

Competitive and Contagion Effects in Corporate Layoff Announcements

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Abstract

We find strong evidence of intra-industry information transmission to employee layoff announcements. Although the stock price response for the full sample of industry rivals is weakly positive and consistent with a net competitive effect, we find evidence that contagion and competitive effects could happen simultaneously. Results consistent with the contagion effect are observed for low-leverage rivals that have high a Tobin's q and belong to industries where the layoff announcement contained adverse information regarding the industry. Results consistent with the competitive effect are observed for rivals that are large, efficient and belong to industries of firms whose layoff announcement did not contain any adverse information regarding the industry or when a dominant firm in the industry announces layoffs. Overall, portfolio and cross-sectional analyses provide results that are generally consistent with a net competitive effect.

Keywords: Layoffs, Competition, Contagion

1. Introduction

"Other high-tech companies stand to gain from Apple layoffs," (*January 16, 1998, CNN Financial*).

"Dutch financial powerhouse ING Group N.V. plans to cut 1,200 jobs Reflecting the dismal conditions, shares of brokerage firms again felt the heat," (*October 1, 1998, CNN Financial*).

News items such as these suggest that announcements of employee layoffs have potential to affect the share prices of other firms in the industry. While the effect of such announcements on the stock prices of firms undertaking layoffs have been analyzed in the past (Worrell, Davidson and Sharma (1991) and Palmon, Sun and Tang (1997)), the associated industry effects have not received

any attention.¹ Extant empirical evidence suggests that many corporate events have the potential to reverberate, positively or negatively, across the industry of the firm being directly affected by the event itself. Intra-industry information transmission around corporate events, such as earnings announcements and bankruptcies, suggests that firm-specific events may be rich in information regarding the financial health of competitors.² Anecdotal evidence from the popular media (as the examples above show) clearly suggest that employee layoffs belong to the class of corporate events that are potentially rich in information regarding the future health not only of the firm that announces layoffs but also that of rivals within the industry. However, there has been no systematic effort in the finance literature to examine the industry-wide impact of employee layoffs. Given the lack of any documented evidence on the industry effects of layoff announcements, this study is more in the nature of exploring any ripple effects and their determinants. We therefore seek answers to three questions: (i) Do layoff announcements contain information that has the potential to affect other firms within the industry? (ii) If there is such information, what is the direction and magnitude of the reaction of rivals in response to this information? (iii) What are the determinants of the rival firm's reaction?

The rival firm's stock prices can change in either direction depending upon the underlying reasons for the layoff. Lin and Rozeff (1993) and Palmon, Sun and Tang (1997) identify two possible motivations contained in management's stated reasons for layoffs. Under one scenario, firms will layoff employees in response to efficiency gains or planned efficiency gains, and such announcements are expected to affect the announcing firm's stock price positively. This gain will reflect both the present value of expected savings through reduced fixed costs and an information effect driven by the potential for increased market share through increased sales and profitability resulting from the efficiency gains. Alternatively, the positive stock price reaction could also be indicative of management's commitment to stemming the losses. A second scenario as identified by the above studies that prompts firms to downsize is the deterioration in general market conditions. Such announcements are expected to be accompanied by a negative stock price response for the announcing firm. Thus, the response for the rivals could be either positive or negative, if there is an intra-industry announcement effect. Layoffs that signal a decrease in demand attributable to poor market conditions or an increase in input prices are expected to draw an adverse reaction across the industry (contagion effect). The motivation for managers to be candid about the reasons for downsizing, as in the previous two situations, is not difficult to comprehend given that in either case managers are perceived as 'doing the right thing' taking into account the changed firm or industry circumstances. It is equally easy to imagine situations where firms layoff employees primarily due to internal reasons such as managerial inefficiency in identifying profitable projects. In sharp contrast to the previous two motivations, management is not likely to announce the *exact* reason for the layoff when poor managerial performance is the primary contributing factor. Poorly performing firms could experience shrinking market share even when the industry itself is expanding. Such a scenario would suggest a potential for rivals to profit at the expense of the announcing firm (competitive effect).

Our findings show that stock prices of firms announcing layoffs experience a significant downward revision in prices (-0.87 percent, t-statistic = -2.22) over the three days (-1,1) relative to the day of the layoff announcement. Our primary interest, however, is centered on the response of rivals.

¹ Worrell, Davidson and Sharma (1991) document a negative stock price effect for the entire sample of firms with the reaction being more negative for firms that attributed retrenchment to financial reasons. In a more recent study Palmon, Sun and Tang (1997) show that stock price reaction can differ based on the announced reason for the layoff. Stock prices of firms appreciate when managers announce cost reduction as the primary reason for the layoff and drop when the reason for layoff is poor market condition.

² Previous researcher examining stock price effects on competitors around corporate events include: announcements of earnings (Foster (1981)), Han and Wild (1990)) and Han, et al (1989)), security offerings (Slovin, et al (1992)), Szewczyk (1992)), stock repurchases (Hertzel (1991)), corporate bankruptcies (Lang and Stulz (1992)), going private transactions (Slovin (1991)), bank failures (Aharony and Swary (1996)) and corporate bond rating changes (Akhigbe and Madura (1996)).

In answer to the first of our three questions, our results suggest that layoff announcements do have the potential to affect other firms in the industry. A marginally positive stock price response (0.09 percent, z -statistic = 1.61) for the complete sample of rivals over the traditional three-day window is consistent, albeit weakly, with a net competitive effect. A weak or no response for the rivals around the announcement of a corporate event could either suggest that the information contained in the announcement is of marginal value, at best, as far as the overall impact on the industry is concerned, or both the competitive and contagion effects are happening simultaneously for different sub-samples and the effect washes out when combined. Analysis of sub-groups of our sample suggests that both the competitive and the contagion effects could be simultaneously operating. Specifically, the response of the rivals is consistent with a competitive effect when a dominant firm announces a layoff or when the stated reason for the layoff does not indicate adverse industry-wide conditions. In addition, this competitive effect is significantly greater for rivals that are larger and efficient. We also find evidence consistent with a contagion effect when the stated reason for the layoff suggests worsening industry-wide conditions. This contagion effect, in turn is stronger for low-leverage rivals that have a greater proportion of their value accounted for by growth opportunities.

The remainder of the paper is organized as follows. Section 2 contains the development of the competitive and contagion effect hypotheses. Data and methodological issues are discussed in section 3. Section 4 presents the results and discusses the empirical findings and section 5 concludes the paper.

2. Development of Hypotheses

Announcement of employee layoffs will affect stock prices of competitors if the reason for retrenchment, as inferred by investors, warrants revaluation of rivals. This revaluation may result in either an increase or a decrease in the stock prices of the rivals depending on the underlying reasons for the layoffs. When the market's response to rivals' stock price is opposite to that of the announcing firm we call this the *competitive effect*. On the other hand, when the rivals' stock price responds in the same direction as the announcing firm, we refer to this as the *contagion effect*. We develop the competitive and contagion effect hypotheses in more detail below.

2.1. Competitive Effect Hypothesis

Layoff announcements can affect rivals within the industry when market participants' perception regarding their competitive position gets altered. Companies can choose to trim down for a number of reasons, such as improved efficiency or deteriorating market or internal conditions. Reasons for layoffs, such as improved efficiency, can enhance the competitive position of the firm within the industry and hence be detrimental to competitors. On the other hand, reasons that indicate deteriorating internal conditions for the firm can potentially have a beneficial effect on the rivals. Depending upon the reasons for layoffs, the competitive position of rivals can either get enhanced or deteriorate. Specifically, retrenchment prompted by increased efficiency or planned efficiency gains can improve the competitive position of the firm announcing the layoff. This can result in an increase in the firm's market share and higher profitability from improvements in product or service quality. Therefore, announcements that render the competitive position of rivals at a disadvantage will lead to a downward revision in their stock prices. Such a reaction would be more pronounced in firms that are ill prepared to face the increased competition. On the contrary, downsizing in response to deteriorating internal conditions can potentially render the competitive position of the rivals stronger in the expectation of increased market share.³

The ability of competitors to take advantage of the poor operating conditions of the announcing firm or the risk of being adversely affected if the announcing firm is downsizing to become more lean and productive will depend on the stature of the announcing firm in the industry. Firms that are small players in the industry are less likely to have a significant impact on the competitors compared to firms

³ See, for e.g., Bolton and Scharfstein (1990)

that are dominant players. The potential gains (or losses) to the rivals will, thus, likely depend on the competitive position of the announcing firm in the industry. Thus, the competitive effect, where it exists, is expected to be stronger if the firm announcing the layoff is a dominant firm in the industry.⁴

2.2 Contagion Effect Hypothesis

Another reason that can prompt firms to layoff employees is a general worsening of market conditions. Song and Walkling (1997) identify a number of reasons such as changes in technology, changes in the industry's cost structure, regulatory changes and changes in consumer tastes, which can lead to the deterioration in the prospects in specific sectors in the economy. Adverse market conditions will potentially affect all firms in the industry negatively. We, thus, expect the average stock price reaction of rivals to be negative when the announcing firm is downsizing due to a decline in the overall outlook for the industry.

However, not all firms within the industry will be equally affected by poor market conditions. Rivals whose market capitalization is substantially determined by future growth options are expected to have a stronger adverse impact, holding other things constant. In addition, for reasons similar to those stated in section 2.1, the response of the rivals is expected to be affected by the stature of the announcing firm in the industry.

While most prior studies on industry effects of corporate announcements study the overall effect on rivals, we take the analysis a step further and examine the cross-sectional variation in competitor response. Specifically, for the sample of announcements that are likely to result in a contagion effect we examine their announcement period reactions separate from the sub-sample that experiences a competitive reaction. Such a segregation is warranted given the differing nature of forces that would dictate rival reaction under the two diametrically opposite effects.

3. Data and Methodology

The sample of firms announcing employee layoffs was obtained from the *Dow Jones News Retrieval Service (DJNRS)* by issuing search key words such as “layoff”, “retrenchment” and “downsizing”. The only requirement was that the event should have a clearly identifiable announcement date. Since the primary aim of this study is to analyze the stock price effects of layoff announcements on rivals, no other restrictions are imposed on the data. The final sample consists of 403 announcements.⁵ Panel A of Table 1 shows that layoff announcements are evenly distributed over the 1984-1994 sample period with the exception of 1990. Panel B shows that a majority of the sample (51.86 percent) is composed of announcements from the Machinery and Manufacturing industries. Since the cost of labor (variable cost) of asset intensive (high operating leverage) companies is significantly less than their fixed costs, profits of such companies are expected to be more sensitive to changes in sales suggesting a potential for competitive reaction among rivals. The stock price reaction of such firms will, therefore, increase when problems in a large competitor suggest a potential for increased sales, and decrease when problems in a competitor signal adverse conditions for the entire industry. Other major industry groups represented in the sample are Food and Chemicals (10.42 percent), Transportation (9.93 percent), and Finance and Real estate (10.92 percent).

⁴ Lang and Stulz (1992) suggest the possibility of competitive effect upon chapter 11 announcements in more concentrated industries i.e. industries with greater sales based herfindahl index. However, we do not observe any competitive effect for sub-samples with greater industry concentration and hence do not pursue this line of argument.

⁵ Worrell, Davidson and Sharma (1991) initially identified 441 layoff announcements over the period 1979-1987.

Table 1: Frequency distribution of layoff announcements

Frequency distribution of firms announcing employee layoffs between 1984 and 1994 are provided. The announcements were obtained from the Dow Jones News Retrieval Service (DJNRS).

Pabel A: Distribution by year

Year	Frequency	Percentage	Cumulative %
1984	36	8.93	8.93
1985	47	11.66	20.60
1986	34	8.44	29.03
1987	25	6.20	35.24
1988	36	8.93	44.17
1989	33	8.19	52.36
1990	7	1.74	54.09
1991	36	8.93	63.03
1992	53	13.15	76.18
1993	58	14.39	90.57
1994	38	9.43	100.00
Total	403	100	

Panel B: Distribution by industry

Industry	SIC codes	Frequency	Percentage	Cumulative %
Oil, Coal, Metal Mining	1000-2000	23	5.71	5.71
Food, Chemicals	2000-3000	42	10.42	16.13
Machinery, Manufacturing	3000-4000	209	51.86	67.99
Transportation	4000-5000	40	9.93	77.92
Wholesale trade	5000-6000	17	4.22	82.13
Finance, Real estate	6000-7000	44	10.92	93.05
Hotels, Entertainment	7000-8000	23	5.71	98.76
Services	8000-9000	5	1.24	100
Total		403	100	

Table 2 contains summary financial statistics of the layoff-firms and their industry rivals. The mean (median) asset size of the layoff-firms of \$21.084 billion (\$3.729 billion) is significantly greater than the mean (median) asset size of \$4.143 billion (\$1.053 billion) of its rivals and the difference is significant at less than the 1 percent level. The average layoff-firm is, thus, significantly large with presumably a large market share. Any indication of a scale back in its market share, as revealed through the layoff announcement, would potentially be beneficial to the rivals. This is amply supported by the significantly larger average (median) sales of \$14.71 billion (\$3.714 billion) for the layoff-firms compared to \$3.014 billion (\$894 million) for the rivals. Similar conclusions with respect to the potential for increased market share for rivals can be drawn by the significantly greater mean (median) Tobin's q of 1.547 (1.347) of the rivals compared to the Tobin's q of 1.412 (1.175) for the layoff-firms. Also, the mean (median) growth rate in sales of 0.151 (0.104) of rivals is significantly greater than 0.104 (0.058) of the layoff-firms. The aggregate picture that emerges from a comparison of the financial statistics of these two groups of firms suggests internal rather than industry-wide problems for the sample analyzed. Given such a scenario and the observation that a majority of layoffs happen in asset-intensive companies with large market shares, we predict a net competitive effect for the rivals.

Table 2: Summary financial statistics of firms announcing layoffs and Rivals

Summary financial statistics for the firms announcing employee layoffs and their industry rivals. Rivals are defined as firms in the same 4-digit SIC code as the firm announcing layoff. Variables for rival portfolios are computed as the average for all firms in the industry except the firm announcing the layoff. All financial data was obtained from the Standard & Poor's COMPUSTAT database. Significance levels for the difference of means are based on the t-test and those for the difference in medians are based on the Wilcoxon signed-rank test.

Variable	<u>Layoff firms</u>		<u>Rivals</u>		<u>Difference (p-value)</u>	
	mean	median	mean	median	mean	median
Total assets (millions)	21084	3729	4143	1053	0.001	0.001
Return on equity	4.272	5.114	4.342	4.382	0.845	0.281
Tobin's q	1.412	1.175	1.547	1.347	0.009	0.001
Leverage	0.165	0.148	0.175	0.146	0.248	0.078
Sales (millions)	14709	3714	3014	894	0.001	0.001
Growth rate in ROE	-0.219	-0.068	0.113	-0.071	0.171	0.077
Growth rate in sales	0.104	0.058	0.151	0.104	0.007	0.001
Prior CAR	-0.035	-0.048	0.014	0.026	0.269	0.124

Total assets compustat data item 6

Return on equity compustat data item 18 divided by item 6

Tobin's q computed as in Chung & Pruitt (1994)

Leverage long-term debt over total assets: data item 9 divided by data item 6.

Sales compustat data item 12.

Growth rate in ROE growth rate in return on equity over the 3 years preceding the layoff announcement

Growth rate in sales growth rate in sales over the three years prior to the layoff announcement

Prior CAR cumulative abnormal returns over the period (-300 to -50) days relative to the date of the layoff announcement

All variables are computed at the end of the fiscal year immediately preceding the year of the layoff announcement.

Announcement period cumulative abnormal returns are computed using the event study methodology as described in Patell (1976). Market model parameters are estimated using an estimation window from day -75 to day -16 where day 0 is the layoff announcement day.

4. Results and Discussion

4.1 Stock Price Reaction at the Announcement

Table 3 contains the stock price reactions for the complete sample of layoff-firms and their rivals. Stock prices of firms announcing employee layoffs experience a significantly negative reaction at the announcement of downsizing. The reaction over the traditional three-day window (-1, 1) relative to the date of the announcement is -0.87 percent with an associated t-statistic of -2.22.⁶ While layoffs motivated by efficiency enhancement should expectedly evoke a positive response, retrenchments due to adverse firm or industry conditions should result in a downward revision in stock prices. A net negative response for the full sample of announcing firms suggests that stock prices are punished significantly more under the latter scenario than they are rewarded under the former. The overall net negative effect is consistent with the empirical evidence reported in Worrell, Davidson and Sharma (1991).

Rivals, on the contrary, react quite differently. The average reaction of all the firms within the same four-digit SIC code as the layoff-firm is a positive 0.09 percent but only marginally significant at

⁶ Palmon, Sun and Tang (1997) report announcement period stock price reaction of -1.82 percent for firms that attribute layoffs to declining demand and 0.60% for the efficiency enhancing sub-sample. Worrell, Davidson and Sharma (1991) document a three-day stock price reaction of -0.47 percent.

the 10% level, a result weakly consistent with the competitive effect hypothesis. As noted previously, a weak or no response from the rivals could suggest either that the layoff announcement contains localized information pertinent just to the affected firm and is of marginal information value or that both the competitive and contagion effects coexist in sub-samples of the data and negate each other out. The size and significance of the stock price response for the complete sample of rivals surrounding corporate layoff announcements suggests that either one of these reasons may be driving the result. We analyze the data further to identify which one of these reasons leads to a marginal response for the overall sample.

While Palmon, Sun and Tang (1997) study sub-samples based on explicitly announced reasons, we conjecture that, management is more likely to explicitly announce the exact reasons for layoffs only under situations that do not reflect poorly upon them.⁷ For example, if persisting losses are the primary reason for cutting back on labor, management is more likely to announce it as a reason when peers within the industry are also experiencing similar conditions. On the other hand, they will likely choose to put a different spin on it when internal inefficiencies are the primary reason for the losses. Since the stated reason for the layoff announcement may differ from the actual underlying motivation, we examine the performance of the layoff firms and rivals over the one year period leading up to the layoff announcement. The results show strikingly different trends for the announcing firm and its rivals.⁸ Even though the cumulative abnormal return for the layoff-firm is positive (though not significant) it chooses to announce loss as a reason for the layoff when the general industry-wide trend is negative. This evidence suggests that if loss is stated as the reason for the retrenchment it is indicative of the deterioration in the prospects for the entire industry. On the other hand, when the layoff announcement is not accompanied with loss as a reason, the cumulative abnormal returns for the rivals are significantly positive while they are negative for the announcing firm. It, thus, appears that even though loss may be a predominant reason for the layoff, the firm chooses not to explicitly state it as such since it is due to firm specific factors and not driven by the prospects of the whole industry. We, therefore, have to be cautious when basing our inferences on the stated reasons for the layoffs. Based on the evidence presented in footnote 8, we use the explicitly stated reason of a loss by the announcing firm as indicative of poor industry prospects. Hence, a contagion effect is expected when loss is explicitly stated in the announcement. On the contrary, when loss is not announced as a reason, the layoff announcement is more likely to be due to firm specific factors rather than industry wide poor conditions. As a result, the market reaction for the rivals is expected to be driven by a competitive effect.

We split the sample into cases where loss is announced as the primary reason for retrenchment ($n=38$) and cases where no such explicit statement is made regarding the financial health of the firm ($n=308$). We find that the stock price reaction is negative for both the sub-samples, though it is significantly more negative when loss is the announced reason. Most firms in our sample appear to layoff employees for reasons unrelated to prevailing conditions in the industry.

However, we are primarily concerned with the effect that layoff announcements will have on the stock prices of rivals. Consistent with the contagion effect hypothesis, rival stock prices experience a strongly negative reaction (-0.42% , t -statistic $=-2.73$) when loss is the announced reason. This result is in sharp contrast to the net competitive effect documented for the full sample. Clearly, the evidence in this study suggests that the industry-wide response to specific corporate events have to be investigated keeping in mind the underlying motivations for these events.

⁷ Moreover, there is reason to believe that inferences drawn by the market may not necessarily agree with the stated reasons for the layoffs. Anecdotal evidence suggests that stock price reaction at layoff announcement is not necessarily consistent with management's stated reason for the layoff. For example, Crown, Cork and Seal announced a 7 percent cut in its work force stating cost-cutting as the primary objective. The stock price of Crown dropped 13 percent in response to the news (Dow Jones News Wire, September 22, 1998).

⁸ The cumulative abnormal returns for the rivals over the period -300 to -50 days prior to the announcement of the layoff when loss is announced as a reason is -11.27% (t -statistic $=-4.04$) and equals 4.69% (t -statistic $=4.16$) when loss is not announced as a reason for the layoffs. Performance of layoff firms over the same period is 12.28% (t -statistics $=0.87$) when loss is announced as a reason and -5.33% (t -statistic $=-1.50$) when loss is not the announced reason.

The strong negative reaction of the layoff firms when loss is the announced reason seems to contain adverse information for the entire industry leading to an industry wide downward revision in stock prices around the announcement date. On the contrary, when the layoffs seem to be in response to weakening internal conditions the rivals experience an upward revision in stock prices. Consistent with the competitive effect hypothesis, rival reaction is significantly positive (0.17%, t -statistic=2.86) when loss is not announced as a reason for the layoffs. This result further confirms that the market draws inferences regarding management's motives and does not necessarily rely on the announced reasons i.e. managers only choose to make an explicit mention of losses when it is an industry wide phenomenon.

We next examine rival stock price reaction to layoff announcements by large dominant players in the industry. Similar to Akhigbe and Madura (1996) a dominant firm is defined as one that has assets more than the average of the assets of all firms in the same four-digit SIC code. Problems in a dominant firm in the industry can augur well for others especially when such announcements are not accompanied by adverse information regarding the industry i.e. there is no concomitant announcement of loss by the dominant firm. Consistent with the competitive effect hypothesis, rivals corresponding to layoffs in a dominant firm in the industry experience a strong positive reaction (0.18%, t -statistic=2.44). This positive reaction however is not uniform across all rivals. In unreported results, we further sub-divide the sample where the dominant firms also announce loss as the reason for the layoff versus dominant firms that do not make an explicit mention of loss. The results are interesting; rival stock price reaction is negative but insignificantly different from zero (-0.09%, t -statistic=-0.43) when the dominant firm announces persisting losses as a motivation for the layoffs suggesting that the positive competitive effect due to the potential of gaining additional market share is more than wiped out by the negative contagion effect reflecting dismal industry conditions. On the contrary, layoff announcements by dominant firms that are not accompanied with any other adverse information experience a strongly positive stock price appreciation (0.2%, t -statistic=2.62).

Finally, we examine the reaction of rivals when the layoff announcement is not by a dominant firm. Since the layoff firm is not a major player there is not much in it for the others, especially for larger rivals which have the wherewithal to exploit such opportunities. The reaction for this sub-sample is -0.03% but insignificantly different from zero. However, when this group of announcements was further divided based on loss as a reason we get the familiar result: in unreported results we find that layoff announcements by smaller firms accompanied with loss as a reason draw a strongly negative response from the rivals (-0.6%, t -statistic=-2.88) while the complementary sub-sample experiences a positive but insignificant reaction (0.13%, t -statistic=1.28). Recall, that the reaction of rivals when a dominant firm mentions persisting losses as a reason for the layoffs is insignificantly different from zero. Taken together, these results suggest that significant profit potential is created when a dominant firm downsizes. Overall, our results for the case when a dominant firm announces a layoff are strongly consistent with the competitive effect hypothesis.

4.2. Cross-Sectional Analysis

In this section we examine the association between the stock price reaction of rivals at the announcement of the layoff and firm specific variables. In keeping with our primary objective, we limit the cross-section analyses to the rivals only. We have hitherto established, based on the stock market reaction around the announcement (Table 3) that rivals react differently under contagion and competitive conditions. Therefore, we conduct the cross-sectional analysis separately for the sub-samples of rivals that are likely to experience either of the two effects. Based on our hypotheses developed in section 2, the following firm specific variables are of interest:

Table 3: Stock price reactions of layoff firms and rivals at the announcement

Stock prices reactions to announcements of employee layoffs are depicted both, for the firms that announce layoffs as well as for industry rivals within the same 4-digit SIC code as the firms announcing the layoff. From a total of 403 firms that announced a layoff over the period 1979-1995, 347 layoff firms and 14605 industry rivals had returns data on the CRSP (Center for Research on Security Prices) database. Cumulative abnormal returns were computed over the standard event window (-1,1) using the methodology described in Patell (1976). N-layoffs is the number of layoff firms in the sample and N-rivals is the number of rivals. *, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

Sample	<u>Layoff firms</u>			<u>Rival firms</u>		
	Mean (%)	t-statistic	t-statistic of difference	Mean (%)	t-statistic	t-statistic of difference
Full sample (N-layoffs=347, N-rivals= 14605)	-0.87	-2.22**		0.09	1.61	
Layoff firm announces loss as a reason for the layoffs (N-layoffs=38, N-rivals= 2037)	-2.29	-2.04**		-0.42	-2.73***	
Layoff firm does not announce loss as a reason for the layoffs (N-layoffs=309, N-rivals= 12568)	-0.7	-1.66*	1.26	0.17	2.86***	3.63***
Layoff firm is a dominant firm in its industry (N-layoffs=221, N-rivals= 8440)	-0.44	-1.24		0.18	2.44***	
Layoff firm is not a dominant firm in its industry (N-layoffs=126, N-rivals= 6165)	-1.64	-1.84*	-1.47	-0.03	-0.34	-1.83*

Size

Fama and French (1992) demonstrate that performance is inversely related to firm size. Larger firms are mired in operational inefficiencies that could be the result of a number of factors such as lack of focus or a lesser degree of transparency of managerial actions and hence have elevated levels of agency conflicts. In the event of adverse information (e.g., when the layoff firm explicitly announces loss as the primary driver of the downsizing decision) such firms are likely to suffer more than their efficient counterparts. On the other hand, the association between size and stock price reaction at the announcement could be quite different when there is a potential for the rivals to benefit (e.g., when a dominant firm downsizes). Short and Keasey (1999) report that larger firms have the potential to access funds with greater ease both internally and externally relative to smaller companies and thus would be in a better position to capture any market share potentially given up by the affected firm. They also argue that the presence of economies of scale allows larger firms to create barriers to entry (also, see Grinblatt and Titman (2002) page 167). Size is defined as the natural logarithm of total assets.

Growth

We also examine the association between available growth opportunities (proxied by Tobin's q) and stock price reaction. Since much of the stock price of high-q firms reflects future growth potential, adverse industry conditions under contagion should result in an inverse relation between Tobin's q and announcement period abnormal returns (see for e.g., Miles and Rosenfeld (1983)). On the contrary, under competitive conditions fast growth can become an important attribute especially when high Tobin's q is an indicator of management quality. Growth is proxied by Tobin's q computed as described in Chung and Pruitt (1994).

Leverage

Myers (1977) contends that the presence of debt in the capital structure can preclude a firm from investing in profitable projects. High leverage would be particularly harmful when layoffs suggest industry wide poor conditions that can prevent a firm from profiting under competitive conditions. Moreover, Jensen (1986) suggests elevated levels of agency conflict in firms that maintain low leverage with managers unwilling to commit free cash flow. Low leverage can also suggest managerial inefficiency in servicing higher levels of debt. Such firms would therefore be expected to experience a greater stock price decline under contagion conditions. Leverage is defined as the ratio of long-term debt to total assets.

Efficiency

Efficient firms are likely to weather any industry-wide adverse conditions better than their inefficient counterparts. Under contagion conditions this would imply that better performing rivals would not suffer as severely as others and under competitive conditions efficient rivals would be in a better position to capture any market share given up by the firm announcing layoffs. We proxy efficiency as the cumulative abnormal return over the period -300 days to -50 days relative to the layoff announcement (see, for e.g., Mandelker (1974) and Palepu (1986)).

Table 4 contains the results for the cross-sectional association between rival stock price reaction and firm characteristics. We have hitherto established based on our results in Table 3 that rivals react differently under contagion and competitive conditions. Therefore, it is appropriate that we conduct the cross-sectional analysis separately for sub-samples of rivals likely to experience either of the two effects.

Table 4: Cross-section regressions of rival stock price reaction on firm characteristics
Regressions of cumulative abnormal returns of industry rivals on firm characteristics are reported. Estimations are reported separately for subsets of the data likely to capture contagion and competitive effects. Cumulative abnormal returns are computed over the standard event window (-1,1) using the methodology described in Patell (1976). Loss dummy equals 1 when the layoff-firm announces loss as a reason for the layoff and zero otherwise and Dominant dummy equals 1 when the layoff-firm is larger than the average firm in its industry. *, ** and *** represent significance at the 10%, 5% and 1% levels respectively.

Panel A: Regressions for sub-samples when layoffs prompted by industry

	intercept	size	Tobin's q	leverage	prior CAR	Tobin's q*leverage	N	F-statistic
Model 1	-0.60*	0.06	-0.17**	0.26	0.04		1128	1.83
Model 2	-0.53	0.06	-0.22**	-1.7	0.05	1.36**	1128	2.17**

Panel B: Regressions for sub-samples when layoffs are primarily due to firm-specific reasons

	intercept	size	Tobin's q	leverage	prior CAR	size* prior CAR	size* leverage	N	F-statistic
Model 3	-0.48***	0.08***	-0.05	-0.29	-0.06			7465	8.09***
Model 4	-0.46***	0.08***	-0.06*	-0.3	-0.19**	0.03*		7465	7.31***
Model 5	-0.60***	0.10***	-0.05	0.74	-0.06		-0.17	7465	6.92***

Panel C: Regressions for sub-samples when a dominant firm announces layoff

	intercept	size	Tobin's q	leverage	prior CAR	size* prior CAR	size* leverage	N	F-statistic
Model 6	-0.49***	0.07***	-0.13	-0.12	-0.11**			5431	5.57***
Model 7	-0.46***	0.07***	-0.04	-0.14	-0.41***	0.07***		5431	7.28***
Model 8	-0.57***	0.08***	-0.04	0.47	-0.11**		-0.1	5431	4.58***

size = natural logarithm of total assets (compustat data item 6)
 Tobin's q = computed as in Chung & Pruitt (1994)
 leverage = long-term debt over total assets (data item 9 divided by data item 6)
 prior CAR = cumulative abnormal returns over (-300, -50) days relative to the date of the layoff announcement

4.2.1. Results under Contagion Conditions

Results under the contagion effect are contained in Panel A of Table 4. We find a strong inverse relationship between the stock price response of rivals and their available growth opportunities i.e., rivals react more negatively when a greater proportion of their value is accounted for by growth opportunities. Layoffs that suggest industry-wide dismal conditions affect growth firms significantly more than others given the greater likelihood that their potential growth may not materialize (see for e.g., Miles and Rosenfeld (1983)). Notwithstanding the effect of Tobin's q on rival stock price reaction there is reason to suspect that this association may not be linear.⁹ Myers (1977) suggests that the mere existence of growth opportunity does not guarantee its exploitation; value of such real options is contingent on future discretionary expenditure and debt can severely constrain a firm's ability to make such investments. To test this possibility, we include an interaction term (Tobin's q*leverage) in the previous model. Results in Model 2 show that this term is positive and statistically significant suggesting that the effect of growth opportunities on rival stock price reaction is a decreasing function of firm leverage. Growth opportunities of high-q (firms with Tobin's q > 1) and high-leverage firms had already been discounted by the market and hence are not as severely affected at the announcement of adverse information regarding the industry compared to the more credible growth opportunities of high-q and low-leverage firms. Moreover, the the model now becomes significant with the inclusion of the interaction term (F-statistic=2.17 and significant at less than 5% level of significance). Firm size and our proxy for efficiency (prior performance) although not statistically significant enter with a positive sign suggesting that larger and more efficient firms at least do not lose as severely during a general downturn. Overall, the results in panel A suggest that industry-wide adverse information affects growth firms with low leverage significantly more than others presumably reflecting a decreased probability of such growth options coming to fruition.

4.2.2 Results under Competitive Conditions

Panel B of Table 4 contains results for competitive conditions that would prevail when the layoff announcement did not contain any information suggesting that the problems within the layoff firm are more widespread. As we had seen in Table 3, rivals experience a significantly positive stock price reaction upon such announcements. However, there is no reason to expect a uniformly positive reaction among the portfolio of rivals. Model 3 shows that rival stock price reaction under competitive conditions is positively associated with the size of the rival. Larger firms would be better placed strategically to capture any lost ground from the layoff firms (Grinblatt and Titman (2002), page 167). Also, Short and Keasey (1999) suggest that larger firms would have better access to both internal and outside financing. On the other hand, larger firms are more prone to operational inefficiencies (potentially the result of factors such as lack of focus or a lesser degree of transparency of managerial actions) and hence have elevated levels of agency conflicts. Therefore, we expect cross-sectional variation in this association between rival firm stock price reaction and firm size within the set of large rivals. We estimate the previous model by including an interaction term size*prior performance (Model 4) and find the coefficient to be positive and significant at the 10% level. This result suggests that, holding size constant, rival stock price reaction is an increasing function of efficiency i.e. market expects larger rivals that are relatively more efficient to be better capable of exploiting such opportunities. Furthermore, consistent with Short and Keasey (1999), this finding is strengthened when inclusion of an interaction term involving size and leverage (Model 5) is insignificant suggesting that higher leverage does not seem to be a hindrance for larger rivals.

⁹ A quick check revealed that the stock price reaction over the three-day announcement window for high-q and high-leverage firms is -0.288% (t-statistic=-1.45) while that of firms with high-q and low leverage is -0.80% (t-statistic= -2.29).

Panel C in table 4 contains the results under competitive conditions created when a dominant firm in the industry announces layoffs. Once again, rival reaction has a strong positive association with firm size as in the previous case. However, contrary to intuition, results in this set of regressions (Models 6,7 & 8) suggest that firms with poor past performance (inefficient firms) are more likely to benefit from the layoffs. This result is somewhat tempered when an interaction term (size*prior performance) included in Model 8 has a strongly positive coefficient suggesting that the sensitivity of size is an increasing function of firm performance; larger, more efficient rival firms are expected to be more likely to gain from the layoffs. Conversely, the association between prior performance and the stock price reaction becomes increasingly weaker with firm size. Once again, size seems to be the single most important determinant of competitive strength and the ability of firms to act upon opportunities created by problems in a large competitor. Moreover, inclusion of an interaction term size*leverage is insignificant suggesting that market participants expect such firms, and especially the more efficient ones, to possess the ability to acquire any necessary funds and reserve borrowing power is not necessarily the sole determinant of financial flexibility.

5. Conclusion

Stock price effects of employee layoff announcements are analyzed primarily to examine any ripple effects across the industry. Specifically, we examine if layoff announcements contain information with potential to affect other firms within the industry, the nature and magnitude of the reaction of the rivals and finally the firm-specific determinants of rival firm stock price reaction. For the firms that undertake employee layoffs, we find that stock prices experience a significant downward revision in prices (-0.87 percent, t-statistic = -2.22) over the three days (-1,1) relative to the day of the layoff announcement. This finding is generally consistent with previous literature.

Stock price reaction of rivals, central to the primary objective of this study, is however, significantly positive (0.09 percent, z-statistic = 1.61) over the traditional three-day window. While the stock price effect for the rivals is consistent with the competitive effect, analyses of sub-samples suggest that both, the competitive and the contagion effects are simultaneously operative. Specifically, results consistent with a contagion effect are obtained when the stated reason for the layoff suggests potential industry-wide worsening of conditions. Low-leverage rivals with a greater proportion of their value accounted for by growth opportunities are affected significantly more during periods of downturn that affect all firms within the industry. Results consistent with the competitive effect hypothesis are obtained for rivals when a dominant firm announces a layoff or when the stated reason for the layoff does not indicate adverse industry-wide conditions. As suggested in Short and Keasey (1999) and Grinblatt and Titman (2002), such a competitive effect is primarily due to gains captured by more efficient larger rivals. Overall, our findings for the stock price response of industry rivals to employee layoff announcements are generally consistent with a net competitive effect.

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