual change in a firm's product space by analysing the language used to describe its products in the 10-K report²¹. This measure compares the firm's product space with that of other firms, indicating the extent of overlap and, consequently, the level of competition. The dot product is essentially a cosine similarity of a firm’s own word’s usage and aggregate change vector. Fluidity lies between [0,1] and is multiplied by 100 for convenience. A higher overlap (higher PMF score) suggests increased competitive threats. Importantly, since product market fluidity relies on 10-K reports, which are mandated to be current and updated, it provides forward-looking information that extends beyond historical accounting data²².

C. Measure of Good News

We proxy for good news using a binary variable $PSURP$ (short for positive surprise), that takes the value 1 if management’s capital expenditure (capex, henceforth) forecast exceeds analysts’ consensus, 0 otherwise. Since we test for likelihood of positive surprise, we also consider firms that do not disclose, and we code $PSURP$ to be 0 for such non-disclosing firms. If the manager

²¹ We assume that a firm’s existing product market does not undergo any significant changes in a quarter.

²² Existing measures that are inaccurate proxies for product market competition like Herfindahl-Hirschmann Index (HHI), Four Firm Concentration ratios etc. use sales data.

gives a range guidance, we take the mid-point of the range. Capex forecasts tend to have a flavor of tangibility and permanence, as available funds are spent on tangible expansion by purchase of capital assets. Spending on capex also signals that the firm believes that a high state of the world would persist into the future and the net positive opportunity set available is not going to be short term. Compared to earnings or sales forecasts that can be affected by vagaries of short-term goals and exogenous fluctuations, capex forecasts must be well thought out as firms are usually not able to get out of investments quickly. Prior research has also documented that capex forecasts act as a barometer of managerial reputation and capex increases has positive market price reactions²³. High capex forecasts indicate that the firm's prospects are positive and since capital expenditures disclosures are subject to audit, it signals commitment. We consider annual capex forecasts given by a firm in our main tests.

D. Control Variables

We use a battery of control variables informed from existing literature on capex forecasts, product market competition, and labor unions. Following prior studies (Li, 2010; Lu and Tucker, 2012; Bova, 2013, Vashishtha, 2014; Ali and Fan, 2022), we control for size of the firm (*SIZE*) which natural logarithm of firm's market value, Tobin's Q (*TOBINQ*), asset tangibility (*TANGIBLE*), industry Herfindahl Hirschman Index (*IND_HHI*), stock return (*RETURN*), volatility of returns (*RETVOL*), volatility of capital expenditures (*CAPXVOL*), presence of a big 4 auditor (*BIG4*), level of debt (*LEVERAGE*) and an indicator variable if returns in the previous quarter was negative (*BADNEWS*). Table 6 provides descriptive statistics for the final sample.

²³ See McConnell and Muscarella (1985), Chan et al. (1990, 1994), Hirschleifer (1993), Chung et al. (1997), Brailsford and Yeoh (2004).

Descriptive Statistics

From Table 6 the mean(median) value of *PMF* is 6.39 (5.63) respectively. As a comparison, the mean(median) *PMF* of 6.9(6.3) is reported by Hoberg et al. (2014) for their sample. About 12% (*PSURP*=0.12) of the capex guidance exceeds analysts' forecasts. 52.3% of capex forecasts are point forecasts rather than range forecasts²⁴.

Table 6. Descriptive Statistics for Merged Compustat/IBES, Earnings Conference Call Samples

	N	min	p25	mean	p50	p75	max	sd
PSURP	30392	0.00	0.00	0.12	0.00	0.00	1.00	0.33
PMF	30392	1.31	3.90	6.39	5.63	8.13	16.37	3.38
IMMINENT	30392	0.00	0.00	0.01	0.00	0.00	1.00	0.08
LABOR_RISK1	30392	0	0	2.23	1.10	3.23	49.98	3.26
LABOR_RISK2	30392	0	0	3.31	1.54	4.71	88.255	5.03
TOBINQ	30392	0.80	1.26	2.35	1.71	2.72	10.56	1.77
TANGIBLE	30392	0.01	0.08	0.29	0.19	0.46	0.91	0.26
IND_HHI	30392	3.66	9.08	20.53	11.71	19.46	156.55	23.93
LEVERAGE	30392	0.00	0.12	0.28	0.26	0.39	0.97	0.21
RETURN	30392	-0.48	-0.07	0.04	0.04	0.14	0.76	0.20
RETVOL	30392	0.05	0.12	0.23	0.18	0.25	2.07	0.24
CAPXVOL	30392	0.31	7.80	178.22	29.05	110.20	3349.92	457.26
SIZE	30392	4.79	6.99	8.04	7.87	9.01	12.11	1.52
BIG4	30392	0.00	1.00	0.92	1.00	1.00	1.00	0.27

²⁴ Ali and Fan (2024) also report that 94% of capex forecasts are annual and 54% of annual forecasts are point forecasts. In our IBES sample 96% of capex forecasts are annual.

BADNEWS	30392	0	0	0.40	0.00	1.00	1.00	0.49
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4. Empirical Tests Using New Measures

Earnings Call Based Labor Threat

We test the hypothesis that a firm facing competitive threats from existing rivals as well as labor threats is unlikely to withhold good news. We run logistic and OLS regression with *PSURP* as our dependent variable²⁵. We expect that the coefficient on existing competition proxied by *PMF*, and labor related threat proxied by *IMMINENT* would have a negative sign and significant, but their interaction would be positive and significant. The logistic regression specification is as follows-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot IMMINEENT_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot IMMINEENT_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

We use industry fixed effects γ_j and year fixed effects θ_τ to control for time-invariant industry characteristics and time trend due to macroeconomic conditions. Standard errors are adjusted for Newey-West heteroscedasticity and autocorrelation to allow for correlated forecasting behavior across time²⁶. Table 6 presents the output of the regression. Columns 1 and 2 provide results for logistic regression without and with controls respectively. In column 1 the coefficient on *PMF* is -0.0732, significant at 1% level. A firm facing product market competition is unlikely to disclose good news. The coefficient on *IMMINENT* (-0.818) is also significant at the 5% level. Now we focus on the interaction term. The interaction term *PMF*IMMINENT* is positive (0.142) and statistically significant at 5% level. Thus, a firm facing both labor related

²⁵ We avoid writing *PSURP* in log of odds ratio format, i.e. $\log(p/1-p)$ for the sake of brevity.

²⁶ Clustering standard errors on firms does not change our coefficients but level of significance drops.

threats and product market competition individually is likely to withhold good news, but in their joint presence the firm may disclose good news.

Table 6. Logistic Regression of Good News, Competition and Labor Threats (ECC)

VARIABLES	(1) PSURP	(2) PSURP
PMF	-0.0732*** (0.00721)	-0.0631*** (0.00757)
IMMINENT	-0.818** (0.407)	-0.888** (0.440)
PMF*IMMINENT	0.142** (0.0561)	0.151** (0.0632)
Constant	-1.219*** (0.181)	-4.285*** (0.413)
Observations	30,392	30,392
Industry FE	Yes	Yes
Year FE	Yes	Yes
Controls	No	Yes
Clustering	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) without controls and (column 2) with controls for the regression model-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot IMMINENT_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot IMMINENT_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *IMMINENT* is a binary variable that takes the value 1 if all or some of the strike, layoff and union related keywords and phrases occur in a call, 0 otherwise. The double interaction term *PMF*IMMINENT* is the main variable of interest. Both the columns include industry-year fixed effects at two digits SIC, and robust standard errors.

In terms of economic significance (interpreting column 1 coefficients), when a firm faces labor threat (*IMMINENT*=1), interquartile range movement in competition (*PMF*) increases the odds ratio of *PSURP* by 41% (0.55 vs 0.77)²⁷. To reiterate, when firms are not facing any labor issues, we see that they avoid disclosing good news as predicted in extant literature. But the joint presence of rivals as well as labor threat weakens this tendency of withholding good news.

²⁷ $PMF = 3.09$ (25th percentile value) and 8.13 (75th percentile value). So $e^{(-0.0732 \cdot 3.09 - 0.818 \cdot 1 + 0.142 \cdot 3.09 \cdot 1)} = 0.55$ and $e^{(-0.0732 \cdot 8.13 - 0.818 \cdot 1 + 0.142 \cdot 8.13 \cdot 1)} = 0.77$.

We further test our hypothesis using machine learning (TF-IDF) based measure of labor related threat (risk). We employ the following logistic specification-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot LABOR_RISK_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot LABOR_RISK_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Where, *LABOR_RISK* can either be *LABOR_RISK1* or *LABOR_RISK2* depending on whether we are testing the theory using labor related bigrams extracted from labor economics textbook or AFL_CIO speeches respectively.

Table 7 Column 1 presents output from logistic regression using *LABOR_RISK1*, and Column 2 presents output from logistic regression using *LABOR_RISK2*. All regressions employ a full set of controls, industry year fixed effects and robust standard errors. In both columns 1 and 2, competition loads with a highly significant (at 1%) negative coefficient. The measures of labor risk also load significantly at 5% levels. The interaction terms in both the columns are positively significant at 5% level.

As evident from columns 1 and 2, the coefficients of the interaction term are almost zero (0.005 and 0.003). While our measures of labor risk capture the underlying construct, its prominence does not seem to emerge in terms of economic impact. The simple presence of labor risk in the backdrop is not enough to force a manager's hand when it comes to disclosures. This ties up with our earlier measure *IMMINENT* when we documented that managers are unlikely to withhold good news when labor related threats are pressing and are not manageable anymore through usual channels of negotiations.

Table 7. Logistic Regression of Good News, Competition and ML based measure of Labor Related Threats from Earnings Conference Calls (ECC) Sample

VARIABLES	(1) TEXTBOOK	(2) SPEECHES
PMF	-0.0733*** (0.00858)	-0.0729*** (0.00846)
LABOR_RISK1	-0.0301** (0.0125)	
LABOR_RISK2		-0.0197** (0.00801)
PMF*LABOR_RISK1	0.00476*** (0.00170)	
PMF*LABOR_RISK2		0.00317*** (0.00115)
Constant	-4.316*** (0.415)	-4.309*** (0.415)
Observations	30,392	30,392
Industry FE	Yes	Yes
Year FE	Yes	Yes
Controls	Yes	Yes
Clustering	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) without controls and (column 2) with controls for the regression model-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot LABOR_RISK_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot LABOR_RISK_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *LABOR_RISK1* and *LABOR_RISK2* continuous variables between 0 and 1. The double interaction terms *PMF*LABOR_RISK1* and *PMF*LABOR_RISK2* are the main variable of interest. Both the columns include industry-year fixed effects at two digits SIC, and robust standard errors.

In the next test we partition the labor risk measure at their 95th percentile and code values above 95th percentile to be *HI_RISK1* and *HI_RISK2* for our textbook and speech-based measures respectively. We do this to check if higher levels of labor-related risks start to move the needle when it comes to managers making strategic disclosure choices. Table 8 provides the output from our logistic regression of running *PSURP* on *PMF*, *HI_RISK1* and *HI_RISK2* for textbook and speech-based measures.

Again, competition and both measures of risk load negatively significantly. The coefficient on *PMF* is -0.066 and -0.065, and the coefficients on *HI_RISK1* and *HI_RISK2* are -0.551 and -0.421 respectively. The coefficients on respective interaction terms are 0.0836 and 0.0652. One interquartile range change in *PMF* increases the odds ratio of *PSURP* by 9%²⁸.

Table 8. Logistic regression of Good News, Competition and Measure of Labor Risk at 95th percentile

VARIABLES	(1) TEXTBOOK95	(2) SPEECHES95
PMF	-0.0668*** (0.00764)	-0.0654*** (0.00763)
HI_RISK1	-0.551*** (0.184)	
HI_RISK2		-0.421** (0.178)
PMF*HI_RISK1	0.0836*** (0.0236)	
PMF*HI_RISK2		0.0652*** (0.0243)
Constant	-4.355*** (0.415)	-4.351*** (0.415)
Observations	30,392	30,392
Industry FE	Yes	Yes
Year FE	Yes	Yes
Controls	Yes	Yes
Clustering	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) without controls and (column 2) with controls for the regression model-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot HI_RISK_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot HI_RISK_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *HI_RISK1* and *HI_RISK2* binary variables that takes value of 1 if *LABOR_RISK1* and *LABOR_RISK2* are at their 95th percentile level, 0 otherwise. The double interaction terms *PMF*HI_RISK1* and *PMF*HI_RISK2* are the main variables of interest. Both the columns include industry-year fixed effects at two digits SIC, and robust standard errors.

²⁸ $e^{(-0.668 \cdot 3.09 - 0.551 \cdot 1 + 0.0836 \cdot 3.09 \cdot 1)} = 0.606$ and $e^{(-0.668 \cdot 8.13 - 0.551 \cdot 1 + 0.0836 \cdot 8.13 \cdot 1)} = 0.663$.

Thus, based on our two measures of labor related threats- the binary and continuous, we infer that when firms face product market rival and labor related threats individually, they are unlikely to disclose good news, but in their joint presence, incentive to withhold good news weakens, and firm discloses good news. Further, the strategic withholding or disclosing of information is not driven by mild ongoing labor threats but by severe, unmanageable risks.

5. Robustness Tests

Raven Pack News Event Based Measure

Raven Pack Analytics (RPA henceforth) provides detailed analytics of news like sentiment of news articles, impact of news on short term volatility etc. from thousands of different news outlets across 23 categories. We download data pertaining to “labor-issues” for firms in USA. Following prior literature (Bushman & Pinto 2024), we filter out news types that are news flashes and tabular material.²⁹ The category of labor related issues covers 23 different types of labor related news like layoffs, hirings, compensation, union negotiations, resignations, workforce salary etc. News organizations report about ongoing labor related issues, and the sentiment in such news captures the underlying labor conditions, management- labor relation etc. that the manager of the firm is navigating. Examining the sentiment of the news allows us to look at labor related threats faced by a firm as perceived by media and public. Also, it acts as a proxy for those scenarios in which manager fails to handle labor related issue and it spills into the public domain.

RPA provides two measures of news sentiment - Composite Sentiment Score (CSS) and Event Sentiment Score (ESS). Each of these scores captures aspects of a news event from multiple

²⁹ Unlike Bushman and Pinto (2024), we do not filter out events that have relevance score for firm greater than 75. Relevance score measures how relevant a news event is to a particular firm. Labor related issues tend to have industry specific character and any labor related issue afflicting one or a group of firms in the industry can have a spillover effect on other firms in the industry.

points³⁰. From definitions it would be apparent that ESS measures entity level sentiment, and CSS measures story level sentiment. CSS is a score between -1.00 and +1.00³¹, combines various sentiment analysis techniques, including emotionally charged words and phrases, and expert-rated short-term share price impact. CSS strength (above or below 0) is determined using intraday stock price reactions from around 100 large-cap stocks. CSS combines 5 sentiment analytics using rules to ensure no sentiment disagreement exists. Trained on market data, CSS reflects how positive or negative a story is and is typically used for short-term signals in trading strategies.

ESS is a granular score between -1.00 and +1.00, representing news sentiment for entities. It is determined by systematically matching stories categorized by financial experts as having short-term positive or negative financial impacts. The score is based on consensus-based ranges and factors like actual versus estimated figures, ratings, magnitudes, and emotionally charged language. ESS algorithms also consider information from brokerage firms, investment banks, and credit rating agencies. For example, they differentiate analyst actions like downgrades and compute percentage changes between actual figures and benchmarks disclosed in the story.

We compute a firm-quarter measure by averaging each of these sentiment scores by firm and quarter across various categories and obtain data for 5251 firms across 63131 quarters. Positive mean scores likely signal hirings, successful union negotiations, better management labor relations etc., while negative mean scores indicate labor related distress, layoffs, strike, etc. Figure 3 shows sample distribution of the measures.

Figure 3 shows that ESS measure is highly skewed. 74% of the news articles have a positive sentiment and 22% have negative sentiment. Mean (median) ESS score is 0.23 (0.44). This implies that not all labor related news has a negative connotation. A substantial portion (27%)

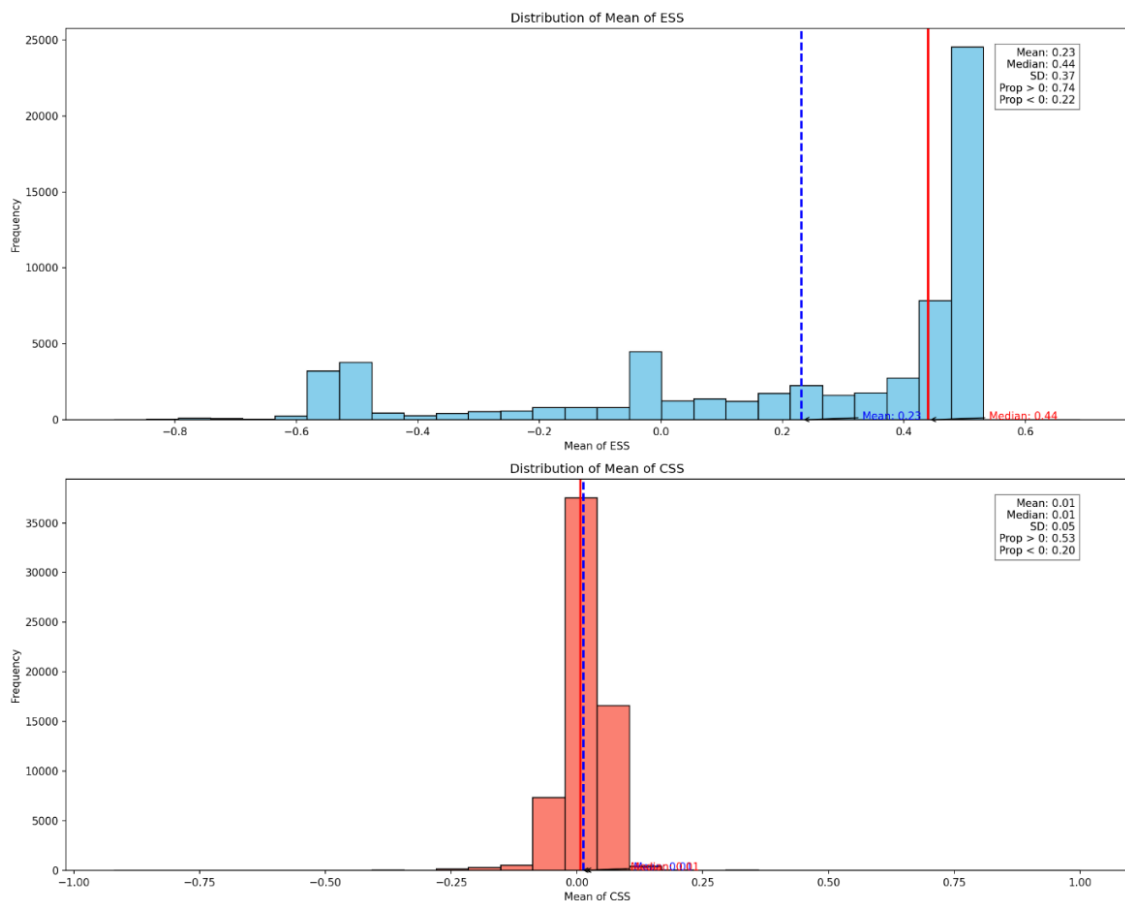
³⁰ Refer to Raven Pack User Guide.

³¹ The RPNA4.0 provides CSS scores that are between 0 and 100.

of labor related news events seem to not elicit any market response as evident from the tall histogram at CSS sentiment score of 0. Again, observations with negative market reaction (20%) are smaller than observations that elicit a positive market reaction (53%).

To exploit the nuanced understanding of labor related issues afforded by the RPA database, we create a composite measure *NEG_LABOR_NEWS* that we use in our empirical tests. It takes the value of 1 if ESS is less than 0 and CSS is also less than 0 (entity and story wise sentiments are both negative), 0 otherwise. *NEG_LABOR_NEWS* proxies for the overall labor climate in which the firm is operating. A value of 1 indicates a negative climate and signals that the firm is facing potential labor related threats arising out of issues like strikes, layoffs, unsuccessful union negotiations etc.

Figure 3. Sample Distribution of Means of Event Sentiment Score (ESS) and Composite Sentiment Score (CSS)



Such threats can mould the disclosure choices made by firms in the direction predicted by existing studies. Table 4 provides the descriptive statistics of the labor threat measure from Raven Pack data. Slightly above 8% of the observations have overall negative sentiment, proxying for potential labor related threat³².

Table 4. Descriptive Statistics of Raven Pack News Sentiment Based Measures

	N	Mean	Std	Min	25%	Median	75%	Max
NEG_CSS	63131	0.20	0.40	0	0	0	0	1
NEG_ESS	63131	0.22	0.42	0	0	0	0	1
NEG_LABOR_NEWS	63131	0.08	0.28	0	0	0	0	1

To exploit the nuanced understanding of labor related issues afforded by the RPA database, we create a composite measure *NEG_LABOR_NEWS* that we use in our empirical tests. It takes the value of 1 if ESS is less than 0 and CSS is also less than 0 (entity and story wise sentiments are both negative), 0 otherwise. *NEG_LABOR_NEWS* proxies for the overall labor climate in which the firm is operating. A value of 1 indicates a negative climate and signals that the firm is facing potential labor related threats arising out of issues like strikes, layoffs, unsuccessful union negotiations etc.

We merge the Raven Pack Data with Compustat-Hoberg-IBES dataset (See Table 1 on Sample Construction) and run the following logistic specification-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot NEG_LABOR_NEWS_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot NEG_LABOR_NEWS_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

³² Our new measures of labor related threats (earnings calls and news based) have values that are closer to Hilary (2006) than Hamm et al. (2018). Hilary reports mean labor strength (*LSTR*) for her sample to be 11%. Hamm reports unionization rate of 20%. Strikes, Layoffs and Union related threats from earnings calls are all between 6%-9%, and news-based threat from RPA is slightly above 8%.

The output for logistic regression without and with controls is provided in Table 7, columns 1 and 2 respectively. The coefficient on *PMF* is -0.0804 and is significant at 1% level. One reason for low economic significance could be that a news article may refer to the firm obliquely among other things which does not impact the firm in a direct way. For instance, the supplier of a firm X might be the focus of a news article and firm X being a customer might find a mention too.

Table 7. Logistic Regression of Good News, Competition and Labor Threats (RPA)

VARIABLES	(1) LOGIT	(2) LOGIT
PMF	-0.0804*** (0.00959)	-0.0749*** (0.00991)
NEG_LABOR_NEWS	-0.333** (0.170)	-0.381** (0.176)
PMF*NEG_LABOR_NEWS	0.0564** (0.0238)	0.0628** (0.0249)
Constant	-2.416*** (0.597)	-6.103*** (0.627)
Observations	30,393	30,393
Industry FE	Yes	Yes
Year FE	Yes	Yes
Controls	No	Yes
Clustering	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) without controls and (column 2) with controls for specification-

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot NEG_LABOR_NEWS_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot NEG_LABOR_NEWS_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *LABOR_NEWS* is a binary variable that takes the value 1 if news sentiment is less than 0, 0 otherwise. The double interaction term *PMF*LABOR_NEWS* is the main variable of interest Both the columns include industry-year fixed effects at two digits SIC.

The results from sentiment of labor news as well as manager's own discussion in earning conference calls about the nature of labor related threats that the firm faces collectively supports the prediction of *AR24* that a firm facing threat from labor as well as competition is less likely to withhold good news and disclose good news in equilibrium³³.

Hamm et al. (2018) Measure of Unionization

As discussed earlier, Hamm et al. (2018) proposed a binary measure of whether a firm is unionized or not. Information about whether employees are unionized or not is given in the firm's annual 10-K filing with the SEC. Following the procedures in Hamm et al. (2018) the measure is constructed through a multistep search logic. First, we search for variations of phrases and key words like "union(s)", "unionization", union(ized), "collective(ly) bargain(ing)", "labo(u)r/employee(s)/worker(s)' organization(s) etc. We exclude those instances where "union" is followed by "bank" or preceded by "Soviet".

For all instances captured in the first step, *UNION_DUMMY* is coded as 1, rest is coded as 0. Second, we consider all the instances for which *UNION_DUMMY* is coded as 1 in previous step and search for "No union" expressions like "None of our labor force is covered by a collective bargaining agreement", "We have no unionized employees", "There is no collectively bargained agreement", "A union does not represent any of our" etc. For all such instances where "No union" phrases are found, *UNION_DUMMY* is coded back to 0. Finally, if any of the "No union" expressions from previous step are found with a specific geographic region in the same sentence like "None of our employees in India is unionized", "We have no unionized employees in Europe" etc., then we do not consider it to be "No union" expression

³³ As mentioned earlier in the article we code *PSURP=0* for firms that do not disclose. Appendix C provides results of a sub-sample in which we remove these non-disclosing firms to keep only those firms that provide guidance (that is only the IBES sample. Our results continue to hold

and code *UNION_DUMMY* back to 1.³⁴ A full set of keywords/phrases used is given in Appendix B.

Table 8. Logistic Regression of Competition, Good News and Unionization Dummy

VARIABLES	(1) LOGIT
PMF	-0.0489*** (0.00946)
UNION_DUMMY	-0.550*** (0.137)
PMF*UNION_DUMMY	0.0506** (0.0207)
Constant	-3.925*** (0.594)
Observations	76,488
Industry FE	Yes
Year FE	Yes
Controls	No
Clustering	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) for specification

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot UNION_DUMMY_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot UNION_DUMMY_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *UNION_DUMMY* is a binary variable that takes the value 1 if a firm is unionized in a year, 0 otherwise. The interaction term *PMF*UNION_DUMMY* is the main variable of interest Both the columns include industry-year fixed effects at two digits SIC.

We test our hypothesis again using a binary variable *UNION_DUMMY*, a firm-year measure of unionization instead of *IMMINENT* or *NEG_LABOR_NEWS* that we used in our main tests. If a firm is unionized in any given year, *UNION_DUMMY* takes the value 1 for that firm-year observation, 0 otherwise. Table 8 in the previous page presents the results from our logistic regression specification. The coefficient on *PMF* and *UNION_DUMMY* is negative and significant at 1% level, while the coefficient on the interaction term *PMF*UNION_DUMMY* is positive and significant at 5%.

³⁴ For this step, we use Python's Spacy library's GPE (Geographical region) tag for Named Entity Recognition. Documentation available in <https://spacy.io/usage/linguistic-features>.

Firm Fixed Effects Specification

We employ firm and year fixed effects in our logistic regression *IMMINENT* and *HI_RISK* measures. Table 9 presents output from the regression. Column 1 presents results for our *IMMINENT* measure of labor threat, while columns 2 and 3 present results from textbook and speech measures of labor threat respectively. As evident, our results largely hold even when we consider within firm specification.

Table 9. Logistic Regression with Firm Fixed Effects

VARIABLES	(1) ECC	(2) TEXTBOOK	(3) SPEECHES
PMF	-0.0493*** (0.0179)	-0.0531*** (0.0181)	-0.0524*** (0.0181)
IMMINENT	-1.643** (0.660)		
HI_RISK1		-0.574** (0.252)	
HI_RISK2			-0.330 (0.241)
PMF*IMMINENT	0.286*** (0.105)		
PMF*HI_RISK1		0.0855** (0.0349)	
PMF*HI_RISK2			0.0598* (0.0350)
Observations	12,676	12,671	12,671
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression (column 1) for specification

$$PSURP_{i,t} = \beta_0 + \beta_1 \cdot LABOR_THREAT_{i,t} + \beta_2 \cdot PMF_{i,t} + \beta_3 \cdot LABOR_THREAT_{i,t} \cdot PMF_{i,t} + \beta_4 \cdot Controls_{i,t} + \gamma_j + \theta_\tau + \epsilon_{i,t}$$

Dependent variable is *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. *PMF* is continuous variable that proxies for product market competition. *LABOR_THREAT* can be *IMMINENT*, *HI_RISK1* or *HI_RISK2*. These are binary variables that take the value 1 if a firm is unionized in a year, 0 otherwise. The interaction term *PMF*LABOR_THREAT* is the main variable of interest Both the columns include firm-year fixed effects.

Entropy Balanced Samples

In our main tests using *IMMINENT*, *HI_RISK1* and *HI_RISK2* as our proxies for labor related threats, we saw that a small amount of treatment observations is driving our results. This is not unexpected as only small number of firms face any labor related threats at any given point in time and even smaller are the instances when these threats become pressing in nature to figure in earnings conference calls.

Table 10. Logistic Regression of Competition, Good News (PSURP) and Labor Threats with Entropy Balanced Samples

VARIABLES	(1) ECC	(2) TEXTBOOK	(3) SPEECHES
PMF	-0.118*** (0.0270)	-0.0501*** (0.0121)	-0.0264* (0.0157)
IMMINENT	-1.048* (0.556)		
HI_RISK1		-0.567*** (0.185)	
HI_RISK2			-0.333 (0.239)
PMF*IMMINENT	0.151* (0.0845)		
PMF*HI_RISK1		0.0863*** (0.0237)	
PMF*HI_RISK2			0.0640** (0.0315)
Constant	-5.099*** (0.842)	-4.969*** (1.039)	-4.997*** (1.034)
Observations	30,392	30,392	30,392
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Clustering	Yes	Yes	Yes

Robust standard errors in parenthesis. The stars *, ** and *** represent significance at 1%, 5% and 10% respectively. This table presents results from logistic regression for the two measures of labor related threats using Entropy Balanced samples. Dependent variable *PSURP*, that takes the value 1 if management's capex forecasts exceed analyst's consensus forecast, 0 otherwise. The interaction terms in **bold** are the main variables of interest. All the columns include industry-year fixed effects at two digits SIC.

We re-run our main tests using entropy balanced samples. Entropy balancing seeks to re-weight control observations to match the moments of covariate distribution of the treatment group to obtain a more balanced sample. Table 10 provides results from entropy balanced sample. Column 1 provides results from balancing the ECC sample and Columns 2 and 3 provide results for textbook and speech. Our results continue hold across both the measures.

6. Conclusion

Arya and Ramanan (2024) challenge the prevalent understanding that when incentives are aligned, one directional economic force are additive. We empirically test their theory using a firm's capital expenditure forecasts as proxy for the firm presenting a long term favourable outlook (good news) and find support for their theory. We introduce two new measures of labor related threat using quarterly earnings conference calls and news articles that generalizes the labor related issues faced by a firm beyond organized labor unions. We find that their story holds through alternate measures of labor threats, alternate fixed effects specifications and entropy balanced samples. The theory of a firm's disclosures having direct and indirect effects on multiple recipients can be studied further in variety of settings involving two opponents for whom disclosure incentives are aligned like product market rivals, political costs, regulatory threat, labor unions etc.

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Appendix A. Variables Description

Variable	Description
<i>Main Variables</i>	
PSURP	Binary variable that takes the value of 1 if management forecast exceeds analysts' forecast, 0 otherwise
UNION_DUMMY	Binary variable that takes the value of 1 if firm is unionized based on text analytics of 10K, 0 otherwise
PMF	Product market fluidity proxying for competition
IMMINENT	Binary variable that takes value of 1 if managers discuss layoff, strike and union, 0 otherwise
LABOR_NEWS	Binary variable that takes the value of 1 if both ESS and CSS score is less than 0, 0 otherwise
NEWS	(Manager's Forecast-Analyst Forecast)/ Analyst Forecast
GOOD_NEWS	Binary variable that takes the value of 1 if NEWS \geq 0, 0 otherwise
<i>Control Variables</i>	
TOBINQ	$(ATQ+(CSHOQ*PRCCQ)-CEQQ)/(ATQ)$
IND_HHI	Herfindahl-Hirschmann Index measured at 2 digits industry level.
TANGIBLE	PPENTQ/ATQ
LEVERAGE	$(DLTTQ+DLCQ)/ATQ$
RETURN	Percentage change in stock price over previous quarter.
RETVOL	Rolling one quarter window standard deviation of stock return
CAPXVOL	Rolling one quarter window standard deviation of capex investments.
SIZE	Natural logarithm of market capitalization
BIG4	Binary variable that takes the value of 1 if firm is audited by a big 4 auditor
BADNEWS	Binary variable that takes the value of 1 if firm made a loss in the previous quarter

Appendix B. Complete list of union and non-union phrases and keywords.

<p>Union Phrases and Keywords</p>	<p>union(s), unionization, unionized, collectively bargain, collective bargaining, labo(u)r organization(s), employee(s)' organization(s), worker organization(s), collective agreement(s)</p>
<p>Non-Union Phrases and Keywords</p>	<p>none of our labor force is covered by a collective bargaining agreement, none of our employees is covered by a collective bargaining agreement, we have no unionized employees, there is no collectively bargained agreement, a union does not represent any of our, not party to any collective bargaining agreement, no current u.s.-based employees are unionized, we have no unionized employees in, none of our employees are unionized, union bank, ununionized, none of our employees in mexico are unionized, collective bargaining agreements do not represent, european union, soviet union, credit union, collectively bargained agreements do not represent, employees are not members of, labor force is not member of, non-unionized, non unionized.</p>

Appendix C. Logistic Regression of Good News, Competition and Labor Threat for Sub Sample of Firms from IBES That Provide Guidance.

VARIABLES	(1) PSURP	(2) TEXTBOOK	(3) SPEECHES
PMF	-0.0401*** (0.0111)	-0.0440*** (0.0114)	-0.0416*** (0.0114)
IMMINENT	-1.443** (0.690)		
HI_RISK1		-0.711** (0.281)	
HI_RISK2			-0.459* (0.274)
PMF*IMMINENT	0.230** (0.106)		
PMF*HI_RISK1		0.0998** (0.0394)	
PMF*HI_RISK2			0.0652 (0.0400)
Constant	-1.499*** (0.558)	-1.561*** (0.556)	-1.577*** (0.555)
Observations	6,702	6,702	6,702
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Clustering	Yes	Yes	Yes