Do worker layoffs influence corporate investment? New global evidence

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Abstract

Using a new data set on corporate investment and worker layoffs, we document that layoffs influence corporate investment. More importantly, we find evidence that the relation between layoffs and corporate investment is not uniform; the relation is stronger for U.S., U.K., and French firms, firms in particular sectors, and firms that possess certain stock characteristics, namely, high growth, large size, high volatility, and high trading volume. Our results survive multiple robustness tests.

Keywords: *worker layoff*; *corporate investment*; *firm characteristics.*

I. Introduction

There is a rich literature on worker layoffs influencing stock prices; see, for instance, Chen, Mehrotra, Sivakumar and Yu (2001), Hallock (1998), and Palmon, Sun, Tang (1997). The empirical evidence, consistent with theory, shows both a positive and a negative effect of worker layoffs on stock prices. Surprisingly though, the effect of worker layoffs on corporate investment is unknown. This paper takes the literature forward by testing and documenting the empirical relation between worker layoffs and corporate investment.

The intuition underlying the relationship between worker layoffs and corporate investment is simple: if worker layoffs, on the one hand, signal bad news about a firm's poor investment, which may also be a sign of financial distress, this may discourage corporate investment. This idea is consistent with the "declining investment opportunities" hypothesis proposed by Worrell *et al.* (1991). On the other hand, a layoff strategy, when used to boost efficiency through improving the financial position of a firm (an idea rooted in the "efficiency" or "competitive advantage" hypothesis proposed by Lin and Rozeff (1993) and Elayan, Swales, Maris and Scott (1998)), may actually help build a firm's reputation, thus encouraging corporate investment. In addition to these two hypotheses, the production theory and the capital–labor complementarity theory also help explain how worker layoffs potentially influence corporate investment. Consider the production theory. The main tenet of this theory has roots in the role capital and labor play in the production of goods. In a competitive environment, labor and capital are perceived as substitutable. To reduce costs and maximize profits, firms embrace more capital- and technology-intensive production methods at the cost of labor. This results in a positive relationship between capital and layoffs; in other words, layoffs signal higher capital intensity (CI), which by virtue of reducing the cost of production, stimulates corporate investment. The capital–labor complementarity theory, on the other hand, contends that both capital and labor are equally important for a firm. The main idea behind this

theory is that an increase in labor (capital), while keeping capital (labor) constant, will increase profits (see King, Plosser and Rebelo, 1988 and Greenwood, Hercowitz, and Krusell, 1997). This theory, therefore, implies that worker layoffs will have a negative effect on corporate investment. Based on these hypotheses and theories, a priori, worker layoffs can either have a positive or a negative effect on corporate investment. Therefore, we set forth the hypothesis that worker layoffs influence corporate investment. To test this hypothesis, first we collect a new data set on worker layoffs and corporate investment. Construction of our data set is dictated by the availability of worker layoff data. We consider data for the seven most developed countries; however, Italy drops out due to insufficient data. We end up with a sample spanning 2002–2015 and a cross-section that contains 761 firms. We control for the potential heterogeneous effect of worker layoffs on corporate investment. To this end, we believe that worker layoffs, because labor laws differ by country, could have differing effects on corporate investment in individual countries. To address this issue, in the second step, we form country-specific panels of firms and we model corporate investment.

We acknowledge that laying off workers in some sectors is relatively more common than in other sectors. Barbara and Campbell (2001), for instance, argue that technology-driven industries such as software and pharmaceuticals are characterized by high ratios of employee-to-capital costs. On the other hand, some sectors, such as telecommunications, are heavily capital intensive (CI), driven mostly by the growth of next generation technologies, including mobile telecommunications (Barbara and Campbell, 2001). Thus, the nature of jobs differs by sector. Some sectors are labor intensive while others are CI. Two outcomes are possible: (a) the sign and significance of the effects of layoffs on corporate investment will be sector-specific; or (b) CI firms may not be affected by worker layoffs. We control for sectoral effects by forming panels of firms on the basis of their sectoral classification. Specifically, we form 10 sector-based panels of firms using the Global Industry Classification scheme. We also

distinguish firms by CI and labor intensity. For example, for each country, we categorize firms into a CI or a labor-intensive panel.

Finally, stock characteristics are an important feature of large panel data sets. Layoffs may have a characteristic story; that is, large market capitalization (MV), high book-to-market (BM), high trading volume (TV), and high volatility (VO) firms may have a different experience with layoffs (and layoffs as a strategy) compared to small MV, low BM, low TV, and low VO firms. Whether these firm characteristics explain the corporate investment–worker layoff relation is an empirical question that we specifically address.

Our approach suggests that worker layoffs have a negative effect on corporate investment. Our specific findings are threefold. First, among country panels, we find evidence of layoffs influencing corporate investment for the U.S., U.K., and France. These three countries together constitute approximately 78% of the firms in our sample. There is no evidence that layoffs matter for corporate investment in Canada, Germany, or Japan, although in a global panel that includes all firms in our sample, the role of layoffs appears to be strong. Second, among sectors, the effect of layoffs is not uniform. Only 3 of the 10 sectors, namely, consumer services, health care, and technology, have corporate investment that responds negatively to worker layoffs. Finally, the results from firm characteristic–based panels suggest that layoffs influence corporate investment of large sized firms, growth (low book-to-market) firms, and firms with high TV. Further, while both high- and low-VO firms are affected by layoffs in our analysis, it is the corporate investment of high-VO firms that is more severely affected by layoffs.

These results hold across a range of robustness tests. Our first robustness test relates to the use of a different proxy for layoffs. Using both layoff number and layoff ratio (number as a percentage of total employees) we find that our result holds: layoffs negatively impact corporate investment. Our second robustness test relates to different measures of corporate

investment. Apart from employing the widely used measure of corporate investment (capital expenditure scaled by total assets from the previous year), we also use capital expenditure scaled by expenditure on property, plant, and equipment, and the growth rate of total assets. We find that our result, which supports a negative response of corporate investment to worker layoffs, not only holds but becomes stronger with alternative measures of corporate investment. Our third robustness test relates to panel formation, particularly with respect to the global panel that contains firms from all countries. We test how sensitive the global panel results are to exclusion of country-specific firms from this panel. To check this, we form six additional global panels, each time excluding firms of a particular country. In this way, we have, for example, a global panel of firms that excludes U.S. firms and a global panel that excludes Japanese firms. This is repeated for all the sample countries. We find that the results are sensitive to exclusion of country-specific firms, and that the strongest effect of layoffs on corporate investment is found when U.S. firms are included in the global panel. Our fourth robustness test addresses the implications of additional control variables. In the final robustness test, we check whether the effect of layoffs on corporate investment is influenced by the 2007 global financial crisis. From these final two tests, we confirm that our main result holds: worker layoffs exert a statistically significant and negative effect on corporate investment.

This paper relates to several strands of the literature. It is related to papers that examine whether worker layoffs affect stock prices. In this literature, the empirical evidence supports both a negative and a positive effect of worker layoffs on stock prices. We extend this literature by showing, to the best of our knowledge for the first time, that worker layoffs also influence corporate investment. In our analysis however, worker layoffs exert a negative effect on corporate investment, a result, as we demonstrate, that passes a range of robustness tests. By documenting evidence that worker layoffs exert a negative effect on corporate investment, we provide support to the theoretical arguments in favor of worker layoffs having a negative effect

on firm value. Given our approaches and findings, our study, to the best of our knowledge, is the first to generate empirical evidence suggesting that corporate investment responds to a strategy of worker layoffs.

This paper also relates to a considerable literature that seeks to identify and establish additional determinants of corporate investment. In this regard, the core investment model, as used in our paper, is augmented with political uncertainty (An, Chen, Luo, and Zhang, 2016; Julio and Yook, 2012), policy uncertainty (Gulen and Ion, 2016), financial crisis (Duchin, Ozbas and Sensoy, 2010), and a firm's dependence on banks (Gonzalez, 2016). These studies show that these factors are all statistically significantly related to corporate investment. Our work adds to this literature by showing that worker layoffs also matter to corporate investment.

This paper proceeds as follows. Section II discusses the data. The results appear in Section III. Finally, Section IV describes our conclusions.

II. Data

This section has two subsections. In the first, we explain the data set and its source. In the second, we summarize the data by way of several commonly reported statistics.

A. Data set

Our data set is unique as it is compiled specifically on firms that have laid-off workers over the period 2002 to 2015 and have corporate investment data available. All data are annual such that for each firm, we have 14 years of data. We compiled a data set for the seven most developed countries. However, Italy is excluded because it has very limited data on worker layoffs. We end up with 421 firms for the U.S., 108 firms for the U.K., 70 firms for Canada, 47 firms for France, 49 firms for Germany, and 66 firms for Japan.[1]

[1] Out of these, for the U.S., U.K., France, and Germany, there are 19, 5, 2, and 1 foreign firms, respectively. For Canada and Japan, there are no foreign-owned firms in our sample. We test whether excluding the foreign-owned firms from our global panel of all firms influences the result; we find that excluding these 27 firms from the global sample does not change our main result.

We create various panels of firms. First, we have a global panel that consists of all 761 firms. Second, we have six country-specific portfolios. Third, using the Global Industry Classification scheme, we categorize the 761 firms into 10 sectors, thus creating 10 sectoral panels, namely, basic materials (BaM), consumer goods (CG), consumer services (CS), financial (FI), health care (HC), industrial (IN), oil and gas (OG), technology (TE), telecommunication (TEL), and utilities (UT). Fourth, we create several stock characteristic–sorted panels, namely: (i) three BM ratio-based panels, from low BM (BM1) to high BM (BM3); (ii) three size-based panels, from low market capitalization (MV1) to high market capitalization (MV3); (iii) three TV-based panels, from low TV (TV1) to high TV (TV3); and (iv) three VO-based panels, from low VO (VO1) to high VO (VO3). In total, therefore, we have 29 panels of firms. Following the literature that models the determinants of corporate investment (see, Julio and Yook, 2012), we use the following control variables: cash flow (*CF*), Tobin's Q (*Q*), and growth rate of GDP (*GDP*). Detailed definitions of variables are provided in Appendix A. All data are downloaded from Datastream, except for GDP data, which are downloaded from the Global Financial Database.

B. Summary statistics

Table I presents summary statistics on our data set. Column 1 shows all 29 panels of firms. Column 2 lists the number of firms per panel. The 29 panels consist of a global panel of all firms, country-specific firm-based panels, sector-based panels, and stock characteristic–based panels. Note that there are large variations in corporate investment across samples of countries, sectors, and stock characteristics. The average corporate investment for a panel of all firms, for example, is 5.05% of prior-year total assets. The average corporate investment at the country level accounts for between 4.24% (France) and 7.88% (Canada) of prior-year total assets. This variation is starker at the sector level, where the average ranges from 1.08% (FI) to 12.80%

(OG). Five sectors (BaM, CS, OG, TEL, and UT) have average corporate investments in excess of the global panel average.

We now consider corporate investment for panels of firms formed on the basis of stock characteristics. Corporate investment declines with firm size, but increases with trading volume and volatility. Further, value firms (high BM firms) have higher corporate investments compared to growth firms (low BM firms). Reading standard deviations across the 29 panels of firms reveals a positive correlation between corporate investment and standard deviation. In other words, panels of firms, regardless of their characterization, are more volatile with higher corporate investment.

A strong pattern of heterogeneity is also observed from data on worker layoffs. Both the number of layoffs and layoffs as a percentage of total employees (layoff ratio) reveal a similar story. At the country level, for instance, annual average layoffs range from 152 (Canada) to 1,051 (Germany). At the sector level, layoffs range from 205 (OG) to 1,307 (TEL).

With respect to *CF* and *Q*, we observe similar heterogeneity. At the country level, cash flows (as a percentage of total assets) are highest for the U.S. (10.33%) and lowest for Japan (6.92%). At the sector level, by comparison, *CF* is much lower, ranging from 3.33% (FI) to 12.68% (OG). At the stock characteristic–based portfolio level, *CF* decreases with firm volatility and book-to-market ratio but increase with trading volume and size.

The incentive to invest, as reflected by *Q* (market value to book value of assets), is highest in the U.S. (3.08) and lowest in Japan (1.56). At the sector level, *Q* ranges from 2.06 (OG) to 3.78 (HC). At the stock characteristic–level, the incentive to invest declines with volatility and book-to-market ratio and increases with trading volume and size.

These descriptive statistics have two implications for the empirical analysis. The first implication is that across not only corporate investment and layoff variables, but also when considering firm characteristics of each of the 29 panels of firms, we discover that panels are

heterogeneous. This gives credence to our approach of forming a wide range of disaggregated panels based on countries, sectors, and stock characteristics. The second implication has roots in the magnitudes of mean values relating to each of the variables considered. The significant differences in magnitudes imply that the potential relationship between layoffs and corporate investment is likely to differ depending on the panel composition of firms.

III. Results

The results are described in three subsections. First, we present preliminary evidence on the relationship between worker layoffs and corporate investment. Specifically, we undertake an analysis of unconditional correlation and Granger causality between these two variables. Second, we run panel data regression models testing the effect of layoffs on corporate investment. Finally, we run a range of robustness tests.

A. Preliminary evidence

The objective of this section is to understand preliminary evidence on the relationship between worker layoffs and corporate investment before we embark on more rigorous tests. To accomplish this objective, we consider three tests: (i) a univariate analysis to capture corporate investments during layoff and non-layoff years; (ii) unconditional correlations between worker layoff and corporate investment; and (iii) a Granger causality test, aimed at understanding the direction of causation between these two variables.

Let us begin with a univariate analysis. The results are reported in Table II. Of the 29 panels, except for Japan, in all panels corporate investment is, on average, higher in years without layoffs compared to layoff years. In 22/29 (76%) panels, the difference in corporate investments between layoff and non-layoff years is statistically different from zero. Of these panels, on average across countries, corporate investment in non-layoff years is 12.93% higher compared to layoff years. Across statistically significant sectors, corporate investment is, on average, 16.09% higher in non-layoff years. With respect to stock characteristic–based panels,

non-layoff years have corporate investment 17.72% higher than corporate investment in layoff years. This implies that for the majority of firm-panels, there is statistical evidence favoring the importance of layoffs for corporate investment.

We turn now to the unconditional correlations, which are reported in Table III. Two results deserve particular mention. First, there are 20 panels for which the unconditional correlations are statistically different from zero. Second, for all panels where unconditional correlations are statistically different from zero, the relation is negative, suggesting that worker layoffs have a negative effect on corporate investment. These results are consistent with our earlier observation that corporate investment is lower in layoff years compared to non-layoff years.

To conclude our analysis of the preliminary evidence on the relationship between corporate investment and worker layoffs, we test for the direction of causation using the familiar Granger (1961) causality test. The results are reported in Table IV. Four hypotheses are tested: (i) that corporate investment does not Granger cause layoffs (column 2); (ii) that layoffs do not Granger cause corporate investment (column 3); (iii) that corporate investment does not Granger cause the layoff ratio (column 4); and (iv) that the layoff ratio does not Granger cause corporate investment (column 5). The null hypothesis is tested based on the *p*-value. Neither when using layoff number nor layoff ratio can the null hypothesis that layoffs do not Granger cause investment be rejected. Therefore, there is no evidence that corporate investment Granger causes layoffs. However, we find that when using layoff number (layoff ratio) in 23/29 (17/29) panels, the null of no Granger causality running from layoffs to corporate investment is rejected. Therefore, from the Granger causality test, we find reasonable evidence suggesting that layoffs Granger cause corporate investment.

The main message emerging from these three tests is that layoffs do influence corporate investment for most of the firms in our sample. Let us now turn to more rigorous regression analysis and robustness tests.

B. Regression analysis

Our main regression model testing the hypothesis that worker layoffs influence corporate investment is predicated on a standard investment-type specification widely used in the literature (see, for instance, Julio and Yook, 2012), and has the following form:

$$INV_{\mathrm{i,t}} = \alpha + \beta_1 * LAYOFF_{\mathrm{i,t}} + \beta_2 * Q_{\mathrm{i,t-1}} + \beta_3 * CF_{\mathrm{i,t}} + \beta_4 * GDP_{\mathrm{i,t-1}} + \varepsilon_{i,t} \qquad (1)$$

In this equation, i and t index firm and time, respectively. The dependent variable, investment (*INV*), is defined as capital expenditure scaled by total assets in the preceding year. The variable *LAYOFF* is either the number of worker layoffs (in natural log form) or the layoff ratio (number of layoffs scaled by total employees). A key feature of investment models is the role played by the incentive to invest, which typically is captured using a measure of *Q*. In our data set, we take the ratio of the market value of assets to the book value of assets at the beginning of the year as a proxy for *Q*. *CF* is measured as earnings before interest and taxes minus taxes and interest expense plus depreciation and amortization. In investment models such as ours, it is common to control for general economic conditions. The way the literature (see Julio and Yook, 2012; and Gulen and Ion, 2015) models this is through using the growth rate of GDP; we do the same. As is common practice, standard errors are clustered at the firm level to correct for potential cross-sectional and serial correlation in the regression's error term, $\varepsilon_{i,t}$. Firm effect is also modeled using a panel fixed effect model.

Before we examine the outcomes from the regression model, a note on the integration property of the variables is in order. We test for the integration property of each of the variables by implementing the Im, Pesaran and Shin (2013) panel unit root test, which examines the null

hypothesis of a panel unit root. The results, reported in Table V, imply that all variables in our model are panel non-stationary. This ensures that our estimates are free of any bias resulting from the persistency of the explanatory variables.

The results on the effect of worker layoffs on corporate investment are presented in Table VI. There are three features of these results. The first feature relates to the sign of the effect of worker layoffs on corporate investment. In 23/29 panel models, the sign is negative, suggesting that worker layoffs reduce corporate investment. The second feature relates to the statistical significance of the results. At the country level, when using log of layoffs as a determinant, we find that when a global panel of all firms, U.S. firms, U.K. firms, and French firms are considered, layoffs have a negative and statistically significant effect. A one standard deviation increase in layoff reduces corporate investment for the global panel by 0.054%. The effect on U.S. firms is even larger at 0.065%, followed by a 0.058% and 0.045% reduction in corporate investment in the U.K. and France, respectively. By comparison, when using layoff ratio, the effect is statistically different from zero only for the global panel and the U.S. panel of firms.

At the sector level, the statistically significant effect is stronger when using layoff number (2/10 sectors) versus using layoff ratio (1/10 sectors). Two specific outcomes are of note here: (i) layoffs do not affect corporate investment in all sectors, which is just as expected and demonstrated earlier using descriptive statistics; and (ii) the magnitude of effect from a one standard deviation increase in layoffs on corporate investment at the sector level ranges from -0.056% to -0.217%. Considering panels characterized by stock characteristics, we discover the following:

- Among MV-based panels of firms, only large firms are affected. A one standard deviation increase in layoff reduces corporate investment by 0.017% to 0.038%.

- When taking BM-sorted panels, we find that both layoff number and layoff ratio suggest that it is the growth firms that are most statistically significantly affected. A one standard deviation increase in layoff reduces corporate investment by 0.068% to 0.124%.
- With TV–sorted portfolios, it is only the firms with the highest trading volume that experience a decline in corporate investment; a one standard deviation increase in layoff results in a reduction in corporate investment of 0.036% to 0.060%, depending on the measure of layoff.
- With VO-based panels, we find that a panel of most and a panel of least volatile firms are negatively affected by layoff, although corporate investment of the most volatile stocks is more severely affected by layoffs.
- On the whole, the most affected panels based on stock characteristics are growth firms (lowest BM firms) and high VO firms.

Of the other determinants of corporate investment, as expected, *Q* and *GDP* turn out to be the most successful determinants, being statistically different from zero in at least 24/29 panels. Adjusted R-squared ranges from 31.2% to 79.0%.

C. Explanation of the results

We have two sets of results, one at the country level and one at the sector level. To summarize, evidence on the relation between worker layoff and corporate investment suggests that layoffs have a negative and statistically significant effect on corporate investment in the U.S., U.K., and France. These three countries make up around 78% of the firms in our sample. For the other three countries (Canada, Germany, and Japan) there is no statistical relationship. These results imply that (a) worker layoffs have a statistically significant influence on corporate investment in the U.S., U.K., and France, and (b) the evidence of a negative relationship between worker layoff and corporate investment is consistent with the capital–labor

complementarity theory and the declining investment hypothesis. One thing common to the U.S., U.K., and France compared to Canada, Germany, and Japan is that, over the period for which data are available (1990–2014), the share of labor compensation costs (STLC) in GDP are stable. These three countries also have the least volatility in labor share of GDP compared to Canada, Germany, and Japan (see Figure I). For Canada, STLC in GDP declined most, from around 60% to around 55%. Japan (2.87%) and Canada (2.01%) experienced the highest volatility in STLC in GDP, followed by Germany (1.87%). The message from these statistics is clear: the role of labor has been stable over a long period of time for the U.S., U.K., and France but not for Canada, Japan, and Germany. Therefore, layoffs in the U.S., U.K., and France tend to hurt corporate investment.

Another way to explain these country level effects of corporate investment is by examining labor laws and regulations regarding layoffs. Data from the World Bank suggest that the U.S. and U.K. have the least stringent rules/regulations when it comes to laying off workers. More specifically, the redundancy rules and costs appear to suggest that it is relatively easy to lay off workers in the U.S. and U.K. (see Table VII).

We do not have corresponding detailed capital and labor compensation data for the sectors we model. However, for the period 2002–2015, we compute CI for each of the 10 sectors by country. Our approach to computing CI follows Chen, Ge, Lai, and Wan (2013). Essentially, we scale total assets by total employment per firm. Firms with a higher value of total assets to total employment have higher CI. Panel A of Table VIII presents CI by sector for each country, while Panel B provides a rank of CI for each sector within each country. The rank is from 1 (representing the sector with the highest CI) to 10 (representing the sector with the lowest CI). We observe that the three sectors (CS, HC, and TE) where worker layoffs negatively impact corporate investment are those that have among the lowest CI. Consider the CS sector. Except for Japan and the U.S., where CI ranks 2/10 and 4/10, respectively, the CI

of CS in other countries is lower than most other sectors. Similarly, CI for the TE sector ranks last in the U.K. and Canada and second-to-last in the U.S. and France. For the HC sector, we note that except for the U.K., where CI ranks 5/10, CI is less than 70% of the other sectors. These results imply that with relatively low CI, labor in these sectors is relatively more important. Therefore, consistent with the capital–labor complementarity hypothesis, worker layoffs in these sectors hurt corporate investment.

Our final intervention relates to isolating the CI of firms. Our hypothesis here is that panels of firms with low CI should show a greater effect of worker layoffs than firms with high CI. Our approach to computing CI follows Chen, Ge, Lai, and Wan (2013). Essentially, we scale total assets by total employment per firm. Firms with a higher value of total assets to total employment have higher CI. We categorize firms into high and low CI. Firms with CI > mean CI are categorized into a high-CI panel, whereas firms with CI < mean CI are categorized into a low-CI panel. In this way, we form CI-based panels for a global sample of all firms and for firms of each country. The results are reported in Table IX.

Let us consider first the results from Panel A. Using *INV* as a dependent variable for the global panel and the U.K. panel of firms, we find evidence in favor of our proposed hypothesis. That is, low-CI firms are negatively and statistically significantly affected by layoffs. The effect becomes clearer when using *INV1* as a proxy for corporate investment. Here, we find that low-CI global firms and low-CI German firms are negatively and statistically significantly affected by layoffs. The results for the U.S. and U.K. also support our proposed hypothesis. In these two countries, while both high- and low-CI firms are negatively and statistically significantly affected by layoffs, the magnitude of the effect is stronger for panels of low-CI firms. These results are reinforced when using *INV2* as a proxy for corporate investment. The results presented in Panel B when using layoff ratio corroborate the findings

reported in Panel A, suggesting that support for our proposed hypothesis is robust to the measure of layoff used.

D. Robustness tests

One clear outcome from our analysis is that regardless of whether we use the number of worker layoffs or layoff ratio, the result holds that layoffs influence corporate investment. We undertake additional analysis to check the robustness of our results. Specifically, we mount four additional lines of inquiry. First, we check whether our results hold when using alternative proxies for corporate investment, our dependent variable. Second, we check how sensitive our results are to various country-based panel formations. Third, we examine whether our results are sensitive to an alternative regression specification that accommodates a large number of control variables. Finally, we check whether the effects of layoffs on corporate investment hold when the 2007 global financial crisis is specifically controlled for.

D1. Alternative proxies for corporate investment

It is important to acknowledge that the literature that models the determinants of corporate investment frequently uses change in investment as an additional measure of investment (see, for example, An *et al.*, 2016). We also use this measure. Our results on the role played by worker layoffs in influencing the change in corporate investment are very similar to the results from using the level of corporate investment. For this reason, we do not report the results here but they are available upon request. We, however, use two additional measures of corporate investment: capital expenditure in the current year scaled by property, plant, and equipment expenditure of the previous year (*INV1*),[2] and total asset growth rate (*INV2*).[3] The regression

[2] Several studies use this measure of investment; see, inter alia, González (2016); Eisdofer *et al.* (2013); Kahle and Stulz (2013); Duchin *et al.* (2010); Korkeamaki and Moore (2004); Kaplan and Zingales (1997); Mayers (1998); and Hoshi *et al.* (1991).
[3] For studies that use this measure of investment, see Asker *et al.* (2015) and Alzahrani (2006).

results when using *INV1* and *INV2* as dependent variables are reported in Tables X and XI, respectively. A general observation from these results is that with alternative measures of corporate investment, the results become stronger, particularly when using *INV2* as a dependent variable. With *INV2*, for instance, when using layoff number (layoff ratio) in 24 (23) out of the 29 panels, layoffs contribute negatively and statistically significantly to corporate investment. At a minimum, we conclude from these additional tests that our findings hold and, if anything, the effect of layoff on corporate investment becomes stronger with alternative measures of corporate investment. In other words, while our results on the effect of layoff on corporate investment are sensitive to the definition of corporate investment, they do not detract from the notion that layoffs influence corporate investment.

D2. Alternative panel formations

One of our strongest results relates to the role played by layoffs when all firms are considered as a panel (global panel). We must ask whether the composition of the global panel, if changed, would render the effect of layoffs on corporate investment robust. Our approach to addressing this question is to, one at a time, exclude from the global panel firms headquartered in one of the six countries. This yields six global panels that exclude (i) U.S., (ii) U.K., (iii) Canada, (iv) France, (v) Germany, and (vi) Japan. The results based on *INV*, *INV1*, and *INV2* as dependent variables are reported in Table XII. The key message from these additional panel regression models is that two of the three proxies for corporate investment reveal that excluding U.S. firms from the global panel renders the role of layoffs statistically insignificant. By comparison, excluding each of the other five countries from the global panel does not change our main finding that layoffs influence corporate investment. The implication, then, is that it is U.S. firms in the global panel that drive the statistically significant relationship between layoffs and

corporate investment. This is not a surprising outcome, because U.S. firms make up 55% of our sample of firms.

D3. Alternative specification of the investment model

Thus far, while we have closely followed the literature in specifying a panel regression model of the determinants of corporate investment, strictly speaking, we have not controlled for other variables that have been shown to matter to corporate investment. In this regard, in a recent study, An *et al.* (2016) use a range of additional control variables. Inspired by this study, as part of our robustness story, we test whether our results on the effect of layoffs on corporate investment are influenced by the specification of the regression model. To test this proposition, we propose the following augmented panel regression model of the determinants of corporate investment:

$$INV_{\mathrm{i,t}} = \alpha + \beta_1 * LAYOFF_{\mathrm{i,t}} + \beta_2 * GROWTH_{\mathrm{i,t-1}} + \beta_3 * LEVERAGE_{\mathrm{i,t-1}} + \beta_4 * CASH_{\mathrm{i,t-1}} + \beta_5 * AGE_{\mathrm{i,t-1}} + \beta_6 * SIZE_{\mathrm{i,t-1}} + \beta_7 * GDP_{\mathrm{i,t}} + \beta_8 * INV_{\mathrm{i,t-1}} + \varepsilon_{i,t} \quad (2)$$

In this equation, i and t index firm and time, respectively. The dependent variable, *INV*, is defined as capital expenditure scaled by total assets in the preceding year. As before, two proxies for layoff are used, namely, the log of the number of worker layoffs and the layoff ratio (layoffs scaled by total employees). Any persistence in investment is captured by the one-period lagged dependent variable. As a proxy for the incentive to invest, we use: sales growth (*GROWTH*), which is simply change in sales scaled by previous year sales; leverage (*LEVERAGE*), which is computed as total debt scaled by total assets; and, cash holdings (*CASH*), which is computed as current assets minus accounts receivable and inventory, scaled by total assets. We also use firm age (*AGE*) and firm size (*SIZE*) as controls, and GDP growth rate (*GDP*) to capture general economic conditions in the previous year, which may influence current-year investment decisions.

The results are presented in Table XIII. There are three features of these results on the effect of worker layoff on corporate investment; the first feature relates to the sign. In 22 (worker layoff number) and 23 (layoff ratio) out of 29 panel models, the sign is negative, suggesting that worker layoffs reduce corporate investment. The second feature relates to the statistical significance of the results. At the country level, we find that when a global panel of all firms, U.S. firms, and Japanese firms are considered, layoffs have a negative and statistically significant effect. A one standard deviation increase in layoff reduces corporate investment for the global panel by 0.041% (0.020%) when using layoff number (layoff ratio). For the U.S. panel of firms, the magnitude of decline in corporate investment is much higher, between 0.106% and 0.071%. Finally, for Japan, only layoff ratio influences corporate investment. For the remainder of the sample countries, neither layoff number nor layoff ratio shows any statistically significant relationship between layoffs and corporate investment. At the sector level, the statistically significant effect is weaker using layoff number (1/10 sectors) versus using layoff ratio (2/10 sectors). The main finding here is that layoffs do not affect corporate investment in all sectors, which is just as expected and demonstrated earlier using descriptive statistics showing that some sectors have extremely low layoffs.

The results obtained for panels of firms characterized by stock characteristics are summarized as follows:

- Among size-based panels of firms, both medium and large sized firms are affected. A one standard deviation increase in layoff reduces corporate investment by 0.056% (medium) and 0.039% (large).
- When taking BM sorted panels, the effect of layoff suggests that it is growth firms that are most statistically significantly affected. A one standard deviation increase in layoff reduces corporate investment by up to 0.099%.

- With TV-sorted portfolios, it is the middle-third and the largest TV firms that are negatively and significantly affected—the decline in corporate investment from a one standard deviation increase in layoff is 0.092% (middle) and 0.049% (largest).
- With VO-based panels, we find that it is the panel of the least and most volatile firms that see a decline in corporate investment. The most volatile firms are most affected (0.13% decline in corporate investment) compared to the least volatile firms (0.041% decline in corporate investment).

D4. Effects of layoffs controlled for the global financial crisis

To control for the 2007 global financial crisis, we augment Equation (1) with a crisis dummy variable as follows:

$$INV_{\mathrm{i,t}} = \alpha + \beta_1 * LAYOFF_{\mathrm{i,t}} + \beta_2 * Q_{\mathrm{i,t-1}} + \beta_3 * CF_{\mathrm{i,t}} + \beta_4 * GDP_{\mathrm{i,t-1}} + \beta_5 * CRISIS + \varepsilon_{i,t} \quad (3)$$

where *CRISIS* is the financial crisis dummy variable, which takes a value of 1 if the year is 2007, 2008, or 2009, and 0 otherwise. The results for β_1 (effect of layoff) and β_5 (effect of crisis) are reported in Table XIV. Specifically, the slope coefficient and the t-statistic testing the null hypothesis that the slope coefficient is zero are reported together with the adjusted R-squared. These results are reported by running three regression models, each with a different dependent variable. In other words, consistent with the robustness test undertaken in Section D1, we use three proxies for corporate investment. Our main finding is that the results on the effects of worker layoffs on corporate investment are consistent with those reported earlier. From this exercise, we conclude that the 2007 global financial crisis did not in any way influence the relation between worker layoff and corporate investment.

IV. Concluding remarks

This paper analyzes the effect of worker layoffs on corporate investment for a sample of 761 firms that belong to the six most developed countries. In addition to a global panel of all firms and six country-specific panels of firms, we categorize firms into 10 sectors and into 12 panels constructed using firm characteristics, such as book-to-market ratio, size, trading volume, and volatility. Our findings suggest that not all firms react statistically significantly to worker layoffs. Where a statistically significant effect exists, the relation is dependent on the country, sector, and stock characteristics of the firm. Our hypothesis test is subjected to a range of robustness tests, including: (i) regression models that use multiple proxies for the dependent variable, corporate investment; (ii) several panel formations; (iii) an alternative regression model specification; and (iv) a control for the 2007 financial crisis. Our main finding showing that worker layoffs affect corporate investments becomes stronger in the additional tests we undertake. Our results, therefore, suggest that worker layoffs do matter to corporate investment, and this has three important implications.

The first implication relates to firm managers directly: corporate layoffs—a strategic policy decision to rein in the financial position of a firm—may come at the cost of lower corporate investment. The second implication is that the effect of corporate layoffs is not homogeneous. On average, corporate investment does not significantly react to layoffs in all countries. Similarly, layoffs have a sector-based message. That is, not all sectoral corporate investment reacts significantly (negatively) to layoffs. Therefore, it seems that layoffs as a strategy may be successfully (that is, without impacting corporate investment) implemented in some sectors more than others. Finally, in our analysis, corporate investments and layoffs have a stock characteristic dimension; that is, how exactly corporate investment reacts to layoffs is dependent on firm characteristics.

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Figure I: Share of total labor compensation in GDP

This figure plots time-series data on the percentage share of labor compensation in GDP for each of the six countries, namely, the U.S., U.K., Japan, Germany, France, and Canada. The data is annual and for the period 1990 to 2014. The data is obtained from: The Conference Board. 2015. The Conference Board Total Economy Database™, September 2015, http://www.conference-board.org/data/economydatabase/.

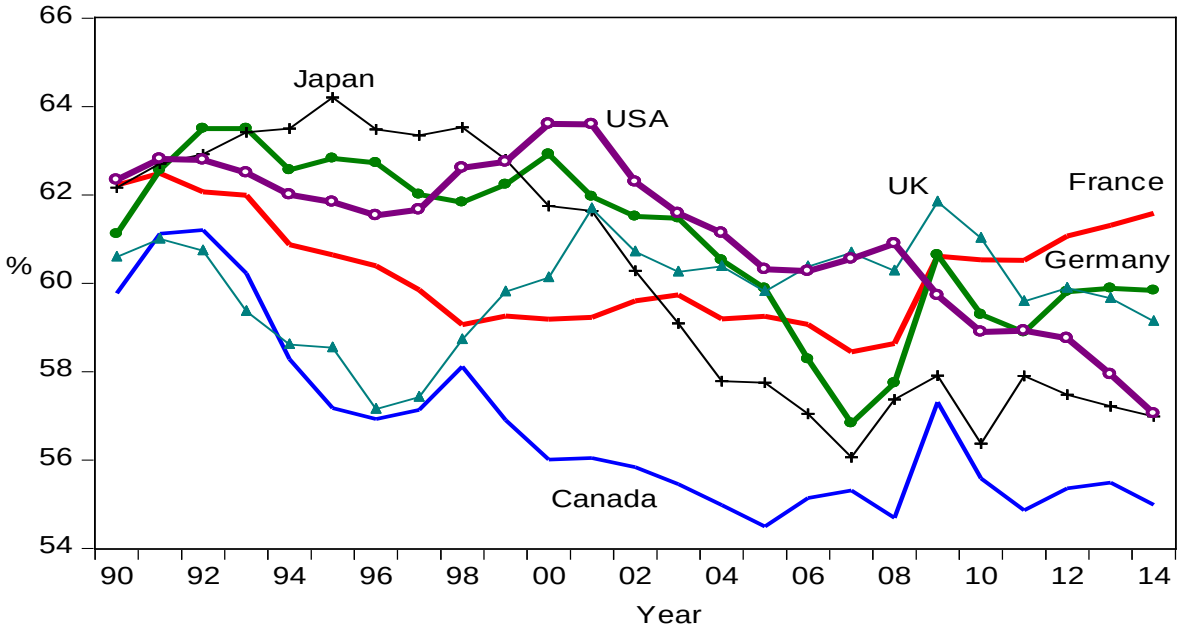

Table I: Summary statistics.

This table reports the number of firms and the average value of variables and its standard deviation for global and six country panels, 10 sectoral panels, and 12 panels sorted by firm characteristic variables, namely market value (MV), book-to-market ratio (BM), trading volume (TV), and return volatility (VO) from 1 (low) to 3 (high). The variables: corporate investment (INV), layoff number, layoff ratio, Tobin Q, cash flow, and GDP growth. The definition of variables are reported in Appendix A.

	No. of firm	INV		Layoff number		Layoff ratio		Tobin Q		Cash flow		GDP growth	
		Mean (%)	SD	Mean	SD	Mean (%)	SD	Mean	SD	Mean (%)	SD	Mean (%)	SD
Global	761	5.05	5.50	422	2,220	0.85	3.55	2.72	2.11	9.51	9.02	1.64	1.77
U.S.	421	4.77	5.35	333	1,596	0.82	3.10	3.08	2.40	10.33	9.82	1.84	1.58
U.K.	108	4.85	4.43	582	3,472	1.05	4.35	2.93	2.35	9.48	9.09	1.71	1.87
Canada	70	7.88	9.34	152	782	0.99	5.42	2.33	1.87	8.83	9.10	1.98	1.54
France	47	4.24	3.23	508	2,112	0.57	2.55	1.96	1.65	8.26	7.75	1.04	1.37
Germany	49	5.16	4.43	1,051	3,847	0.88	3.03	2.16	1.79	8.10	7.31	1.08	2.36
Japan	66	4.62	3.00	481	2,372	0.70	3.23	1.56	1.40	6.92	7.08	0.77	2.22
Basic Materials	68	7.48	8.32	419	2,609	1.25	4.89	2.43	2.04	8.54	8.60	1.75	1.73
Consumer Goods	127	4.62	3.27	479	2,138	0.81	2.86	2.99	2.01	9.89	9.59	1.51	1.86
Consumer Services	124	6.43	7.78	219	1,317	0.40	1.75	2.88	2.32	11.68	10.36	1.71	1.70
Financials	72	1.08	2.55	716	3,546	1.31	5.24	2.08	1.66	3.33	1.82	1.64	1.77
Healthcare	51	3.33	2.39	436	1,878	1.10	4.02	3.78	3.01	11.42	11.29	1.60	1.82
Industrials	178	4.15	3.22	342	1,777	0.59	2.75	2.58	2.12	8.76	8.54	1.62	1.80
Oil & Gas	27	12.80	7.62	205	935	0.70	2.64	2.06	1.77	12.68	12.98	1.77	1.65
Technology	70	4.26	3.90	514	2,394	1.38	4.82	3.07	2.48	12.12	11.64	1.68	1.73
Telecommunications	15	7.70	3.04	1,307	4,735	1.11	3.51	2.59	2.10	11.90	12.56	1.75	1.71
Utilities	29	6.49	2.44	297	1,461	0.81	3.33	2.09	1.66	6.67	6.67	1.69	1.74
MV1	254	5.61	7.33	139	778	0.84	3.81	2.20	1.80	8.82	8.37	1.70	1.76
MV2	254	4.96	4.55	271	1,738	0.75	3.52	2.65	2.16	9.60	8.98	1.62	1.79
MV3	253	4.57	3.96	857	3,301	0.95	3.30	3.32	2.45	10.10	9.73	1.62	1.78
BM1	254	5.12	5.88	301	1,486	0.80	3.12	4.14	3.52	12.08	11.59	1.75	1.69
BM2	254	4.56	3.98	424	2,160	0.79	3.37	2.40	2.13	9.14	8.72	1.64	1.76
BM3	253	5.47	6.33	540	2,811	0.96	4.09	1.68	1.40	7.27	6.97	1.54	1.85
TV1	254	4.94	5.12	287	1,864	0.70	3.45	2.40	1.95	9.36	8.94	1.62	1.83
TV2	254	4.99	5.99	205	1,007	0.71	3.18	2.94	2.32	9.31	8.99	1.70	1.70
TV3	253	5.21	5.34	774	3,184	1.14	3.96	2.83	2.08	9.86	9.14	1.61	1.79
VO1	254	4.04	3.32	485	2,373	0.70	2.71	3.44	2.65	10.18	9.68	1.75	1.69
VO2	254	4.62	3.99	396	2,121	0.82	3.52	2.49	2.01	9.47	8.90	1.57	1.84
VO3	253	6.50	7.80	384	2,158	1.03	4.25	2.24	1.77	8.86	8.45	1.62	1.79

Table II: Univariate analysis

This table reports the average values of corporate investment in the years with layoff versus the years without layoff. The difference and t-statistic for the null hypothesis that the difference is equal zero are also reported.

	Layoff	Non-layoff	Difference	t-statistic
Global	4.38	5.23	-0.86	-6.62
U.S.	4.09	4.98	-0.89	-5.40
U.K.	4.20	5.01	-0.80	-2.76
Canada	6.88	8.09	-1.21	-1.52
France	3.82	4.40	-0.57	-2.01
Germany	4.81	5.26	-0.45	-1.12
Japan	4.82	4.58	0.23	0.84
Basic Materials	6.99	7.61	-0.63	-0.94
Consumer Goods	4.33	4.72	-0.38	-2.11
Consumer Services	5.35	6.68	-1.33	-2.77
Financials	0.50	1.27	-0.77	-3.99
Healthcare	2.69	3.51	-0.82	-3.84
Industrials	3.66	4.29	-0.63	-4.04
Oil & Gas	10.62	13.30	-2.68	-2.68
Technology	4.16	4.29	-0.12	-0.41
Telecommunications	7.06	8.02	-0.96	-2.17
Utilities	6.48	6.49	-0.01	-0.04
MV1	5.18	5.69	-0.51	-1.50
MV2	4.55	5.06	-0.52	-2.67
MV3	3.84	4.89	-1.05	-7.24
BM1	4.29	5.36	-1.07	-4.51
BM2	4.12	4.68	-0.56	-3.45
BM3	4.74	5.68	-0.94	-3.59
TV1	4.40	5.05	-0.65	-2.85
TV2	4.21	5.19	-0.97	-3.86
TV3	4.48	5.50	-1.02	-5.10
VO1	3.37	4.25	-0.88	-6.82
VO2	4.28	4.71	-0.43	-2.68
VO3	5.82	6.66	-0.84	-2.47

Table III: Unconditional correlation

This table reports the unconditional correlation between the corporate investment with the layoff number and layoff ratio. The t-statistic for the null hypothesis that the correlation is equal zero is also reported.

	Layoff number		Layoff ratio	
	Correlation	t-statistic	Correlation	t-statistic
Global	-0.065	-6.69	-0.030	-3.03
U.S.	-0.077	-5.89	-0.062	-4.74
U.K.	-0.069	-2.65	-0.022	-0.82
Canada	-0.044	-1.37	-0.011	-0.34
France	-0.062	-1.59	0.018	0.47
Germany	-0.026	-0.68	-0.016	-0.42
Japan	0.039	1.15	-0.051	-1.69
Basic Materials	-0.033	-1.00	0.016	0.50
Consumer Goods	-0.025	-1.06	-0.059	-2.48
Consumer Services	-0.070	-2.91	-0.066	-2.74
Financials	-0.134	-4.08	-0.037	-1.12
Healthcare	-0.154	-4.12	-0.122	-3.25
Industrials	-0.077	-3.83	0.017	0.82
Oil & Gas	-0.140	-2.73	-0.041	-0.79
Technology	-0.015	-0.46	-0.049	-1.73
Telecommunications	-0.148	-2.15	0.011	0.16
Utilities	-0.013	-0.25	-0.049	-1.53
MV1	-0.026	-1.52	-0.035	-2.05
MV2	-0.043	-2.53	-0.004	-0.21
MV3	-0.117	-6.90	-0.066	-3.89
BM1	-0.080	-4.76	-0.041	-2.40
BM2	-0.061	-3.60	-0.039	-2.29
BM3	-0.059	-3.43	-0.017	-0.98
TV1	-0.034	-2.02	-0.018	-1.09
TV2	-0.072	-4.25	-0.027	-1.66
TV3	-0.095	-5.60	-0.051	-2.98
VO1	-0.113	-6.72	-0.053	-3.15
VO2	-0.037	-2.19	-0.028	-1.65
VO3	-0.050	-2.94	-0.039	-2.31

Table IV: Granger causality test

This table reports the p-value of the Granger causality test among corporate investment and layoff variables, namely corporate investment (INV), layoff number (LN), and layoff ratio (LR). The symbol "≠>" means "does not Granger-cause".

	INV ≠> LN	LN ≠> INV	INV ≠> LR	LR ≠> INV
Global	0.33	0.00	0.98	0.00
U.S.	0.53	0.00	0.31	0.00
U.K.	0.88	0.04	0.99	0.73
Canada	0.48	0.04	0.72	0.22
France	0.64	0.25	0.31	0.64
Germany	0.39	0.37	0.70	0.15
Japan	0.04	0.00	0.64	0.00
Basic Materials	0.58	0.01	0.40	0.38
Consumer Goods	0.20	0.05	0.21	0.01
Consumer Services	0.24	0.15	0.09	0.18
Financials	0.07	0.05	0.69	0.10
Healthcare	0.56	0.00	0.97	0.00
Industrials	0.67	0.00	0.05	0.00
Oil & Gas	0.57	0.20	0.01	0.52
Technology	0.28	0.05	0.45	0.16
Telecommunications	0.69	0.57	0.43	0.78
Utilities	0.19	0.01	0.37	0.08
MV1	0.63	0.02	0.39	0.02
MV2	0.45	0.00	0.06	0.04
MV3	0.11	0.00	0.60	0.01
BM1	0.17	0.25	0.26	0.19
BM2	0.83	0.00	0.54	0.01
BM3	0.87	0.00	0.35	0.01
TV1	0.77	0.01	0.69	0.14
TV2	0.17	0.02	1.00	0.01
TV3	0.33	0.00	0.83	0.00
VO1	0.12	0.00	0.31	0.00
VO2	0.60	0.00	0.93	0.01
VO3	0.97	0.00	0.60	0.01

Table V: Unit root test

This table reports the p-value of Im, Pesaran and Shin (IPS) panel unit root tests. The p-value examines the null hypothesis that the variable has a unit root.

	INV	LN	LR	Tobin Q	CF	GDP
Global	0.00	0.00	0.00	0.00	0.00	0.00
U.S.	0.00	0.00	0.00	0.00	0.00	0.00
U.K.	0.00	0.00	0.00	0.02	0.00	0.00
Canada	0.00	0.00	0.00	0.02	0.00	0.00
France	0.00	0.00	0.00	0.01	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00
Japan	0.00	0.00	0.00	0.00	0.00	0.00
Basic Materials	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Goods	0.00	0.00	0.00	0.03	0.00	0.00
Consumer Services	0.00	0.00	0.00	0.00	0.00	0.00
Financials	0.00	0.00	0.00	0.00	0.00	0.00
Healthcare	0.00	0.00	0.00	0.00	0.00	0.00
Industrials	0.00	0.00	0.00	0.00	0.00	0.00
Oil & Gas	0.00	0.00	0.00	0.00	0.00	0.00
Technology	0.00	0.00	0.00	0.02	0.00	0.00
Telecommunications	0.00	0.00	0.00	0.00	0.01	0.00
Utilities	0.00	0.00	0.00	0.01	0.00	0.00
MV1	0.00	0.00	0.00	0.00	0.00	0.00
MV2	0.00	0.00	0.00	0.00	0.00	0.00
MV3	0.00	0.00	0.00	0.05	0.00	0.00
BM1	0.00	0.00	0.00	0.00	0.00	0.00
BM2	0.00	0.00	0.00	0.00	0.00	0.00
BM3	0.00	0.00	0.00	0.00	0.00	0.00
TV1	0.00	0.00	0.00	0.00	0.00	0.00
TV2	0.00	0.00	0.00	0.00	0.00	0.00
TV3	0.00	0.00	0.00	0.00	0.00	0.00
VO1	0.00	0.00	0.00	0.06	0.00	0.00
VO2	0.00	0.00	0.00	0.00	0.00	0.00
VO3	0.00	0.00	0.00	0.00	0.00	0.00

Table VI: Estimation results

This table reports the regression results of corporate investment on layoff using panel fixed effect approach. The regression model takes the following form:

$$INV_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * Q_{i,t-1} + \beta_3 * CF_{i,t} + \beta_4 * GDP_{i,t-1} + \varepsilon_{i,t}$$

The coefficient and its t-statistic are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Layoff number											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.026*	-1.67	0.134***	5.91	0.050**	2.20	0.155***	4.47	3.949***	15.35	0.633
U.S.	-0.033*	-1.73	0.102***	4.72	0.071***	4.79	0.179***	3.68	3.422***	16.52	0.770
U.K.	-0.036**	-2.25	0.021	0.99	0.062***	2.60	0.162***	3.52	3.894***	12.84	0.679
Canada	-0.078	-0.97	0.601***	2.75	-0.100	-0.66	0.302***	2.58	6.828***	4.81	0.344
France	-0.041*	-1.75	0.181***	3.02	0.047	0.95	0.120***	3.27	3.442***	8.11	0.546
Germany	0.017	0.42	0.215*	1.94	0.194***	3.90	0.077	1.62	2.884***	7.45	0.569
Japan	-0.008	-0.23	0.067	0.76	0.022	1.15	0.084	0.98	4.282***	26.55	0.723
Basic Materials	0.035	0.62	0.792***	3.85	-0.103	-0.83	0.231***	3.44	6.107***	4.98	0.312
Consumer Goods	-0.020	-0.62	0.033*	1.80	0.050**	2.08	0.096*	1.70	3.872***	15.18	0.610
Consumer Services	-0.066**	-2.51	0.107**	2.34	0.125***	5.93	0.254***	4.77	4.219***	15.95	0.710
Financials	-0.034	-1.46	0.148***	2.88	-0.011	-0.16	0.167***	4.75	4.389***	6.91	0.605
Healthcare	-0.064**	-2.28	0.252***	2.66	-0.040*	-1.83	0.067*	1.73	2.680***	10.67	0.436
Industrials	0.000	0.01	0.045*	1.95	0.072***	3.28	0.196***	4.20	3.064***	17.41	0.679
Oil & Gas	-0.117	-1.04	1.677***	5.18	0.244***	2.57	-0.158	-1.17	6.502***	5.76	0.592
Technology	-0.046	-1.18	0.041**	2.03	0.100***	6.41	0.179***	3.32	2.633***	10.30	0.649
Telecommunications	0.015	0.61	-0.002	-0.08	0.034	0.80	0.084**	2.04	7.047***	11.88	0.760
Utilities	-0.007	-0.85	0.156***	3.32	0.026	1.61	0.065***	3.19	0.528***	5.29	0.350
MV1	-0.007	-0.32	0.137***	3.43	0.002	0.04	-0.115	-0.70	5.456***	10.31	0.601
MV2	-0.007	-0.58	0.089***	2.59	0.085***	3.74	-0.016	-0.24	3.899***	15.90	0.647
MV3	-0.031**	-2.35	0.128***	4.05	0.083***	5.76	0.085***	2.79	3.199***	24.05	0.758
BM1	-0.056***	-2.82	0.037**	2.13	0.085***	4.41	0.187***	3.90	3.630***	14.79	0.790
BM2	-0.021***	-3.92	0.210***	6.13	0.085***	5.83	0.130***	7.67	3.044***	15.86	0.570
BM3	0.020	0.71	0.620***	6.21	-0.011	-0.22	0.111**	2.47	4.276***	8.38	0.533
TV1	-0.034	-1.46	0.148***	2.88	-0.011	-0.16	0.167***	4.75	4.389***	6.91	0.445
TV2	-0.006	-0.25	0.107***	4.06	0.121***	5.24	0.154***	3.48	3.268***	14.45	0.736
TV3	-0.035**	-2.04	0.153***	5.18	0.043**	2.03	0.134***	3.49	4.177***	15.84	0.672
VO1	-0.039***	-3.71	0.059***	2.93	0.055***	3.22	0.118***	5.78	3.089***	15.84	0.766
VO2	0.009	0.47	0.034	1.39	0.095***	6.00	0.164***	3.54	3.303***	21.47	0.693
VO3	-0.068**	-2.24	0.295***	5.91	0.023	0.62	0.185***	3.97	5.406***	13.51	0.580

Panel B: Layoff ratio											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.017**	-1.87	0.135***	5.86	0.050**	2.18	0.157***	4.45	3.921***	15.28	0.633
U.S.	-0.034***	-2.89	0.103***	4.86	0.070***	4.82	0.183***	3.80	3.404***	17.58	0.770
U.K.	-0.020	-1.58	0.022	1.05	0.062**	2.55	0.165***	3.53	3.855***	12.06	0.679
Canada	0.003	0.12	0.595***	2.74	-0.096	-0.64	0.312**	2.60	6.708***	4.90	0.344
France	-0.017	-0.90	0.179***	2.87	0.051	1.01	0.115***	3.33	3.360***	7.92	0.545
Germany	0.048	1.62	0.223*	1.90	0.195***	3.78	0.074	1.47	2.850***	7.49	0.570
Japan	-0.020	-0.76	0.066	0.76	0.022	1.12	0.082	0.95	4.298***	25.43	0.724
Basic Materials	-0.017	-0.47	0.791***	3.85	-0.105	-0.84	0.222***	3.28	6.215***	5.15	0.312
Consumer Goods	-0.014	-0.57	0.034*	1.79	0.051**	2.17	0.098*	1.76	3.837***	17.68	0.610
Consumer Services	-0.045	-1.46	0.110**	2.38	0.126***	5.82	0.261***	4.62	4.130***	15.09	0.710
Financials	-0.013	-1.24	0.159***	3.29	0.025	1.60	0.063***	3.18	0.536***	5.58	0.606
Healthcare	-0.035	-1.50	0.260***	2.67	-0.040*	-1.86	0.073*	1.79	2.582***	10.75	0.435
Industrials	0.018	1.17	0.046*	1.95	0.073***	3.38	0.197***	4.21	3.039***	17.07	0.679
Oil & Gas	-0.102	-1.05	1.683***	5.27	0.239**	2.47	-0.143	-1.02	6.468***	5.92	0.592
Technology	-0.041**	-2.11	0.038*	1.84	0.098***	6.04	0.181***	3.31	2.656***	10.01	0.651
Telecommunications	-0.018	-1.08	-0.002	-0.08	0.036	0.87	0.080*	1.86	7.083***	12.33	0.760
Utilities	-0.010	-0.42	-0.068	-1.05	0.183***	2.84	0.391*	1.83	4.787***	6.80	0.348
MV1	-0.033	-1.39	0.156***	3.86	0.019	0.45	0.229***	4.27	4.705***	10.82	0.592
MV2	-0.002	-0.10	0.094***	2.63	0.087***	3.82	0.155***	4.22	3.584***	16.12	0.638
MV3	-0.014*	-1.86	0.131***	4.11	0.084***	5.85	0.091***	2.99	3.127***	25.69	0.758
BM1	-0.036*	-1.89	0.037**	2.13	0.085***	4.52	0.196***	3.85	3.564***	15.36	0.790
BM2	0.003	0.34	0.212***	6.10	0.086***	5.98	0.133***	7.69	2.991***	15.21	0.570
BM3	-0.016	-1.08	0.616***	6.28	-0.012	-0.25	0.107**	2.34	4.347***	8.80	0.534
TV1	-0.014	-0.73	0.149***	2.88	-0.011	-0.15	0.168***	4.71	4.359***	6.85	0.445
TV2	-0.010	-0.46	0.107***	4.02	0.120***	5.24	0.154***	3.49	3.272***	14.28	0.736
TV3	-0.026**	-2.38	0.154***	5.21	0.043**	2.04	0.139***	3.55	4.126***	16.42	0.672
VO1	-0.008***	-4.21	0.038***	6.09	0.029***	4.69	0.051***	5.44	3.480***	15.44	0.765
VO2	0.010	1.29	0.034	1.37	0.095***	6.05	0.164***	3.57	3.302***	21.65	0.693
VO3	-0.039***	-3.00	0.295***	5.86	0.023	0.65	0.188***	3.95	5.357***	13.62	0.580

Table VII: Rules and costs of redundancy by country

This table reports a summary of redundancy rules and costs for the six developed countries according to the World Bank Group. N/A indicates that data are unavailable.

	Canada	France	Germany	Japan	U.K.	U.S.
Panel A: Redundancy rules						
Maximum length of probationary period (months)	3	4	6	N/A	6	N/A
Dismissal due to redundancy allowed by law?	Yes	Yes	Yes	Yes	Yes	Yes
Third-party notification if one worker is dismissed?	No	No	Yes	No	No	No
Third-party approval if one worker is dismissed?	No	No	No	No	No	No
Third-party notification if nine workers are dismissed?	No	Yes	Yes	No	No	No
Third-party approval if nine workers are dismissed?	No	No	No	No	No	No
Retraining or reassignment obligation before redundancy?	No	Yes	Yes	Yes	No	No
Priority rules for redundancies?	No	Yes	Yes	No	No	No
Priority rules for reemployment?	No	Yes	No	No	No	No
Panel B: Redundancy costs						
Notice period for redundancy dismissal for a worker with 1 year of tenure	2	4.3	4	4.3	1	0
Notice period for redundancy dismissal for a worker with 5 years of tenure	5	8.7	8.7	4.3	5	0
Notice period for redundancy dismissal for a worker with 10 years of tenure	8	8.7	17.3	4.3	10	0
Notice period for redundancy dismissal (average for workers with 1, 5 and 10 years of tenure)	5	7.2	10	4.3	5.3	0
Severance pay for redundancy dismissal for a worker with 1 year of tenure	0	0.9	2.2	0	0	0
Severance pay for redundancy dismissal for a worker with 5 years of tenure	5	4.3	10.8	0	3.5	0
Severance pay for redundancy dismissal for a worker with 10 years of tenure	10	8.7	21.7	0	8.5	0
Severance pay for redundancy dismissal (average for workers with 1, 5 and 10 years of tenure)	5	4.6	11.6	0	4	0

Table VIII: Capital intensity by sector

This table reports estimates (our own computation) of capital intensity (CI) by each of the 10 sectors per country. Essentially, we scale total assets by total employment per firm. Firms with a higher value of total assets to total employment have higher CI. Panel A presents CI by sector for each country while Panel B provides a rank of CI for each sector within each country. The rank is from 1 (representing sector with the highest CI) to 10 (representing sector with the least CI).

Panel A: Capital per employee (US$ million per employee)							
	Global	US	UK	Canada	France	Germany	Japan
Basic Materials	5,168	1,802	22,346	4,759	2,260	9,915	4,617
Consumer Goods	5,598	1,447	2,413	1,000	5,686	22,875	11,104
Consumer Services	4,642	4,570	4,087	2,715	5,579	8,564	10,006
Financials	2,860	1,665	5,092	1,210	10,048	2,547	3,900
Healthcare	2,177	1,789	5,428	467	5,295	1,530	1,871
Industrials	2,755	1,953	951	3,604	6,503	4,910	5,964
Oil & Gas	19,463	5,887	86,960	19,231	36,864	540	NA
Technology	1,857	1,535	211	447	2,674	2,502	4,403
Telecommunications	18,785	15,545	19,814	9,555	34,434	56,403	NA
Utilities	12,287	5,736	17,180	3,342	10,489	47,621	NA
Panel B: Sector CI ranking							
	Global	US	UK	Canada	France	Germany	Japan
Basic Materials	5	6	2	3	10	4	4
Consumer Goods	4	10	8	8	6	3	1
Consumer Services	6	4	7	6	7	5	2
Financials	7	8	6	7	4	7	6
Healthcare	9	7	5	9	8	9	7
Industrials	8	5	9	4	5	6	3
Oil & Gas	1	2	1	1	1	10	NA
Technology	10	9	10	10	9	8	5
Telecommunications	2	1	3	2	2	1	NA
Utilities	3	3	4	5	3	2	NA

Table IX: Effect of layoff on corporate investment by capital intensity

This table reports the determinants of corporate investment based on regression (1). The only difference is in the panel formation. Instead of it been firms of each country (global) we divide each country's firms into high and low capital intensive (CI). CI is computed by scaling total assets with total employment of each firm. Those firms with CI in excess of mean sample CI are deemed as high-CI firms (High) while those with CI less than mean sample CI are deemed as low-CI firms (low). Panel A has regression results when layoff is proxied by natural log of the number of layoffs while panel B has results when layoff ratio is used as a proxy for layoffs. Panels I, II, and III represent different proxies for the dependent variable corporate investment. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Panel A: Layoff number									
	I: INV			II: INV1			III: INV2		
	Coefficient	t-statistic	$\bar{R}^2$	Coefficient	t-statistic	$\bar{R}^2$	Coefficient	t-statistic	$\bar{R}^2$
Global_Low	-0.036*	-1.84	0.698	-0.165**	-2.37	0.433	-0.842***	-3.88	0.089
Global _High	-0.020	-1.04	0.541	-0.028	-0.73	0.420	-0.593***	-3.06	0.076
U.S._Low	-0.029	-1.47	0.792	-0.118*	-1.93	0.600	-0.678***	-2.85	0.111
U.S._High	-0.036*	-1.75	0.712	-0.098*	-1.84	0.474	-0.579***	-4.23	0.109
U.K._Low	-0.062*	-1.95	0.628	-0.365**	-2.15	0.213	-1.291***	-3.86	0.024
U.K._High	-0.033	-1.56	0.702	-0.105**	-2.29	0.430	-0.840***	-2.63	0.076
Canada_Low	-0.035	-0.29	0.318	-0.169	-0.90	0.195	-0.730	-1.00	0.029
Canada_High	-0.063	-0.57	0.387	0.191	0.91	0.264	-0.424	-0.72	0.044
France_Low	0.027	0.88	0.393	0.038	0.37	0.547	-0.282	-0.68	0.091
France_High	-0.063**	-2.37	0.671	-0.146**	-2.23	0.393	-0.249	-0.89	0.148
Germany_Low	-0.071	-1.24	0.597	-0.282*	-1.69	0.457	-1.273***	-2.68	0.079
Germany_High	0.039	0.67	0.585	0.084	0.72	0.563	-0.316	-1.04	0.045
Japan_Low	0.026	0.93	0.788	-0.037	-0.42	0.358	-1.304***	-3.27	0.147
Japan_High	-0.008	-0.20	0.621	-0.002	-0.03	0.492	-1.243***	-3.62	0.121
Panel B: Layoff ratio									
	I: INV			II: INV1			III: INV2		
	Coefficient	t-statistic	$\bar{R}^2$	Coefficient	t-statistic	$\bar{R}^2$	Coefficient	t-statistic	$\bar{R}^2$
Global_Low	-0.030**	-2.25	0.699	-0.128**	-2.48	0.433	-0.630***	-4.59	0.092
Global _High	-0.006	-0.51	0.541	-0.041	-0.96	0.420	-0.259***	-2.82	0.069
U.S._Low	-0.044***	-3.76	0.792	-0.100*	-1.81	0.600	-0.805***	-4.27	0.123
U.S._High	-0.025	-1.61	0.711	-0.078**	-1.97	0.474	-0.362***	-3.79	0.105
U.K._Low	-0.044**	-2.13	0.629	-0.325**	-2.01	0.218	-1.034***	-4.18	0.037
U.K._High	-0.012	-0.79	0.702	-0.033	-1.21	0.428	-0.297**	-2.55	0.065
Canada_Low	0.001	0.02	0.318	-0.194**	-2.18	0.198	-0.169	-0.91	0.026
Canada_High	0.040	1.35	0.388	0.052	0.93	0.264	0.058	0.31	0.042

France_Low	0.096	0.62	0.393	0.342	1.01	0.549	0.164	0.18	0.090
France_High	-0.022	-1.15	0.668	0.014	0.31	0.385	-0.111	-1.01	0.146
Germany_Low	-0.033	-0.68	0.596	-0.157	-0.92	0.454	-0.698**	-2.19	0.069
Germany_High	0.082	1.49	0.588	0.159	1.58	0.566	0.199	0.85	0.041
Japan_Low	0.032***	2.79	0.790	0.008	0.19	0.358	-0.575***	-6.02	0.136
Japan_High	-0.090**	-2.45	0.628	-0.127***	-2.93	0.498	-0.973***	-2.86	0.101

Table X: Estimation results using alternative measure 1 of corporate investment

This table reports the regression results of corporate investment on layoff using panel fixed effect approach. The regression model takes the following form:

$$INV1_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * Q_{i,t-1} + \beta_3 * CF_{i,t} + \beta_4 * GDP_{i,t-1} + \varepsilon_{i,t}$$

The coefficient and its t-statistic are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Layoff number											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.089*	-1.84	0.294***	4.88	0.095***	3.59	0.402***	4.67	8.359***	19.36	0.434
U.S.	-0.107**	-2.17	0.263***	5.70	0.072*	1.79	0.504***	4.63	8.302***	14.51	0.578
U.K.	-0.177**	-2.33	0.041	1.11	0.067	1.34	0.416***	3.22	9.484***	11.96	0.254
Canada	-0.026	-0.19	1.020**	2.44	0.112	0.68	0.524**	2.39	8.713***	5.28	0.220
France	-0.083	-1.22	0.297**	2.31	0.234***	3.68	0.527**	2.41	7.753***	10.25	0.505
Germany	0.007	0.06	0.559***	2.68	0.243**	2.49	0.222*	1.91	6.696***	5.53	0.482
Japan	-0.032	-0.55	0.296*	1.84	0.111**	2.17	0.124	0.91	6.638***	12.97	0.399
Basic Materials	0.099	1.17	0.787***	2.89	0.099	0.73	0.355***	3.62	6.045***	5.09	0.260
Consumer Goods	-0.067	-0.80	0.124***	3.88	0.075	1.21	0.337***	3.20	8.611***	11.25	0.308
Consumer Services	-0.194***	-3.22	0.254**	2.47	0.177***	3.60	0.643***	3.84	8.325***	13.73	0.584
Financials	-0.305*	-1.81	0.480**	2.01	0.071	0.80	0.643***	3.49	9.618***	14.64	0.141
Healthcare	-0.284**	-2.28	0.520*	1.78	-0.300**	-2.08	0.248**	2.15	13.224***	7.09	0.333
Industrials	0.053	1.18	0.173	1.42	0.172***	4.62	0.411***	3.92	6.850***	15.67	0.514
Oil & Gas	-0.103	-0.64	2.645***	5.28	0.297**	2.54	-0.250	-1.52	4.505***	2.84	0.369
Technology	-0.229**	-1.91	0.340***	3.82	0.185***	3.77	0.445***	3.29	9.395***	10.83	0.457
Telecommunications	-0.002	-0.05	-0.018	-0.69	0.000	0.01	0.145***	3.55	7.475***	9.34	0.567
Utilities	0.087	1.20	0.109	1.62	-0.049	-0.81	-0.094	-1.21	7.275***	12.41	0.449
MV1	-0.110	-1.52	0.338***	3.83	0.086**	2.23	0.550***	3.92	8.329***	13.40	0.444
MV2	-0.075	-1.41	0.193***	3.90	0.108**	2.50	0.410***	5.64	8.160***	15.22	0.363
MV3	-0.101**	-2.25	0.312***	3.10	0.102**	2.04	0.236***	3.31	8.613***	16.43	0.497
BM1	-0.104***	-2.71	0.106***	2.89	0.070*	1.88	0.457***	9.58	9.252***	18.07	0.639
BM2	-0.064*	-1.83	0.552***	6.20	0.170***	4.56	0.361***	6.43	6.835***	17.90	0.353
BM3	-0.048	-0.61	1.120***	5.44	0.047	1.00	0.320***	2.75	7.713***	7.87	0.294
TV1	-0.066	-0.98	0.308***	4.00	0.120**	2.13	0.432***	4.32	7.691***	13.08	0.282
TV2	-0.086**	-2.27	0.203***	4.24	0.205***	4.13	0.453***	8.52	7.682***	14.87	0.598
TV3	-0.118**	-2.16	0.395***	4.64	-0.037	-0.50	0.316***	3.58	9.821***	10.04	0.398
VO1	-0.085**	-2.30	0.097***	2.63	0.027	1.24	0.304***	4.83	8.624***	26.55	0.505
VO2	-0.070	-1.04	0.114**	2.55	0.195***	4.38	0.453***	4.43	7.921***	15.67	0.392
VO3	-0.149**	-2.35	0.625***	4.38	0.053	1.60	0.451***	4.15	9.024***	17.76	0.443

Panel B: Layoff ratio											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.082**	-2.28	0.295***	4.82	0.093***	3.41	0.409***	4.66	8.311***	19.09	0.434
U.S.	-0.091**	-2.45	0.266***	5.64	0.069*	1.70	0.521***	4.54	8.205***	13.96	0.578
U.K.	-0.126**	-2.00	0.047	1.24	0.067	1.29	0.425***	3.16	9.358***	11.06	0.255
Canada	-0.079	-1.19	1.016**	2.48	0.106	0.63	0.525**	2.44	8.842***	5.30	0.221
France	0.035	0.84	0.287**	2.13	0.244***	3.96	0.517**	2.42	7.539***	10.89	0.504
Germany	0.093	1.00	0.579***	2.75	0.244**	2.55	0.213*	1.81	6.581***	5.88	0.483
Japan	-0.062	-1.34	0.297*	1.83	0.106**	2.11	0.122	0.88	6.686***	13.45	0.400
Basic Materials	0.002	0.03	0.780***	2.89	0.097	0.71	0.339***	3.27	6.246***	5.45	0.260
Consumer Goods	-0.098	-0.87	0.125***	3.82	0.074	1.19	0.339***	3.25	8.593***	11.88	0.309
Consumer Services	-0.133***	-2.70	0.262**	2.51	0.180***	3.56	0.661***	3.67	8.065***	12.64	0.583
Financials	-0.100	-1.63	0.501**	1.96	0.056	0.63	0.709***	3.60	9.276***	13.19	0.140
Healthcare	-0.177*	-1.72	0.558*	1.84	-0.300**	-2.10	0.269**	2.15	12.825***	7.26	0.333
Industrials	0.021	0.67	0.174	1.42	0.170***	4.49	0.405***	3.96	6.932***	15.51	0.514
Oil & Gas	-0.100	-0.65	2.650***	5.32	0.292**	2.49	-0.237	-1.38	4.505***	2.97	0.370
Technology	-0.190**	-2.25	0.325***	3.61	0.178***	3.56	0.456***	3.25	9.454***	10.70	0.461
Telecommunications	-0.037*	-1.68	-0.018	-0.69	0.002	0.03	0.145***	3.07	7.498***	9.30	0.568
Utilities	0.047	1.06	0.106	1.45	-0.003	-0.07	-0.063	-0.93	6.972***	17.13	0.455
MV1	-0.089	-1.60	0.339***	3.81	0.084**	2.16	0.556***	3.97	8.310***	13.60	0.445
MV2	-0.108**	-2.18	0.192***	3.93	0.104**	2.33	0.408***	5.54	8.204***	14.61	0.364
MV3	-0.040*	-1.69	0.321***	3.12	0.103**	2.08	0.258***	3.48	8.368***	17.15	0.496
BM1	-0.067**	-2.18	0.106***	2.93	0.071*	1.88	0.474***	10.10	9.126***	18.29	0.639
BM2	-0.038	-1.22	0.558***	6.29	0.170***	4.59	0.366***	6.32	6.758***	18.19	0.353
BM3	-0.119**	-2.41	1.116***	5.61	0.041	0.85	0.315***	2.63	7.825***	8.23	0.296
TV1	-0.030	-0.74	0.309***	3.97	0.120**	2.09	0.435***	4.27	7.638***	12.76	0.282
TV2	-0.126*	-1.93	0.201***	4.86	0.201***	3.74	0.451***	4.73	7.712***	11.91	0.599
TV3	-0.103*	-1.87	0.399***	4.69	-0.039	-0.51	0.334***	3.56	9.691***	9.84	0.398
VO1	-0.019	-0.81	0.102***	2.70	0.029	1.43	0.324***	4.74	8.423***	27.25	0.504
VO2	-0.011	-0.30	0.118***	2.60	0.197***	4.35	0.460***	4.45	7.796***	15.38	0.392
VO3	-0.150***	-3.85	0.622***	4.39	0.049	1.48	0.455***	4.25	9.036***	18.11	0.445

Table XI: Estimation results using alternative measure 2 of corporate investment

This table reports the regression results of corporate investment on layoff using panel fixed effect approach. The regression model takes the following form:

$$INV2_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * Q_{i,t-1} + \beta_3 * CF_{i,t} + \beta_4 * GDP_{i,t-1} + \varepsilon_{i,t}$$

The coefficient and its t-statistic are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Layoff number											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.701***	-3.55	0.353***	3.29	0.226***	2.97	0.194	0.53	3.553**	2.30	0.083
U.S.	-0.622***	-3.67	0.272***	2.57	0.097	1.07	0.368	0.85	4.495***	3.22	0.112
U.K.	-0.962***	-3.20	0.116	0.66	0.224	0.93	0.430	0.69	3.592	1.14	0.043
Canada	-0.574	-1.14	0.695**	2.40	0.402***	2.44	-0.494	-0.66	5.303	1.64	0.041
France	-0.324	-1.06	1.588**	2.40	0.532**	2.47	1.484*	1.65	-4.010	-1.11	0.104
Germany	-0.546*	-1.91	1.365	1.22	0.709***	4.32	0.299	0.57	-1.944	-0.51	0.070
Japan	-1.439***	-3.94	1.860**	2.34	0.444***	2.61	-0.829	-0.84	0.517	0.12	0.096
Basic Materials	-0.773*	-1.74	0.801	1.62	0.354**	2.07	-0.486	-1.18	4.455	1.60	0.074
Consumer Goods	-1.023***	-3.89	0.022	0.15	-0.050	-0.32	-0.003	-0.01	7.805***	3.91	0.046
Consumer Services	-0.548***	-2.74	0.064	0.38	0.215**	1.97	0.429	1.43	1.412	0.92	0.083
Financials	-0.474	-1.53	1.719*	1.90	-0.723***	-2.80	0.427	0.69	5.227	1.58	0.113
Healthcare	-0.327	-1.21	1.319***	3.05	0.254	1.63	-0.005	-0.03	1.669	0.57	0.062
Industrials	-0.666***	-3.28	0.322**	2.25	0.324**	2.37	0.605	1.15	1.683	0.83	0.056
Oil & Gas	-0.810*	-1.78	4.728***	3.08	0.966***	2.62	-1.043	-1.39	-10.332	-1.36	0.131
Technology	-0.789***	-3.52	0.608**	2.15	0.400***	3.90	-0.606	-1.00	2.055*	1.70	0.233
Telecommunications	-0.853***	-2.59	-0.860***	-2.97	-0.554	-0.92	0.197	0.24	14.009*	1.77	0.149
Utilities	-0.233	-0.63	1.003**	2.06	-0.408	-0.87	0.084	0.19	5.690	1.48	0.023
MV1	-1.105***	-3.82	0.422***	3.07	0.265**	1.98	0.351	0.76	1.778	0.84	0.072
MV2	-0.754***	-4.00	0.193	1.04	0.096	1.43	0.199	0.54	5.292***	4.80	0.073
MV3	-0.462**	-2.41	0.411***	3.22	0.266**	2.36	0.037	0.13	4.086***	2.59	0.106
BM1	-0.577***	-3.29	0.107	1.17	0.265***	3.05	0.219	0.95	2.643**	2.49	0.121
BM2	-0.727***	-3.66	0.534***	2.79	0.155**	2.45	0.299	0.89	3.834***	3.15	0.066
BM3	-0.724**	-2.49	1.761***	2.57	0.196	1.41	-0.036	-0.07	2.746	0.90	0.080
TV1	-0.728***	-3.08	0.230	1.30	0.290***	3.15	0.418	1.18	2.682	1.55	0.058
TV2	-0.605***	-3.54	0.379***	2.62	0.166	1.63	0.357	0.72	3.743***	2.73	0.059
TV3	-0.777***	-3.33	0.439***	4.73	0.232*	1.80	-0.187	-0.47	4.164*	1.83	0.134
VO1	-0.407**	-2.48	0.141	1.39	-0.204*	-1.74	0.353	1.25	7.676***	4.42	0.057
VO2	-0.688***	-3.33	0.183	1.05	0.181	1.35	0.220	0.57	4.604***	2.98	0.094
VO3	-1.052***	-3.66	0.725***	4.92	0.343***	2.98	0.040	0.09	2.29	1.10	0.100

Panel B: Layoff ratio											
	Layoff		Tobin-Q		Cash flow		GDP growth		Constant		$\bar{R}^2$
Global	-0.432***	-4.49	0.374***	3.58	0.229***	2.95	0.265	0.67	2.743**	2.00	0.080
U.S.	-0.575***	-4.04	0.292***	2.70	0.084	0.90	0.464	1.02	3.983***	3.06	0.115
U.K.	-0.506***	-3.96	0.159	0.94	0.241	0.99	0.525	0.83	2.415	0.75	0.042
Canada	-0.057	-0.43	0.649**	2.23	0.422***	2.59	-0.428	-0.55	4.544	1.53	0.037
France	-0.115	-0.86	1.566**	2.29	0.560***	2.70	1.444	1.59	-4.674	-1.51	0.100
Germany	-0.150	-0.79	1.402	1.22	0.723***	4.29	0.229	0.42	-2.859	-0.80	0.061
Japan	-0.864***	-6.04	2.023**	2.27	0.506***	2.67	-0.787	-0.77	-1.207	-0.27	0.077
Basic Materials	-0.361**	-2.22	0.858*	1.69	0.345*	1.95	-0.412	-0.91	3.674	1.45	0.073
Consumer Goods	-0.735***	-4.54	0.095	0.66	-0.020	-0.12	0.109	0.27	6.110***	2.76	0.035
Consumer Services	-0.740***	-3.50	0.078	0.46	0.212*	1.93	0.470	1.51	1.017	0.71	0.083
Financials	-0.299**	-2.40	1.829**	2.04	-0.742***	-2.93	0.450	0.69	4.647	1.58	0.116
Healthcare	-0.845**	-2.26	1.327***	3.42	0.261*	1.73	-0.105	-0.53	2.175	0.77	0.090
Industrials	-0.230	-1.63	0.318**	2.28	0.344***	2.62	0.692	1.22	0.602	0.32	0.048
Oil & Gas	-0.734*	-1.71	4.815***	3.21	0.939**	2.48	-0.937	-1.17	-10.780	-1.48	0.131
Technology	-0.443***	-2.83	0.571**	2.04	0.397***	3.79	-0.527	-0.84	1.539	1.24	0.233
Telecommunications	-0.416**	-2.24	-0.848***	-2.99	-0.626	-1.00	0.393	0.48	12.915	1.55	0.131
Utilities	-0.125	-0.68	0.983**	2.01	-0.415	-0.88	0.088	0.19	5.636	1.45	0.022
MV1	-0.612***	-3.98	0.426***	3.20	0.272**	2.03	0.409	0.82	1.103	0.59	0.073
MV2	-0.346***	-3.77	0.229	1.23	0.106	1.53	0.255	0.62	4.371***	3.45	0.066
MV3	-0.267***	-2.70	0.451***	3.68	0.269**	2.33	0.129	0.41	3.057**	2.09	0.101
BM1	-0.381***	-3.40	0.110	1.19	0.266***	3.07	0.314	1.18	1.962**	2.19	0.119
BM2	-0.399***	-3.60	0.605***	3.01	0.161**	2.47	0.353	0.95	2.822**	2.29	0.061
BM3	-0.471***	-3.14	1.827***	2.72	0.195	1.39	0.009	0.02	2.000	0.73	0.081
TV1	-0.335***	-3.79	0.244	1.35	0.291***	3.01	0.439	1.18	2.080	1.33	0.054
TV2	-0.284***	-4.45	0.402***	2.83	0.175*	1.70	0.423	0.81	2.953**	2.18	0.055
TV3	-0.621***	-3.97	0.468***	5.29	0.233*	1.87	-0.066	-0.15	3.060	1.55	0.138
VO1	-0.162	-1.38	0.166*	1.65	-0.194*	-1.69	0.441	1.39	6.801***	4.16	0.053
VO2	-0.357***	-4.02	0.223	1.28	0.176	1.23	0.283	0.68	3.767**	2.28	0.089
VO3	-0.572***	-4.37	0.717***	4.98	0.358***	3.15	0.086	0.19	1.427	0.76	0.099

Table XII: Estimation results using different global panel constructions

This table reports the regression results of corporate investment on layoff using panel fixed effect approach. The regression model takes the following form:

$$INV_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * Q_{i,t-1} + \beta_3 * CF_{i,t} + \beta_4 * GDP_{i,t-1} + \varepsilon_{i,t}$$

The coefficient and its t-statistic are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively. We form various sub-global panels by removing firms' of one country from the global panel at a time such that we have the following new panels; (i) global-U.S., (ii) global-U.K., (iii) global-Canada, (iv) global-France, (v) global-Germany, and (vi) global-Japan.

Panel A: Layoff number											
	Layoff		Q		CF		GDP		Constant		$\bar{R}^2$
Corporate investment (INV)											
Global-U.S.	-0.019	-0.85	0.185***	3.65	0.021	0.39	0.130***	3.48	4.575***	9.14	0.473
Global-U.K.	-0.026**	-2.11	0.169***	4.40	0.048	1.34	0.153***	8.27	3.925***	12.10	0.629
Global-Canada	-0.029*	-1.93	0.085***	4.19	0.074***	5.26	0.144***	4.27	3.589***	20.26	0.740
Global-France	-0.025**	-2.14	0.134***	4.37	0.050	1.57	0.156***	9.00	3.979***	13.40	0.634
Global-Germany	-0.028**	-2.51	0.134***	4.40	0.042	1.28	0.167***	8.87	4.000***	13.36	0.636
Global-Japan	-0.028**	-2.52	0.135***	4.40	0.052	1.58	0.167***	8.65	3.910***	12.59	0.630
Corporate investment alternative measure 1 (INV1)											
Global-U.S.	-0.050	-0.82	0.342***	3.22	0.130**	2.50	0.314***	3.39	8.320***	14.73	0.287
Global-U.K.	-0.079*	-1.79	0.369***	5.56	0.098***	3.84	0.399***	4.25	8.112***	19.87	0.459
Global-Canada	-0.106**	-2.24	0.215***	4.77	0.091**	2.45	0.395***	4.40	8.402***	15.93	0.512
Global-France	-0.090*	-1.89	0.293***	4.86	0.091***	3.40	0.397***	4.70	8.362***	19.50	0.432
Global-Germany	-0.093**	-2.05	0.290***	4.70	0.085***	3.37	0.427***	4.77	8.425***	20.44	0.432
Global-Japan	-0.093*	-1.80	0.292***	4.88	0.095***	3.48	0.450***	5.15	8.456***	18.05	0.431
Corporate investment alternative measure 2 (INV2)											
Global-U.S.	-0.762***	-3.06	0.489***	2.73	0.416***	3.68	0.070	0.18	2.148	0.90	0.055
Global-U.K.	-0.664***	-3.43	0.420***	3.86	0.225***	2.96	0.146	0.34	3.516**	2.22	0.091
Global-Canada	-0.714***	-3.78	0.315***	3.02	0.202***	2.75	0.247	0.68	3.545**	2.52	0.087
Global-France	-0.747***	-3.95	0.324***	3.15	0.214***	2.77	0.127	0.35	3.969***	2.73	0.084
Global-Germany	-0.718***	-3.70	0.342***	3.21	0.197**	2.49	0.178	0.42	3.863**	2.51	0.085
Global-Japan	-0.620***	-2.97	0.322***	2.93	0.212**	2.51	0.360	1.11	3.463**	2.17	0.085

Panel B: Layoff ratio											
	Layoff		Q		CF		GDP		Constant		$\bar{R}^2$
Corporate investment (INV)											
Global-U.S.	-0.005	-0.33	0.186***	3.00	0.022	0.32	0.131***	6.62	4.545***	8.27	0.473
Global-U.K.	-0.016*	-1.65	0.170***	7.00	0.048**	1.96	0.156***	4.20	3.897***	14.93	0.629
Global-Canada	-0.024***	-2.98	0.086***	3.73	0.074***	4.40	0.146***	8.74	3.563***	21.95	0.740
Global-France	-0.017*	-1.88	0.134***	4.38	0.050	1.57	0.159***	8.92	3.955***	13.45	0.634
Global-Germany	-0.020**	-2.24	0.134***	4.42	0.041	1.28	0.170***	8.81	3.973***	13.39	0.636
Global-Japan	-0.017*	-1.88	0.136***	4.42	0.052	1.57	0.171***	8.61	3.877***	12.58	0.630
Corporate investment alternative measure 1 (INV1)											
Global-U.S.	-0.071	-1.28	0.340***	2.91	0.127***	2.82	0.313***	6.48	8.348***	19.79	0.287
Global-U.K.	-0.073*	-1.86	0.370***	5.27	0.096***	3.54	0.406***	4.11	8.067***	18.98	0.459
Global-Canada	-0.084**	-2.16	0.219***	4.53	0.090**	2.26	0.404***	4.18	8.306***	14.88	0.512
Global-France	-0.087**	-2.31	0.295***	4.62	0.088***	3.05	0.404***	4.48	8.326***	18.26	0.432
Global-Germany	-0.088**	-2.36	0.292***	4.47	0.083***	3.02	0.436***	4.56	8.380***	18.99	0.433
Global-Japan	-0.084*	-2.13	0.293***	4.63	0.093***	3.18	0.457***	4.88	8.400***	17.10	0.431
Corporate investment alternative measure 2 (INV2)											
Global-U.S.	-0.321***	-3.66	0.501***	2.95	0.437***	3.89	0.092	0.23	1.165	0.54	0.049
Global-U.K.	-0.412***	-4.10	0.438***	4.02	0.226***	2.95	0.214	0.47	2.740*	1.93	0.088
Global-Canada	-0.535***	-5.17	0.342***	3.34	0.201***	2.62	0.311	0.80	2.808**	2.18	0.086
Global-France	-0.448***	-4.63	0.349***	3.45	0.216***	2.75	0.210	0.53	3.106**	2.36	0.081
Global-Germany	-0.447***	-4.55	0.363***	3.50	0.198**	2.47	0.269	0.59	3.029**	2.21	0.083
Global-Japan	-0.398***	-3.83	0.339***	3.16	0.211**	2.46	0.428	1.22	2.760**	1.99	0.084

Table XIII: Results from an augmented investment model

This table reports the regression results of corporate investment on layoff using panel fixed effect approach. The regression model takes the following form:

$$INV_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * GROWTH_{i,t-1} + \beta_3 * LEVERAGE_{i,t-1} + \beta_4 * CASH_{i,t-1} + \beta_5 * FIRMAGE_{i,t-1} + \beta_6 * SIZE_{i,t-1} + \beta_7 * GDP_{i,t} + \beta_8 * INV_{i,t-1} + \varepsilon_{i,t}$$

The coefficient of layoff variable and its t-statistic are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Layoff number			Layoff ratio		
	Coefficient	t-statistic	$\bar{R}^2$	Coefficient	t-statistic	$\bar{R}^2$
Global	-0.020**	-2.42	0.724	-0.013**	-2.41	0.724
U.S.	-0.053***	-7.06	0.841	-0.041***	-3.52	0.841
U.K.	-0.008	-0.44	0.751	-0.003	-0.35	0.751
Canada	0.052	0.93	0.488	0.029	1.43	0.488
France	-0.020	-0.86	0.565	-0.001	-0.08	0.565
Germany	0.013	0.36	0.686	0.032	1.32	0.686
Japan	-0.008	-0.35	0.814	-0.020*	-1.79	0.814
Basic Materials	-0.020	-0.40	0.434	-0.009	-0.35	0.434
Consumer Goods	0.002	0.10	0.704	0.006	0.32	0.704
Consumer Services	-0.026	-0.97	0.830	-0.032	-1.36	0.830
Financials	0.000	0.01	0.665	-0.009	-0.74	0.665
Healthcare	-0.025	-0.91	0.604	-0.027	-1.03	0.605
Industrials	-0.005	-0.33	0.793	0.006	0.73	0.793
Oil & Gas	-0.278***	-2.59	0.708	-0.217***	-3.39	0.708
Technology	-0.009	-0.35	0.722	-0.026	-1.41	0.723
Telecommunications	-0.036	-1.28	0.800	-0.049***	-2.70	0.803
Utilities	-0.011	-0.26	0.634	0.022	1.04	0.634
MV1	-0.012	-0.81	0.693	-0.006	-0.40	0.693
MV2	-0.030***	-3.29	0.722	-0.007	-0.60	0.721
MV3	-0.032***	-2.90	0.859	-0.030**	-2.34	0.859
BM1	-0.044**	-4.16	0.859	-0.023*	-1.80	0.859
BM2	-0.026***	-2.73	0.679	-0.006	-1.01	0.679
BM3	0.012	0.50	0.629	-0.008	-0.58	0.629
TV1	0.011	0.66	0.577	0.009	0.70	0.577
TV2	-0.037**	-2.44	0.831	-0.011	-0.72	0.831
TV3	-0.029**	-2.07	0.728	-0.029**	-2.49	0.729
VO1	-0.035***	-9.34	0.861	-0.015	-1.27	0.861
VO2	0.000	0.00	0.779	-0.002	-0.31	0.779
VO3	-0.043***	-3.32	0.681	-0.019***	-2.40	0.681

Table XIV: Estimation regression results with global financial crisis controlled

This table reports the regression results of corporate investment on layoff using panel fixed effect approach with global financial crisis controlled. The regression model takes the following form:

$$INV_{i,t} = \alpha + \beta_1 * LAYOFF_{i,t} + \beta_2 * Q_{i,t-1} + \beta_3 * CF_{i,t} + \beta_4 * GDP_{i,t-1} + \beta_5 * CRISIS + \varepsilon_{i,t}$$

Where the CRISIS is financial crisis dummy variable, which takes value of 1 if the year is 2007, 2008, or 2009 and 0 otherwise. The coefficient of layoff and crisis dummy variables and their t-statistics are reported. The regressions controls for the firm fixed effect and t-statistics are corrected for clustering of the residual at the firm level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Layoff number															
	INV					INV1					INV2				
	Layoff		Crisis		$\bar{R}^2$	Layoff		Crisis		$\bar{R}^2$	Layoff		Crisis		$\bar{R}^2$
Global	-0.036***	-2.89	0.375	1.34	0.633	-0.118***	-2.84	1.091*	1.92	0.436	-0.711***	-4.12	0.406	0.14	0.083
U.S.	-0.044***	-2.72	0.496*	1.67	0.772	-0.136***	-3.12	1.277**	2.06	0.581	-0.591***	-3.81	-1.401	-0.76	0.113
U.K.	-0.053***	-3.69	0.573**	2.49	0.682	-0.206***	-3.05	0.897**	2.29	0.255	-0.936***	-4.10	-0.920	-0.14	0.043
Canada	-0.068	-0.85	-0.724	-1.12	0.344	-0.008	-0.06	-1.292	-0.98	0.220	-0.611**	-2.18	3.666**	2.10	0.045
France	-0.044*	-1.74	0.125	1.05	0.546	-0.127**	-2.14	1.612**	2.52	0.515	-0.362	-1.30	1.560	0.34	0.104
Germany	0.007	0.20	0.509	1.22	0.571	-0.034	-0.34	2.007***	2.73	0.492	-0.607***	-3.06	3.166*	1.92	0.074
Japan	-0.028	-1.16	0.784***	3.37	0.736	-0.102**	-2.29	2.606***	4.28	0.441	-1.624***	-7.39	7.362***	5.19	0.136
Basic Materials	0.046	0.75	-0.283	-0.61	0.311	0.092	1.00	0.165	0.22	0.259	-0.919***	-3.44	3.478**	2.03	0.078
Consumer Goods	-0.026	-0.87	0.153	0.82	0.610	-0.073	-1.05	0.148	0.28	0.308	-1.008***	-4.83	-0.412	-0.16	0.046
Consumer Services	-0.075***	-2.95	0.440	1.20	0.710	-0.200***	-3.58	0.274	0.32	0.584	-0.532***	-3.36	-0.927	-0.23	0.083
Financials	-0.009	-1.08	0.082	0.76	0.605	-0.387**	-2.54	2.654**	2.08	0.147	-0.440	-1.45	-1.614	-0.63	0.114
Healthcare	-0.067***	-2.58	0.190	0.71	0.437	-0.299**	-2.42	1.076	1.09	0.334	-0.321	-1.24	-0.543	-0.28	0.061
Industrials	-0.012	-0.80	0.397***	3.83	0.682	0.007	0.17	1.515***	2.74	0.524	-0.720***	-5.41	1.806**	2.06	0.058
Oil & Gas	-0.132	-1.14	0.580	0.60	0.592	-0.173	-1.29	2.689***	5.97	0.394	-0.762*	-1.74	-2.166	-0.62	0.130
Technology	-0.051	-1.33	0.205	0.77	0.649	-0.274**	-2.37	1.848***	2.62	0.462	-0.733***	-2.98	-2.331	-0.82	0.234
Telecom	-0.051*	-1.76	0.205	1.08	0.649	-0.001	-0.03	0.268	0.55	0.565	-0.849**	-2.53	2.214	0.43	0.147
Utilities	0.085*	1.75	1.544***	3.28	0.428	0.092	1.35	1.650***	7.15	0.519	-0.225	-0.60	2.873**	2.02	0.029
MV1	-0.069**	-2.11	0.338**	1.99	0.592	-0.122*	-1.81	0.728	0.87	0.445	-1.100***	-4.04	-0.253	-0.06	0.072
MV2	-0.015	-0.97	0.443	1.58	0.640	-0.126***	-2.74	1.480***	3.02	0.368	-0.785***	-4.37	0.905	0.34	0.073
MV3	-0.040***	-3.89	0.371*	1.86	0.760	-0.129***	-3.42	1.099**	2.41	0.501	-0.473***	-2.79	0.438	0.21	0.106
BM1	-0.063***	-3.88	0.328***	3.12	0.791	-0.119**	-1.98	0.644	1.01	0.640	-0.564***	-3.42	-0.586	-0.22	0.121
BM2	-0.024***	-4.49	0.136	0.96	0.570	-0.077**	-2.47	0.538	1.33	0.354	-0.695***	-3.92	-1.275	-0.37	0.067
BM3	0.006	0.29	0.458***	2.79	0.534	-0.105	-1.46	1.777***	3.21	0.299	-0.796***	-6.72	2.449***	3.08	0.083
TV1	-0.034*	-1.65	-0.011	-0.04	0.445	-0.074	-1.28	0.279	0.40	0.282	-0.719***	-5.20	-0.370	-0.51	0.058

TV2	-0.019	-0.96	0.507	1.59	0.737	-0.127***	-2.81	1.583***	2.90	0.602	-0.609***	-4.70	0.171	0.25	0.058
TV3	-0.051***	-3.04	0.655**	2.28	0.675	-0.154***	-2.92	1.512***	2.75	0.403	-0.806***	-6.89	1.297**	2.06	0.135
VO1	-0.046***	-5.64	0.325**	2.08	0.768	-0.105***	-3.42	0.852***	2.71	0.509	-0.411***	-3.00	0.161	0.06	0.057
VO2	-0.001	-0.05	0.300	1.07	0.694	-0.107*	-1.84	1.121*	1.77	0.395	-0.691***	-3.96	0.090	0.03	0.094
VO3	-0.077***	-2.82	0.418	0.97	0.580	-0.174***	-2.94	1.120	1.39	0.445	-1.069***	-3.97	0.781	0.25	0.100
Panel B: Layoff ratio															
	INV					INV1					INV2				
	Layoff		Crisis		$\bar{R}^2$	Layoff		Crisis		$\bar{R}^2$	Layoff		Crisis		$\bar{R}^2$
Global	-0.022***	-2.62	0.365	1.28	0.633	-0.099***	-2.88	1.087*	1.87	0.436	-0.435***	-5.55	0.209	0.07	0.080
U.S.	-0.043***	-4.31	0.504*	1.71	0.772	-0.113***	-3.14	1.285**	2.04	0.582	-0.552***	-4.54	-1.330	-0.70	0.116
U.K.	-0.029**	-2.17	0.568**	2.52	0.682	-0.145**	-2.50	0.953**	2.50	0.257	-0.492***	-3.93	-1.008	-0.15	0.042
Canada	0.005	0.23	-0.753	-1.12	0.344	-0.073	-1.04	-1.243	-0.94	0.221	-0.069	-0.66	3.543**	2.02	0.041
France	-0.017	-0.89	0.082	0.80	0.544	0.026	0.57	1.454**	2.07	0.512	-0.121	-0.93	1.196	0.25	0.100
Germany	0.041	1.59	0.485	1.11	0.572	0.061	0.73	1.930**	2.44	0.492	-0.186	-1.03	2.706	0.55	0.064
Japan	-0.029	-1.30	0.780***	3.30	0.736	-0.100***	-2.82	2.589***	4.17	0.442	-0.943***	-5.65	6.685***	4.65	0.111
Basic Materials	-0.014	-0.37	-0.192	-0.41	0.311	-0.003	-0.05	0.294	0.42	0.259	-0.412***	-2.73	3.103*	1.83	0.076
Consumer Goods	-0.018	-0.87	0.141	0.71	0.610	-0.103	-1.02	0.183	0.37	0.309	-0.710***	-5.06	-0.847	-0.29	0.035
Consumer Services	-0.053*	-1.92	0.418	1.10	0.710	-0.137***	-3.18	0.212	0.24	0.583	-0.721***	-4.80	-0.965	-0.24	0.083
Financials	-0.014	-1.32	0.090	0.82	0.606	-0.126**	-2.22	2.596*	1.84	0.146	-0.288**	-2.33	-1.691	-0.62	0.117
Healthcare	-0.037*	-1.74	0.197	0.73	0.435	-0.190*	-1.95	1.131	1.15	0.334	-0.844**	-2.31	-0.102	-0.05	0.089
Industrials	0.011	0.70	0.378***	3.71	0.682	-0.009	-0.25	1.529***	2.82	0.524	-0.257**	-2.14	1.365*	1.88	0.049
Oil & Gas	-0.117	-1.14	0.604	0.62	0.592	-0.168	-1.35	2.734***	5.92	0.395	-0.694*	-1.67	-2.216	-0.62	0.130
Technology	-0.043**	-2.21	0.205	0.80	0.651	-0.206**	-2.39	1.820***	2.57	0.467	-0.420***	-2.77	-2.509	-0.86	0.235
Telecom	-0.017	-1.05	0.497***	3.42	0.765	-0.036	-1.63	0.264	0.54	0.567	-0.412**	-2.16	2.235	0.42	0.129
Utilities	0.056***	3.23	1.555***	3.38	0.427	0.093***	2.91	1.674***	6.83	0.526	-0.110	-0.60	2.856**	1.98	0.028
MV1	-0.036	-1.50	0.340	0.88	0.592	-0.097*	-1.83	0.763	0.91	0.445	-0.610***	-4.63	-0.195	-0.05	0.072
MV2	-0.009	-0.80	0.439	1.59	0.640	-0.135***	-3.08	1.510***	3.21	0.370	-0.356***	-3.61	0.542	0.19	0.066
MV3	-0.019***	-2.72	0.343	1.61	0.759	-0.057***	-2.57	1.005**	1.97	0.499	-0.268***	-3.19	0.111	0.05	0.100
BM1	-0.039**	-2.47	0.303***	2.91	0.790	-0.073	-1.51	0.596	0.91	0.640	-0.372***	-3.39	-0.787	-0.28	0.119
BM2	0.001	0.07	0.116	0.75	0.570	-0.047	-1.49	0.525	1.23	0.354	-0.374***	-4.82	-1.457	-0.41	0.063
BM3	-0.022	-1.49	0.492*	1.66	0.534	-0.149***	-3.20	1.868***	3.40	0.302	-0.501***	-3.96	2.230***	2.82	0.083
TV1	-0.014	-0.73	-0.023	-0.09	0.444	-0.034	-0.93	0.255	0.35	0.282	-0.327***	-4.52	-0.593	-0.12	0.054
TV2	-0.016	-0.89	0.504	1.59	0.737	-0.145**	-2.43	1.589***	2.92	0.604	-0.283***	-4.18	-0.071	-0.03	0.054
TV3	-0.036***	-3.16	0.646**	2.21	0.675	-0.129**	-2.36	1.522***	2.73	0.404	-0.636***	-5.19	1.179*	1.65	0.138
VO1	-0.009	-0.67	0.294*	1.75	0.767	-0.032	-1.21	0.791**	2.24	0.507	-0.161	-1.61	-0.074	-0.03	0.052

VO2	0.005	0.84	0.293	1.03	0.694	-0.029	-0.84	1.040	1.57	0.394	-0.354***	-6.04	-0.240	-0.07	0.089
VO3	-0.044***	-3.21	0.415**	2.28	0.580	-0.165***	-4.72	1.200	1.52	0.446	-0.581***	-4.66	0.734	0.22	0.099

Appendix A: Variables description

Variable	Description
INV	Corporate investment: calculated as capital expenditure scaled by total assets in previous year.
INV1	Corporate investment alternative measure 1: calculated as capital expenditure scaled by property, plant, and equipment of previous year.
INV2	Corporate investment alternative measure 2: calculated as the total asset growth rate
LAYOFF	The natural log of total number of announced layoffs by the company. This data captures the total number of employees that will lose their job owing to the announcement of layoffs by the company.
LAYOFF	The total number of announced layoffs by the company in year divided by the total number of employees
Q	Tobin Q: the ratio of the market value of assets to the book value of assets
CF	Cash flow: calculated as earnings before interest and taxes minus taxes and interest expense plus depreciation and amortization, scaled by total assets for each firm.
GDP	A country's GDP growth rate.
GROWTH	Sales growth rate, calculated as the change in sales scaled by sales previous year.
LEVERAGE	Firm leverage ratio, calculated as total debt scaled by total assets.
CASH	Cash holding: calculated as the current asset minus accounts receivable and inventory, scaled by total assets.
AGE	Natural log of firm age.
SIZE	The natural logarithm of firm total assets.