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ABSTRACT

This paper examines the impact of corporate financial distress on firms' ability to attract job applicants. Using novel, proprietary data from a leading online job search platform, we find that firms' financial health impacts job seekers' perceptions and behavior. First, using survey responses, we find that job seekers accurately perceive firms' financial health, as measured by the companies' credit default swap prices and other proxies. Second, we analyze responses to job postings by major financial firms during the recent financial crisis and find that these perceptions affect job seekers' application decisions. An increase in an employer's financial distress results in fewer applicants for job openings at the firm. We find fewer applications even when comparing applications to the exact same positions before and after entering distress. These effects are particularly evident in locations where the social safety net provides workers with weaker protections against unemployment and for positions requiring advanced training.

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1. Introduction

Financial decisions have far-reaching effects on a firm, including its ability to attract and retain human capital. A company's financial insecurity can lead current employees to search for more stable positions and new recruits to focus their searches elsewhere. Concerns about short-run solvency strain a distressed firm's reputation for treating employees fairly (Maksimovic and Titman 1991), and corporate financial distress often leads to significant job loss. Indeed, average employment decreases by 27 percent in the two years surrounding a bond default (Agrawal and Matsa 2012) and by 50 percent or more around a bankruptcy filing (Hotchkiss 1995).

Job loss can be extremely costly for workers—these workers may face substantial reductions in consumption during unemployment (Gruber 1997), limited opportunities to find new employment (Katz and Meyer 1990), and lower average wages at a new job (Gibbons and Katz 1991). Job insecurity and unemployment can also impose sizeable psychological costs (Sverke and Hellgren 2002). These losses are thought to be the greatest for workers with firm-specific skills. Given these costs, workers are likely to avoid distressed firms, making it difficult for these firms to recruit new talent, particularly for positions that require firm-specific investments. While such costs of distress feature prominently in theoretical explanations of firms' capital structure decisions (Titman 1984; Berk, Stanton, and Zechner 2010), their empirical relevance is less clear.

Empirical evidence is sparse in part because it is challenging to separately identify the effects of financial distress on the demand for and supply of labor. Distress often reduces a firm's scale and labor demand while also making the firm less attractive to workers and reducing labor supply. With data only on employment and wages, it is impossible to separate these channels empirically.

This paper exploits several novel datasets from a large online job search platform to overcome this identification challenge.[1] With micro data on job applications, we can hold demand fixed and examine how the supply of workers to specific jobs at individual firms is affected by firms' financial health. We study a period of economic crisis—early 2008 to early 2010—and focus on prominent firms in the financial services industry.

We first examine survey responses of job seekers on the online platform to assess job seekers' perceptions of firms' financial health. In surveys conducted between October 2008 and March 2010, thousands of respondents were asked to assess the financial health of potential employers on a five-point scale. In all, the surveys elicited perceptions of 145 firms. We match these firm-level assessments with indicators of financial strength, including daily credit default swap (CDS) prices. Consistently, we find that job seekers' perceptions are highly positively correlated with firms' true financial health.

Our second analysis examines whether applicants act on these perceptions. Job seekers can accurately gauge the financial stability of hiring firms, but do these perceptions affect their behavior? We exploit a second proprietary dataset that describes all of the jobs posted by 40 high-profile financial services firms to the job search platform between April 2008 and December 2009. Building on Holzer, Katz, and Krueger (1991), we examine the volume of applications to open positions as a measure of workers' demand for these jobs. We merge the application data with firms' CDS prices to assess the relationship between firm health and workers' willingness to apply.

Over the recent crisis period that we study, corporate financial health varied substantially both between financial firms and within-firms over time. Our identification strategy exploits

[1] A data use agreement restricts us from identifying the online platform.

these changes. The richness of the data allows us to develop a compelling counterfactual in our analysis. For example, we compare job seekers' interest in a given posting to their interest in other postings for the same type of job in the same geographic area and the same month, and we test whether the firm's credit default risk at the time of the posting affects the number of applications.[2] The detailed fixed effects rule out many possible alternative interpretations, such as unobserved local industry- and occupation-specific labor-market conditions.[3] We find that firms attract significantly fewer applications per job opening during periods of firm-level financial distress. On average, about 20 percent fewer job seekers apply to a given position for each 10-percentage point increase in the firm's probability of default (as indicated by its CDS price). The results are not driven by outlier observations and are robust to alternative specifications, such as using equity (rather than CDS) prices to capture changes in firms' financial health.

Additional analyses of potential mechanisms confirm that the decline in applications cannot be fully explained by shifts in labor demand. First, we consider the possibility that firms recruit for different positions during periods of distress; if the positions posted were more specialized, then the decline in observed applications could be attributable to there being a smaller pool of potential applicants. But to the contrary, when we control for the specific job title, the results remain negative and statistically significant. Second, we consider whether distressed firms attract fewer applicants because they are constrained to offer lower salaries. However, again to the contrary, we find that advertised salaries, if anything, increase during

[2] Of course, we are not suggesting that job seekers track individual firms' actual credit default prices over time. After establishing that job seekers' perceptions of firms' financial stability are correlated with credit default swap prices, we use these prices to proxy for firms' (actual and perceived) overall financial health.
[3] All of our analyses also control for firm fixed effects so that we are measuring only time-varying relative differences in the demand for positions at each employer.

periods of financial distress.

Furthermore, heterogeneity in the effect along two dimensions supports the interpretation that firms' financial distress affects labor supply—that is, holding other job- and labor market-specific characteristics fixed, a worker prefers to work for a firm that is in better financial health. First, we exploit state-level variation in unemployment insurance. More generous benefits reduce workers' costs of unemployment, and we find that workers are less sensitive to potential employers' financial distress in locations where unemployment costs are lessened by a stronger social safety net.

Second, we find that large upfront costs make job seekers reluctant to apply to distressed firms. Relocating to take a job is typically quite costly; in addition to the financial cost, relocating disrupts social and familial networks. If corporate distress reduces a firm's desirability as an employer, then we would expect the largest reductions among applications from workers who would need to relocate to start work. Consistent with a reduction in labor supply, we find that the proportion of job applications received from out-of-state applicants decreases by approximately 15 log points for a 10-percentage point increase in the probability of default.

A negative effect of corporate distress on labor supply has potential implications for distressed firms' human capital accumulation and retention. We find that the sensitivity of applications to distress is most pronounced for jobs with high educational requirements. Specifically, the number of applications to jobs requiring a four-year college degree is more sensitive to downturns in firms' economic stability than to jobs requiring a high school education or less. Similarly, jobs requiring a four-year college degree receive a lower proportion of applications from out of state when the employer is in distress. These results align with Topel (1991) and Topel and Ward's (1992) findings that the costs of unemployment are higher for

workers who have been in their jobs longer and that job tenure is positively correlated with education. Connolly and Gottchalk (2006) argue that highly educated workers bear particularly large unemployment costs because jobs that require substantial education also often require firm-specific investment by the employee. It is also possible that more highly educated workers are more attuned to changes in firms' financial health.

Although our application results apply directly to distressed firms' challenges in recruiting new employees, further evidence suggests that distressed firms also have trouble retaining their existing talent base. We find that distressed firms actively try to hire new employees despite large concomitant overall declines in employment, suggesting these firms experience relatively high employee turnover. Current workers are likely reluctant to stay with a distressed firm because of diminished job security and other outcomes of corporate distress.

Our analysis broadly supports the argument that firms suffered both directly and indirectly due to their financial distress during the recent credit crisis. Existing theories—and the empirical evidence presented in this paper—may explain, in part, why distressed firms struggle to regain financial stability. Indeed, a firm's distress appears to be reinforced by its inability to retain and attract skilled workers who could contribute to recovery.[4]

We provide direct empirical evidence that corporate financial distress affects a firms' ability to attract skilled workers. To avoid this distress, firms may create value by choosing more conservative financial policies. Agrawal and Matsa (2012) find that increases in legally mandated unemployment benefits, which reduce workers' exposure to unemployment risk, lead to increases in corporate leverage. Kim (2012) exploits new manufacturing plant openings to

[4] Although our empirical analysis focuses on the firm attracting new potential employees, firm characteristics that attract new workers are likely similar to those that encourage existing workers to remain with the firm.

argue that firms increase financial leverage when their workers have additional alternative job opportunities should the firm encounter distress. Our results are also consistent with evidence that firms pay compensating wage differentials for unemployment risk (Abowd and Ashenfelter 1981; Topel 1984; Li 1986; Hamermesh and Wolfe 1990). Other recent papers also integrate labor economics and finance and focus on the use of leverage as a strategic input in the bargaining process between workers and firms (e.g., Benmelech, Bergman, and Enriquez 2009; Matsa 2010; Chen, Kacperczyk, and Ortiz-Molina 2011).

Since Titman (1984), indirect costs have been used to rationalize the reluctance of firms to use debt financing despite large tax and other benefits of debt. In their classic study, Andrade and Kaplan (1998) analyze 31 highly leveraged transactions and estimate financial distress cost to be about 10 to 20 percent of firm value. But the exact sources of these costs remain unclear. In addition to the labor market effects examined in this paper, distress may affect real asset prices (Pulvino 1998), competitors' collateral values (Benmelech and Bergman 2011), and how firms compete in product markets, including entry (Chevalier 1995a), exit (Kovenock and Phillips 1997; Zingales 1998), pricing (Chevalier 1995b; Phillips 1995; Chevalier and Scharfstein 1996), and product quality (Rose 1990; Matsa 2011). Most recently, Hortascu, Matvos, Syverson, and Venkataraman (2011) find that prices for used automobiles respond to high-frequency fluctuations in manufacturers' distress.

In Section 2, we examine job seekers' self-reported perceptions of firms' financial health. In Section 3, we analyze the relationship between firms' financial success and the volume of applications attracted to open positions. In Section 4, we consider competing explanations for the relationship, and we explore potential implications of our results in Section 5. We conclude in Section 6.

2. Do job seekers accurately perceive firms' financial health?

To study the accuracy of job seekers' perceptions of companies' financial position, we analyze new data from a set of proprietary surveys. The 85 surveys were conducted by a large online job search platform between October 2008 and March 2010.

A typical survey asked respondents to consider four firms that are labor market competitors in a given industry. The questions asked job seekers to indicate their perception of firms' performance on several dimensions, including salary, training, reputation, and company financials. Answers were given on a 5-point scale, where "1" indicates a perception of very weak performance and "5" indicates a perception of very strong performance in a particular dimension. Respondents who were unsure (or, assumedly, unfamiliar with the firm in question) were asked to indicate "0" and their responses are excluded from the data used in our analysis.[5] Respondents' perceptions of a firm's financial health are summarized by average scores on the five-point scale. In the analysis that follows, we examine this average score at the firm-survey level.

To examine whether job seekers' perceptions of firms' financial health reflect companies' actual performance, we matched the survey responses to daily credit default swap (CDS) prices. CDS prices provide a measure of individual firms' financial health. CDS are financial contracts that pay off when a firm defaults on a specific existing loan or bond obligation. A firm's debt-holders may use CDS as protection against a bad financial event; however, unlike traditional insurance, CDS buyers need not hold any of the firm's *actual* debt. CDS prices are typically denoted in basis points and increase with the probability of default—

[5] On average, approximately 45% of respondents indicated that they were unsure about the firms' financial health. Although we do not observe individual job seekers' patterns of responses, the overall "unsure" rates were similar for questions about companies' reputation and higher for questions about corporate culture, compensation, and training.

that is, CDS prices are higher for riskier companies. Consider a simple example where the CDS price for a firm's debt is 150 basis points or 1.5 percent. An investor can buy $1 million worth of CDS protection from a large bank for $15,000 each period. If the firm were to default on its entire debt, then the bank would pay $1 million to the CDS buyer.

In broad terms, CDS prices reflect the likelihood that a firm falls into severe financial trouble. Unlike many other financial summary statistics that firms post once each quarter, CDS prices are available on a daily basis. Throughout our analysis, we use CDS prices, obtained from Bloomberg, that correspond to firms' senior 5-year bonds. We also compare survey respondents' assessments to quarterly accounting data from Compustat.

While we are restricted from identifying which specific firms are covered by the surveys, Panel A of Table 1 reports summary statistics. The surveys collectively cover 145 unique firms for which CDS price or Compustat data are available. Some firms are included in multiple surveys, yielding 194 total firm observations and 126 observations for which CDS prices are available. On average, about 150 survey responses underlie each firm observation. The average survey financial score is 3.3 on a five-point scale.

The surveys mostly cover large firms. Panel B of Table 1 describes the survey firms using data from the Compustat quarterly file for the first quarter of 2008 (prior to start of the surveys). The average market capitalization of a survey firm was $32 billion. The firms' average return on assets was 2 percent, sales growth 11 percent, and market-to-book ratio 1.65. Although the typical survey firm had modest financial leverage—total debt averaged 29 percent of book assets—a minority were highly leveraged with 17 percent having more than 50 percent leverage. Panel C of Table 1 reports the firms' distribution across industries. The two most represented industries are manufacturing and finance with about 30 firms each. Overall, the sample includes

large firms that performed moderately well during the previous quarter.

Figure 1 compares CDS prices to job seekers' average rating of the financial health of firms included in the survey.[6] Panel A presents results for all firms for which data were available. The figure is striking—when the CDS price is high, indicating that a firm is at higher risk of defaulting on its credit obligations, job seekers perceive the firm's weak financial position.

The recent economic crisis, which began in late 2007, provides us with an opportunity to study employment brand over a period when many firms were experiencing dramatic changes in their financial health. The rise and fall of firms in the financial industry received widespread attention—the health of both distressed and healthy financial services firms were likely particularly salient for job seekers in 2008 and 2009.

Thirty firms in the financial services industry (including banks, lenders, investment firms, and insurance companies) are among the firms covered in the surveys. Panel B of Figure 1 plots CDS prices and finance-related survey scores for the 18 of these firms for which CDS prices are available. Similar to the plot with all firms, job seekers' perceptions of firms' financial health appear to be associated with the firms' actual financial positions.

Both panels of Figure 1 suggest a clear link between job seekers' perceptions and firms' actual financial health. Regression analysis, controlling for several other factors that might influence survey scores, provides further evidence of the relationship. Table 2 reports these regression results; the top panel presents results for all firms in the survey for which CDS prices are available, and the bottom panel focuses on firms in the financial services industry. In various specifications, we include controls for firms' industries (using three-digit NAICS codes) and

[6] To conceal firms' identities, Figures 1 and 2 only includes firms with CDS prices below 1000 basis points. The regression analyses include all firm observations.

survey quarter fixed effects.

In all of the regressions, the coefficient on the CDS price variable is negative and statistically significant ($p < 0.01$). In general, a one-standard deviation increase in CDS prices reduces the average survey score by 0.17 (approximately 0.40 of a standard deviation). While job seekers' are unlikely to be tracking CDS prices in a literal sense, our results suggest that their perceptions accurately reflect the overall health of individual firms.

In addition to CDS prices, other financial measures also provide compelling evidence that job seekers perceive differences in firms' health. Using quarterly financial data from S&P's Compustat, we generate several variables to represent aspects of companies' financial strengths or weaknesses: quarterly return on assets reflects a firm's current profitability; sales growth (over last year, same quarter) reflects a firm's past performance; and the market-to-book ratio reflects a firm's future prospects.

Because recent performance is likely the most salient for job seekers, we examine the conditional correlation of the mean survey response and a firm's performance in the previous quarter. Table 3 reports results from several robustness checks, for all firms and for the subsample of firms in the financial services industry. Again, our results suggest that job seekers' perceptions of firms' financials are highly correlated with firms' actual performances.

Panel A of Table 3 reports results for the full sample. Results in column 3.A find that a one-standard deviation increase in quarterly return on assets is associated with an increase in the average survey score of 0.1 (approximately 0.13 of a standard deviation; $p < 0.01$). Similarly, one-standard deviation increases in sales growth (column 3.B) or the market-to-book ratio (column 3.C) are also linked to 0.1 point higher survey scores ($p < 0.10$ and $p < 0.01$, respectively). In Panel B of Table 3, we restrict the survey sample to ratings of financial services

firms. Among these firms, a one-standard deviation increase in quarterly return on assets is associated with a 0.4 point improvement in the survey score (nearly 0.9 of a standard deviation; $p < 0.01$; column 3.D). As reported in columns 3.E and 3.F, a one-standard deviation increase in sales growth or the market-to-book ratio is associated with an improvement of approximately 0.1 and 0.2 survey points (approximately 0.25 and 0.50 of a standard deviation; $p < 0.05$ and $p < 0.01$, respectively).[7] Overall, the robustness checks in Table 3 provide further evidence that job seekers' assessments reflect firms' actual financial health.[8]

3. Does firms' financial health affect job seekers' application behavior?

The surveys analyzed above suggest that job seekers' perceptions are attuned to firms' financial health. But do these perceptions affect the firms' appeal to potential applicants? We next examine how employers' financial health affects job seekers' choices of where to submit applications. That is, do distressed firms attract fewer applications to open positions?

Our analysis focuses on firms in the financial services industry during the volatile months between April 2008 and December 2009. Variation over this time period allows us to identify the relationship between firms' financial health and their search for employees. Figure 2 presents daily CDS prices for 99 financial services firms from 2008 to 2010.[9] The solid line represents the median CDS price, while the dashed lines represent the 25th and 75th percentile prices, respectively. Some firms fared relatively well over this period—the 25th percentile of the CDS price appears relatively stable over time. As suggested by the dramatic change in the 75th

[7] For the sample of financial services firms, the standard deviation is 1.56 percent for return on assets, 20.28 percent for sales growth, and 0.79 for market-to-book ratio.

[8] The magnitude and statistical significance of the results in Tables 2 and 3 are very similar when the regression coefficients are weighted by the number of survey respondents.

[9] These 99 firms are all of the firms in the financial sector with total assets greater than $25 billion for which CDS prices are available.

percentile CDS price, however, other firms suffer near collapse.

This variation is a key component of our identification strategy. If we only had a single cross-section, we would be unable to distinguish whether differences in the volume of applications were attributable to the company's financial health or to some other stable firm characteristic. Our panel allows us to overcome this challenge—using variation over time and across firms, we can capture the impact of individual firms' distress on job seekers' behavior while controlling for other firm-, time-, location-, and job-specific effects.

In the analysis that follows, we restrict our sample to the 40 large financial firms with total assets exceeding $25 billion for which both job applications data and CDS prices are available. The job listing and application data are from the same large online job-search platform. This proprietary dataset includes job postings for some of the highest-profile financial services firms in the U.S.—indeed, most of the firms are household names.

The platform allows firms to post job listings and job seekers to apply to these positions through the platform's user interface.[10] All job listings include firm identity, job title, and location information. Firms may also elect to describe the job tasks, educational requirements, compensation, and other benefits. Job seekers can browse job categories—filtering by location, educational requirements, and job characteristics—or search the platform using keywords. Search results can be sorted according to various job characteristics, including location and firm name.

Summary statistics are reported in Table 4. The sample includes data for 96,065 unique jobs posted by the 40 firms between April 2008 and December 2009. On average, a firm posted approximately 2,400 jobs during this 91-week period; the median firm posted roughly 660 jobs.

[10] The platform is supported by revenue from companies posting positions and from advertising. Job seekers use the platform for free.

Applications are thick—over the study period, an average firm attracted 138,646 applications and the average job posting received 57.7 unique applications (median 28).[11]

We collected daily CDS prices for the 40 firms of interest. Over the 10,110 firm-days on which jobs were posted, CDS prices averaged $279 for $10,000 of protection (median $174). As shown in Figure 2, however, CDS prices varied considerably both within and between firms over the study period. An average firm posted jobs in 70 percent of the weeks in the period of study; conditional on posting any job in a given week, firms averaged nearly 38 listings per week (median 14).

Figure 3 plots the total number of jobs posted each month by the 40 firms of interest and these firms' median CDS price. There is a marked decline in job postings from the end of 2008 to mid-2009, the time period over which CDS prices were high for many of the firms in our sample. In the analysis that follows, we control for these aggregate patterns using month fixed effects.

To explore the impact of financial distress on firms' appeal to workers, we examine the relationship between firms' default risk and the volume of applications that they attract. The unit of analysis is a unique job posting and the dependent variable is the natural log of the number of applicants. Because job postings are typically open to potential applicants for 30 days, we use the monthly average CDS price for individual firms. For ease of interpretation, the CDS price variable is denoted as the price to purchase $1 of default protection, such that the price effectively represents the probability of default when the recovery rate is zero. Standard errors are clustered at the firm level to account for correlation across jobs posted by the same company.

[11] We do not observe job postings for which no one applied. If firms' financial distress decreases the number of application (as our later analysis suggests), then missing these observations may lead us to understate this relationship.

Table 5 presents results from baseline regressions that use various sets of controls. The specification reported in column 5.A controls for firm and month fixed effects. The firm fixed effects account for any fixed differences between firms such as industry, year of incorporation, and broad market positioning. The month fixed effects account for the changing aggregate economic conditions during the financial crisis; for example, the effects sweep out the aggregate patterns illustrated in Figure 3. The results suggest that a $0.10 increase in the price of $1 of CDS protection is associated with a nearly 20 log point decline in the number of applications per posting ($p < 0.05$). To account for geographic variation in job opportunities and changes across states over time, columns 5.B includes state fixed effects and column 5.C includes a separate state fixed effect for every month in the sample period. These coefficients are similar and suggest that a $0.10 increase in the price of CDS protection is associated with a 17 to 18 log point drop in applications ($p < 0.05$ and $p < 0.01$, respectively).

Even with the detailed firm and state-month controls, it is possible that there is variation over time in the characteristics of the jobs posted by a given firm. This could bias the results if any changes in job characteristics were correlated with CDS prices. For example, administrative and clerical jobs always tend to receive more applications than accounting jobs; perhaps distressed firms are relatively more likely to post accounting jobs when CDS prices deteriorate? To evaluate this possibility, we exploit a classification provided by the online platform. Posted jobs are assigned up to four of 19 job types.[12] Examples of job types include administrative and clerical, sales, professional services, finance, and customer service.

Column 5.D presents results that include indicator variables for each of the 19 classification codes. The coefficient on CDS price is virtually unchanged—a $0.10 increase in

[12] The classification includes 18 named categories. Any job type represented in less than 2 percent of job postings was coded as the 19th category, "Other."

the CDS price is associated with a 17 log point decline in applications ($p < 0.01$). In specification 5.E, we allow for even finer heterogeneity in job types by including the interactions between job classifications for positions that fall into multiple job categories. For example, we separately control for customer service jobs in banking and customer service jobs in insurance. In total, this amounts to 679 unique detailed job classifications. The coefficient on CDS price is again negative and statistically significant—a $0.10 increase in the CDS price is associated with a 13 log point decline in applications ($p < 0.01$).

In a final specification, we allow the impact of these 679 detailed job types to vary by state-month. With these additional interactions, the specification identifies the relationship between CDS price and the volume of applications within a given detailed job type in a given state during a single month. The estimated coefficient on CDS price is again statistically significant and suggests that a $0.10 increase in the price of $1 of CDS protection is associated with a nearly 24 log point decrease in the number of applicants ($p < 0.01$).

These results appear to be quite robust. In columns 6.A and 6.B of Table 6, we present analyses that assess the role of outliers by winsorizing the application and CDS data at the 1 and 5 percent tails, respectively. The resulting estimates are negative, statistically significant, and even larger in magnitude than those reported in Table 5. If anything, outliers mute the relationship between CDS price and job seekers' applications. After winsorizing and controlling for firm and detailed job type-state-month fixed effects, a $0.10 increase in the CDS price is associated with approximately a 55 to 60 log point decline in the number of applications ($p < 0.05$).

We also examine an alternative functional form. In column 6.C, we model a linear relationship between CDS price and the volume of applications. We again find a negative and

statistically significant relationship. A $0.10 increase in the CDS price is associated with about 5 fewer applicants per open position ($p < 0.05$)—a decrease of approximately 9 percent, relative to the mean.[13]

We also consider firms' stock prices as an alternative high-frequency measure of firm performance. Although both CDS and equity prices should reflect all available information about firms' prospects and risks of default, these factors will manifest in the prices differently.[14] CDS prices most directly reflect the probability of a credit event, in the case of our study, for the firms' 5-year senior corporate bonds. A credit event is undoubtedly bad for potential employees, but poor corporate performance can lead to layoffs and impose other costs on workers even when the firm does not default on its debt. Such nondefaulting underperformance may more likely be reflected in firms' equity market value, although equity values reflect many other factors as well.

Naturally, we expect any relationship between CDS and stock prices to be negative—increases in a firm's default risk should be reflected in higher CDS prices and lower stock prices. Thus, we expect the relationship between stock price and the volume of applications to be positive. In Column 6.D, we estimate the impact of a percentage change in firms' stock prices. Controlling for firm fixed effects and detailed job type-state-month interactions, the estimates suggest that a 10 percent decrease in the stock price is associated with a 2 percent decrease in the number of applicants per job posting ($p < 0.01$).

[13] Given the high variability in the number of applications per position (see Table 4), we measure application counts in logs in the main specifications.

[14] Studies of the relationship between the stock and CDS markets show mixed results. Longstaff et al. (2003) do not find evidence of a strong relationship between stock and CDS prices; however, Norden and Weber (2009) and Forte and Pena (2009) find that daily stock prices lead CDS price changes for many international firms. Fung et al. (2008) find that the lead-or-lag relationship depends on a firm's credit quality—high-yield CDS indices tend to lead the stock market prices, while investment-grade CDS indices do not. They also study volatility and find evidence that both investment-grade and high-yield CDS indices lead stock market volatility.

4. Why do applications decrease?

Sections 2 and 3 present evidence that job seekers both perceive and respond to changes in firms' financial health. While these empirical findings are valuable in their own right, they also prompt us to ask "Why?" In this section, we consider competing explanations for the relationship and conclude that reductions in labor supply at distressed firms play a role.

4.A Labor demand

Although our main analysis has focused on job seekers' decisions, we consider the possibility that changes in firms' labor demand underlie the applicants' behavior. We evaluate two potential demand-side explanations: (1) firms' hiring needs become more specialized during periods of distress and (2) financial health constrains firms' ability to compensate workers.

Firms' human capital needs may change during periods of financial distress. For example, a distressed commercial bank may be more focused on servicing existing loans than on originating new loans. As a result, hiring may shift from loan officers to collection specialists. To the extent that distressed firms recruit for specialized positions, the decline in observed applications may be attributable to a smaller pool of potential applicants rather than to workers having reduced interest in these firms. If distress shifts hiring across job classifications—for example, from marketing to accounting—then these effects would be captured by the detailed job type controls in Section 3. However, these controls would not account for hiring changes *within* a given job classification towards positions with smaller baseline applicant pools.

To evaluate this possibility, we analyze changes in the volume of applications for particular jobs. Every job posting in the dataset includes a specific job title—for example, "Agricultural Loan Officer." Across all firms, the data include nearly 33,800 unique job titles. In

the analysis presented in column 7.A of Table 7, we augment our baseline specification with fixed effects for each job title. The analyses reported in columns 7.B and 7.C include even more demanding controls, capturing fixed effects for each individual job title in each firm and for each job title within each firm in each state, respectively. In all of these specifications, the coefficient is negative and statistically significant—a $0.10 increase in the CDS price is associated with a 9.6 to 11.1 log point decrease in applications. Together, these estimates suggest that the main result—that firms' financial distress is associated with a lower volume of applicants—is not being driven by changes in the human capital needs of distressed organizations.

Even if firms' human capital needs are not changing, financial distress may constrain their ability to hire. If applicants dislike working for distressed firms, then firms may need to offer higher salaries to attract the same number of applicants. But distressed firms may not have the resources to increase (or even maintain) their salary offers to new employees. In this case, we might observe fewer applications because of lower salaries, not because of increased layoff risk or other labor supply considerations.

To investigate this potential demand-side explanation, we examine how salaries change when firms experience financial distress. Salary information was included in 6,391 of the job postings; we do not observe salaries for other positions. The median annual base salary is $52,500, with an interquartile range of $32,500 to $97,500.[15]

Columns 7.D, 7.E, and 7.F of Table 7 present regression results using the natural log of the average salary as the dependent variable. To focus on salary changes for specific jobs, we again include job title, firm, and state fixed effects and their interactions. The estimates suggest

[15] The salary information provided is coded into categories of $5,000 increments for salaries up to $100,000 and $25,000 increments for salaries between $100,000 and $500,000. In our analysis, we use the mid-point of each category and recode salaries above $500,000 to $650,000. The results reported in Table 7 are robust to using alternative recoding values or to excluding job postings with salaries over $500,000.

that, if anything, firms offer higher salaries to attract applicants during periods of distress. A $0.10 increase in the CDS price is associated with a 16 to 18 log point increase in salary. These estimates are somewhat less precise, which is expected given the small sample size. The increase in salaries is consistent with the literature on compensating differentials for unemployment risk (Abowd and Ashenfelter 1981; Topel 1984; Hamermesh and Wolfe 1990).

Overall, we find no evidence that changes in labor demand can fully explain our results.

4.B Labor supply

Another possibility is that corporate financial distress affects labor supply—when offered similar positions and the same wage, a worker may prefer to work for a firm in better financial health. Distress reduces job security (Hotchkiss 1995; Agrawal and Matsa 2012), which imposes both psychological (Sverke and Hellgren 2002) and economic costs (Maksimovic and Titman 1991), even for workers who remain with the firm. The costs of unemployment are even more substantial (Katz and Meyer 1990; Gibbons and Katz 1991; Gruber 1997). Given all of these costs, job seekers may avoid distressed firms, making it difficult for these firms to recruit new workers.

We explore the role of labor supply in two ways. First, we exploit state-level variation in the unemployment insurance (UI) system. Although the basic structure of UI is common throughout the United States, there are substantial differences between states in the generosity of benefits. In every state, eligible claimants receive weekly benefits payments for a set number of weeks, based on their employment histories. Following Agrawal and Matsa (2012), we measure the generosity of states' UI systems using the product of the maximum benefit amount and the

maximum duration.[16] We use states' maximum UI benefits in January 2009, which averaged $11,500 (standard deviation $3,600).

More generous UI benefits reduce workers' costs of unemployment. To the extent that job seekers' behavior is influenced by concerns about job security, more generous UI benefits may mitigate these concerns and make workers' less sensitive to firms' financial distress. Empirically, this would reduce the sensitivity of the volume of applications to CDS prices. In analysis reported in Table 8, we interact CDS price with the log maximum UI benefit in the state where the job is located. To ease interpretation of the CSD main effect, the sample mean is removed from the log maximum UI benefits prior to the interaction.

We find that workers are more willing to apply to positions at distressed firms in states where unemployment costs are lessened by a stronger social safety net during unemployment. Column 8.A presents results from the baseline specification with firm and month fixed effects. While a $0.10 increase in the CDS price is associated with a 19 log point decline in the number of applications in a state with average maximum UI benefits, this sensitivity is 7 log points lower for states with 25 percent higher UI benefits ($p < 0.05$). This relationship is robust to the various specifications. As we control for more detailed labor market variation, the point estimates increase in magnitude. Results from our most demanding specification—analysis with firm and detailed job type-state-month fixed effects—are presented in column 8.F. Here, a 25 percent increase in maximum UI benefits cuts the sensitivity of applications to CDS prices in half—from

[16] While ideally we would focus on individual job-level variation in the ratio of the UI benefit to wages, the limited availability of wage data precludes us from adopting this approach. Instead, we exploit state-level differences in UI systems using maximum benefit levels—the primary source of cross-state variation in UI generosity (Moffitt and Nicholson 1982). As an additional test, we exploit variation based on the positions' educational requirements as a proxy for workers' income and liquid savings (see footnote 17).

22 to 11 log points ($p < 0.01$).[17]

Taking a job also involves upfront costs. To further explore the role of labor supply, we examine whether large upfront costs make job seekers reluctant to apply to distressed firms. Specifically, we study the role of relocation costs. When a prospective employer's financial future is uncertain, the desirability of open positions may be particularly weak for workers who have to relocate for the job. These job seekers may be reluctant to make substantial upfront investment for jobs whose long-run prospects are uncertain.

To examine this mechanism empirically, we limit our sample to job postings where we observe at least 80 percent of the applicants' state of residence. For these jobs, 23 percent of applicants live outside of the state in which the job is located; many of these applicants would likely have to relocate if they took the position. In Table 9, we analyze the percentage of applications from out of state. The regressions are weighted by the number of applications received to account for differences in the precision of the out-of-state measure.

We find that financial distress decreases the proportion of applications from out of state. The coefficient on CDS price is negative and sizable. When controlling only for firm and month fixed effects, the coefficient estimate is large but imprecise (Column 9.A). Adding more detailed job market controls reduces the standard error dramatically. With controls for firm and detailed job type-state-month, the estimate is significant at the 1 percent level. A \$0.10 increase in the price of \$1 of CDS protection is associated with a 1.7 percentage point decrease in the proportion

[17]As a further test, we split the sample by jobs' educational requirements. Individuals with more liquid savings, such as the college educated, are likely to be less sensitive to marginal differences in UI generosity (Chetty 2008). Consistent with this, the interaction between CDS price and UI benefits is stronger for jobs with lower educational requirements. In an analysis with firm and detailed job type-state-month fixed effects, a 25 percent increase in the maximum UI benefit lowers the sensitivity of the number of applications to changes in CDS prices by 25 log points (s.e. 10) for jobs requiring only high school and 7 log points (s.e. 8) for jobs requiring a college degree.

of out-of-state applicants (column 9.F). Relative to the sample mean, this effect represents a 14 percent decrease in the proportion of out-of-state applicants.

The reduction in out-of-state applications has strategic implications for distressed firms. Out-of-state applicants are particularly valuable to firms when local workers lack the skills required for open positions. Distress appears to constrain firms' ability to attract workers from the national labor market, potentially preventing them from hiring workers with the appropriate skills. This challenge in accumulating human capital may contribute to distressed firms' struggles to regain financial stability.

Together, the results exploiting variation in unemployment costs and relocation costs suggest that workers' labor supply indeed responds to firms' financial health. We conclude that the decrease in job applications to distressed firms at least partially reflects worker preferences, not strictly changes to firms' labor demand.

5. Potential implications for firms' human capital

The negative effect of corporate distress on labor supply has potential implications for distressed firms' human capital accumulation and retention. While a full analysis of these issues is beyond the scope of our data, further analysis provides some indication of which positions are most affected by firm distress and whether current employees' labor supply is also affected.

5.A Heterogeneous effects of distress and firms' human capital acquisition

Distress may not affect hiring for all positions equally—the volume of applications for some positions may be more sensitive to distress than others. Workers who suffer most from being laid off are likely especially sensitive to job insecurity—these workers include, for

example, people whose specific skills make it difficult to find a good match, jobs that require firm-specific investments, and positions with steep wage-tenure profiles. Workers may also differ in their awareness of employers' financial health.

Irrespective of the underlying mechanisms, describing cross-worker heterogeneity in responsiveness to corporate distress can shed light on what types of human capital are most sensitive to firms' financial health. To this end, we divide job postings by educational requirements. Data on educational requirements are available for approximately 40 percent of the job postings. Of these, approximately 65 percent require a four-year college degree and 35 percent require only high school.

Columns 10.A and 10.B of Table 10 report results of an analysis of the volume of applications to jobs requiring at most a high school education and to jobs requiring at least a 4-year college degree, respectively. To save space, we report only specifications with firm, state-year, and job category fixed effects; specifications that also include detailed job type-state-month fixed effects yield estimates that are less precise.[18] For lower-education jobs, the estimated coefficient for CDS price is negative, but small in magnitude and not statistically significant at conventional levels. In contrast, the coefficient estimate on the CDS price is negative and statistically significant for jobs requiring a college education. A \$0.10 increase in the CDS price is associated with a 21 log point decline in applications to jobs requiring college ($p < 0.10$). The relative size of the coefficients in Table 10 suggests that the effect identified in Table 5 mostly reflects the sensitivity of applicants pursuing jobs with high educational requirements.

We propose two possible explanations for these results—highly educated workers either

[18] With the additional controls, the coefficient estimate reported in column 10.B becomes -2.58 (s.e. 1.31) and the coefficient estimate in column 10.D becomes -29.51 (s.e. 22.72). The estimates reported in columns 10.A and 10.C remain not statistically significiant.

may be more knowledgeable about firms' financial condition and/or they may expect to suffer greater costs in the case of corporate distress. Highly educated workers likely bear greater expected distress costs, in part, because of their steeper wage-tenure profiles (e.g., Connolly and Gottchalk 2006). Expected total job tenure also increases with education, further magnifying potential losses in corporate distress (Topel 1991; Topel and Ward 1992).

Multiple underlying models can explain the differential wage-tenure profiles. First, the firms could be using deferred compensation, whereby firms pay senior employees more than their marginal product and junior employees less, to motivate workers early in their tenure (Lazear 1979). Such schemes rely on the continued solvency of the firm. If jobs requiring more education are also ones with established "career paths" and steep seniority-wage profiles, then workers qualified for those positions may be reluctant to apply when the firm's future is uncertain. Second, the differential wage-tenure profiles may be supported by specialized investments in human capital. Applicants seeking jobs that require greater investment in firm-specific human capital face higher unemployment costs. Uncertainty over the future health of the firm also makes such investment unattractive to new employees. Consequently, investment in human capital declines when workers face possible separation from the firm (Jovanovic 1979).

More educated job seekers may also be more informed about, and therefore more sensitive to, firms' financial health. In our empirical context—the financial services industry—the positions requiring higher education include jobs relating directly to corporate finance, capital markets, and investing. As these job listings target applicants with an interest and aptitude in finance and related fields, these individuals may be more aware of firms' financial condition. In contrast, the positions that do not require advanced education may attract applicants with more limited knowledge or interest in current events in business.

While we cannot tease apart these potential mechanisms, our empirical findings indicate that jobs with more demanding educational requirements attract fewer applications during periods of financial distress. During distress, these jobs also attract a lower proportion of applicants from out of state. Columns 10.C and 10.D of Table 10 present results from an analysis of the proportion of applicants from out of state for jobs requiring low and high education. Similar to the results reported in columns 10.A and 10.B, the behavior of applicants seeking higher-education jobs may be driving the overall effect reported in Table 9. While the CDS price coefficient is not statistically different from zero for jobs requiring only high school, the effect is substantial for higher-education job postings. The percentage of applicants who apply from out of state for higher-education jobs declines by 3.5 percentage points when the CDS price increases by $0.10—a decrease of approximately 13 percent.[19]

These results suggest that distressed firms face particularly acute challenges in recruiting for skilled positions, likely impeding these firms' accumulation of human capital.

5.B Human capital retention

To shed light on distressed firms' ability to retain talent, in a final analysis, we examine firms' total number of employees and job postings. Over the study period, financially distressed firms reduced their total workforces and reduced them by more than other firms. The first two columns of Table 11 report results from analysis of employment data from Compustat. First, we regress the percentage change in a firm's number of employees from December 2007 to December 2009 on the firm's maximum CDS price in that period. As reported in column 11.A, the coefficient on the CDS price is negative and statistically significant—a $0.10 increase in the

[19] This difference contrasts with the similar baseline application rates from out of state across job postings requiring high school (26%) and college (27%) education.

maximum CDS price for $1 of protection is associated with an 11 percent decline in the number of workers in the firm over the two years ($p < 0.05$). Distressed firms are also more likely to experience any cuts in their workforce. In analysis reported in column 11.B, we examine the impact of distress on an indicator for negative net labor force growth over the two-year period. The resulting estimate suggests that a $0.10 increase in a firm's CDS price is associated with a nearly 20 percentage point increase in the probability that the firm's labor force shrinks ($p < 0.05$).

The aggregate reductions in the labor force of distressed firms could reflect decreases in labor demand. After all, distressed firms are often forced to lay off employees to cut costs. But decreases in the supply of labor at distressed firms likely play a role in the aggregate reductions as well, if current employees leave for more secure jobs elsewhere and it is difficult to attract qualified new applicants. To shed light on this possibility, we examine the quantity of job postings in this period. If the reductions in employment are completely explained by decreases in labor demand, then we should observe a concomitant relative decline in the volume of job openings posted. If the relative number of positions posted does not decrease, then this suggest that distressed firms suffer greater attrition by current employees.

Table 11 presents results from regressions examining the number of jobs posted. Using firm-month panel data, we regress the number of positions posted (column 11.C) or an indicator for whether any positions are posted (11.D) on firms' contemporaneous CDS prices and firm and month fixed effects. The month fixed effects control for aggregate movements in job postings, including the precipitous drop after October 2008, depicted in Figure 3. For both dependent variables, the coefficient is positive and not statistically significant, showing no indication of a relative reduction in recruiting, despite the firms' contemporaneous decrease in total

employment. Additional analyses, including specifications with controls for firms' lagged CDS prices and firms' lagged number of job postings and separate analyses for low- and high-education positions, also provide little evidence that firms' reduce their recruiting activities during periods of distress.

Put together, distressed firms' overall decline in employment and no decrease in hiring suggest that these firms experience greater employee turnover. In periods of weak corporate financials, current workers facing uncertain job security may search for more stable work elsewhere. Our previous analyses found that new job seekers were less likely to be attracted to distressed firms; the results presented in Table 11 suggest a similar attitude may prevail among current employees—in their case, a reluctance to remain aboard a sinking ship. Distressed firms appear to actively recruit to offset the loss of current employees, but these firms face a human resource challenge: as our evidence suggests, finding workers to fill vacancies can be particularly difficult just when the firm needs them the most.

6. Conclusion

Using several unique datasets from a large online job search platform, we find that: (1) job seekers' perceptions of firms' financial health are positively and statistically significantly related to firms' actual status; and, (2) the volume of applicants attracted to open job postings is negatively and statistically significantly related to firms' financial health. We find no evidence that the decline in applications results from shifts in labor demand: the results hold for same-job analysis, and advertised salaries, if anything, increase. Heterogeneity in the effect is consistent with reductions in labor supply at distressed firms: applications decrease most among workers with less protection from state unemployment insurance and among workers facing greater

upfront costs because they must relocate from out of the state.

Although it is impossible to quantify these effects' impact on firm profitability, one likely implication is that distress reinforces distress—a struggling firm may be unable to retain and attract workers who could contribute to recovery. Distress reduces firms' access to the national labor market and makes it particularly challenging to recruit for jobs with demanding educational requirements.

More broadly, our results imply that labor market frictions are an important consideration for corporate decisions related to risk taking—decisions including financial, operational, innovation, and growth strategies. The labor-related costs that we study provide firms with a strong incentive to avoid financial distress. Firms can abate these costs in any number of ways. Most directly, firm can reduce leverage and choose more conservative financial policies (Titman 1984; Berk, Stanton, and Zechner 2010; Agrawal and Matsa 2012). Firms can also reduce the probability of distress by reducing operating leverage (Lev 1974) or taking less risky projects (Hennessy and Whited 2005), or mitigate the costs by redesigning job tasks to require fewer firm-specific skills (Jaggia and Thakor 1994). Exploring the impact of labor market frictions on such corporate strategies is an important area for future research.

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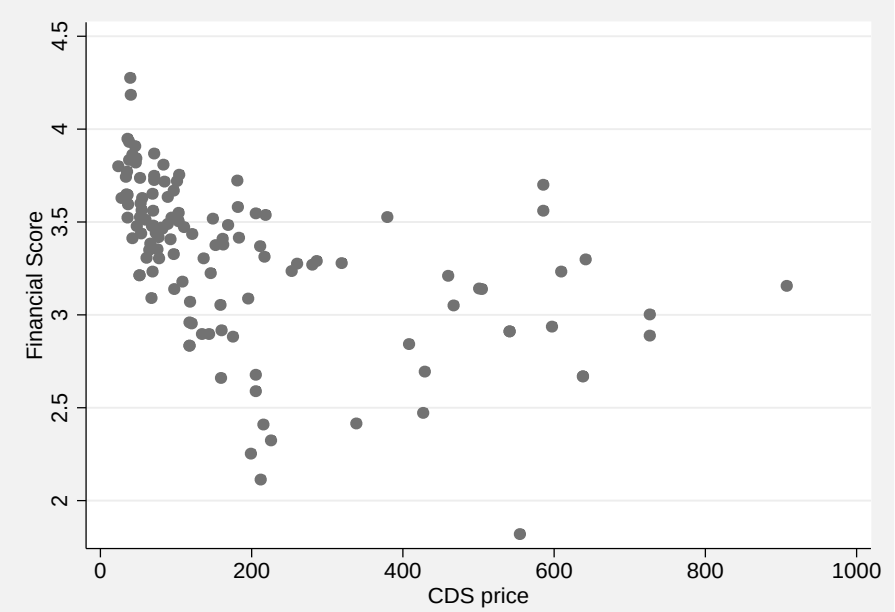
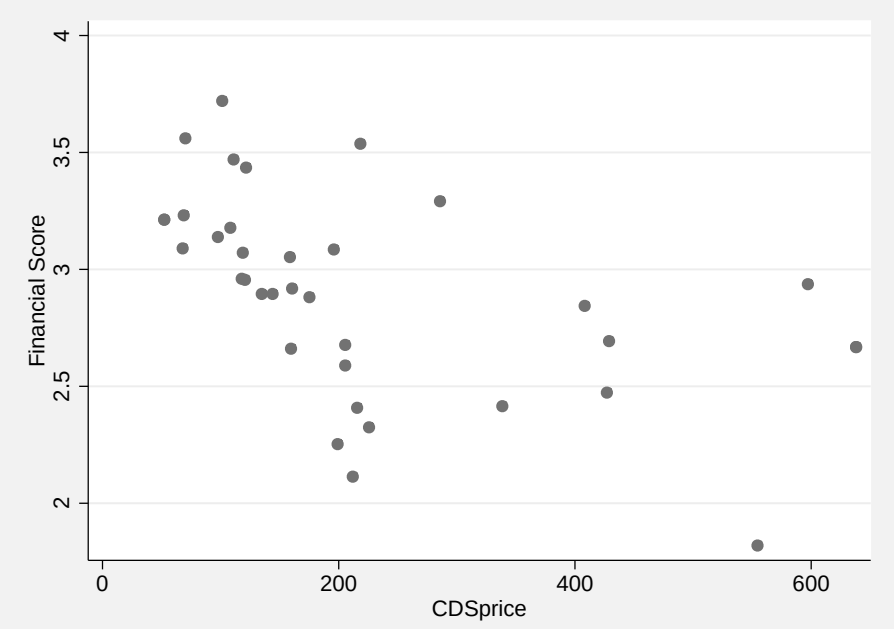
Figure 1 - Firms' Financial Scores and CDS Prices

Panel A: All firms

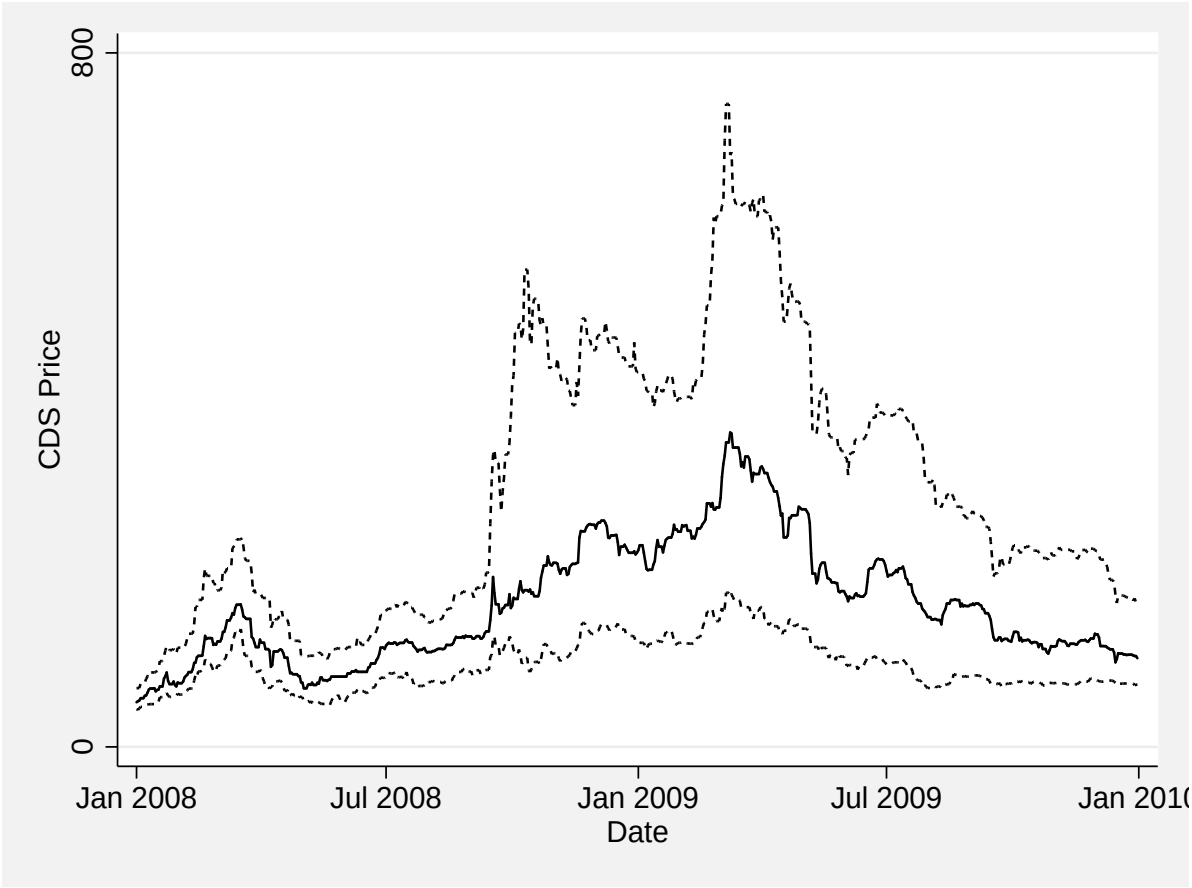


Panel B: Firms in financial industry



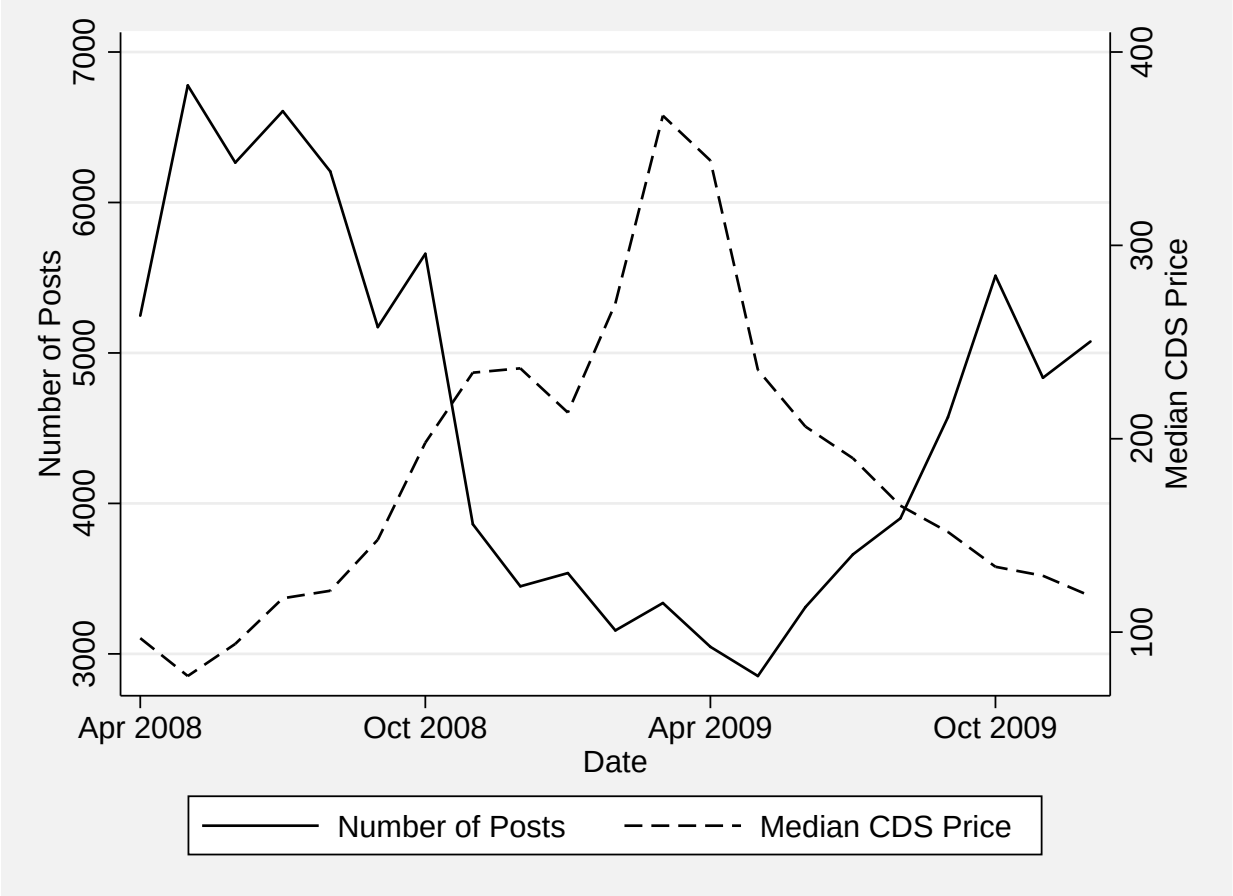
Notes: Average survey responses were scored from 1 ("weak performance") to 5 ("strong performance). CDS price is per $10,000 in CDS protection on the survey date. Panel A includes the 126 observations for which survey data and CDS prices are available; Panel B includes only the 37 of these observations that are in the financial industry. To conceal firms' identities, this figure includes only firms with CDS prices below 1,000.

Figure 2 - Daily CDS Prices for Large Financial Firms



Notes: The figure reports the 25th percentile, median, and 75th percentile daily CDS prices for the 99 firms in the financial services industry (including banks, investment firms and insurance companies) with total assets in excess of $25 billion and for which CDS prices are available. CDS price is per $10,000 in CDS protection. The median price is represented by the solid line.

Figure 3 - Number of Jobs Posted by Month



Notes: The number of jobs posted is the sum total of all jobs posted to the online platform each month by the 40 financial services firms of interest. CDS price is per $10,000 in CDS protection.

Table 1 - Survey Summary Statistics

Panel A: Survey summary statistics

# of unique firms	145
# of observations	194
# of observations with CDS prices	126

	# of obs.	*Mean*	*Std. dev.*
# of respondents	194	150.7	91.6
Financial score (1=v. weak … 5=v. strong)	194	3.3	0.4
Daily CDS price (for $10,000 in CDS protection)	126	242	319

Panel B: Firms in surveys (2008Q1)

	# of obs.	*Mean*	*Std. dev.*
Market cap (millions $)	124	31,974	54,067
Return on assets (%)	122	2.05	1.98
Sales growth (%)	134	11.16	25.83
Market-to-book ratio	124	1.65	0.81
Debt / Total assets	125	0.29	0.21

Panel C: Industry breakdown for survey firms

	# of firms
Accommodation and food services	10
Administrative and Support Services	4
Construction	3
Finance and insurance	30
Health care and social assistance	8
Information	17
Manufacturing	33
Other	2
Professional, scientific and technical services	10
Real estate, rental, and leasing	4
Retail trade	15
Transportation and warehousing	5
Wholesale trade	4

Notes: Panel B includes only firms for which Compustat data were available for Q1 of 2008. In Panel C, firms were classified based on NAICS code in Compustat.

Table 2: CDS Prices and Firms' Financial Score

Panel A. All firms

Dependent variable: Average financial score	2.A	2.B	2.C	2.D
CDS price	-5.32 ***	-5.48 ***	-5.77 ***	-6.06 ***
(for $1 CDS protection)	(1.54)	(1.32)	(1.55)	(1.14)
Fixed effects				
Industry (3-digit NAIC)		X		X
Quarter			X	X
R-squared	0.16	0.63	0.27	0.67
# of observations	126	126	126	126

Panel B. Financial industry firms only

Dependent variable: Average financial score	2.E	2.F	2.G	2.H
CDS price	-7.38 ***	-7.46 ***	-9.39 ***	-9.36 ***
(for $1 CDS protection)	(2.32)	(2.77)	(2.52)	(2.38)
Fixed effects				
Industry (3-digit NAIC)		X		X
Quarter			X	X
R-squared	0.23	0.30	0.35	0.41
# of observations	37	37	37	37

Notes: Robust standard errors are reported in parentheses.

*** $p < 0.01$

Table 3: Firms' Financial Score and Return on Assets, Sales Growth, and Market-to-Book Ratio

Panel A. All firms

Dependent variable: Average financial score	3.A	3.B	3.C
Return on assets (lagged 1 quarter)	2.69 ***		
	(0.76)		
Sales growth (lagged 1 quarter)		0.29 *	
		(0.14)	
Market-to-book ratio (lagged 1 quarter)			0.17 ***
			(0.05)
Fixed effects			
Industry (3-digit NAIC)	X	X	X
Quarter	X	X	X
R-squared	0.58	0.53	0.51
# of observations	162	180	167

Panel B. Financial industry firms only

Dependent variable: Average financial score	3.D	3.E	3.F
Return on assets (lagged 1 quarter)	23.28 ***		
	(4.77)		
Sales growth (lagged 1 quarter)		0.38 **	
		(0.16)	
Market-to-book ratio (lagged 1 quarter)			0.26 ***
			(0.07)
Fixed effects			
Industry (3-digit NAIC)	X	X	X
Quarter	X	X	X
R-squared	0.50	0.41	0.45
# of observations	45	55	47

Notes: Robust standard errors are reported in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4 - Application Data Summary Statistics

# of firms	40
# of weeks of available data	91
# of job postings	96,065

	# of obs.	*Mean*	*Std. dev.*	*Median*
# of jobs posted per firm over all weeks	40	2,401.6	3,687.5	659
# of jobs posted per week	91	1,055.7	330.6	976
# of jobs posted per firm per week	2,552	37.6	60.4	14
# of applications per job posting	96,065	57.7	111.1	28
# of applications per firm over all weeks	40	138,646.8	186,764.8	46,191
Daily CDS price (for $10,000 in CDS protection)	10,110	279	383	174

Table 5: CDS Prices and Applicant Counts

Dependent variable:	*ln(# of applicants)*					
	5.A	5.B	5.C	5.D	5.E	5.F
CDS price	-1.937 **	-1.784 **	-1.745 ***	-1.733 ***	-1.337 ***	-2.372 ***
(for $1 CDS protection)	(0.833)	(0.720)	(0.655)	(0.646)	(0.466)	(0.833)
Fixed effects						
Firm	X	X	X	X	X	X
Month	X	X				
State		X				
State-Month			X	X	X	
Job type				X		
Detailed job type					X	
Detailed job type-State-Month						X
R-squared	0.18	0.26	0.27	0.35	0.40	0.63
# of observations	96,065	96,065	96,065	96,065	96,065	96,065

Notes: Standard errors, adjusted for clustering at the firm level, are reported in parentheses.
** $p < 0.05$, *** $p < 0.01$

Table 6: Robustness Tests

Dependent variable:	*ln(# of applicants) Winsor (1% tails)*	*ln(# of applicants) Winsor (5% tails)*	*# of applicants*	*ln(# of applicants)*
	6.A	6.B	6.C	6.D
CDS price	-5.451 ***	-5.965 **	-56.089 *	
(for $1 CDS protection)	(1.783)	(2.391)	(31.519)	
ln(Stock price)				0.198 ***
				(0.043)
Fixed effects				
Firm	X	X	X	X
Detailed job type-State-Month	X	X	X	X
R-squared	0.63	0.62	0.63	0.64
# of observations	96,065	96,065	96,065	84,763

Notes: Standard errors, adjusted for clustering at the firm level, are reported in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: CDS Prices, Applicant Counts, and Salaries

Dependent variable:	*ln(# of applicants)*			*ln(Average annual salary)*		
	7.A	7.B	7.C	7.D	7.E	7.F
CDS price	-1.119 **	-0.962 **	-1.045 ***	1.792 *	1.738 *	1.569
(for $1 CDS protection)	(0.473)	(0.489)	(0.416)	(0.946)	(0.911)	(1.049)
Fixed effects						
Firm	X			X		
Month			X			X
State-Month	X	X		X	X	
Job title	X			X		
Firm-Job title		X			X	
Firm-State-Job title			X			X
R-squared	0.74	0.76	0.80	0.98	0.98	0.99
# of observations	96,065	96,065	96,065	6,391	6,391	6,391

Notes: Standard errors, adjusted for clustering at the firm level, are reported in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: CDS Prices, UI benefits, and Applicant Counts

Dependent variable:	*ln(# of applicants)*					
	8.A	8.B	8.C	8.D	8.E	8.F
CDS price	-1.916 **	-1.774 **	-1.708 ***	-1.695 ***	-1.302 ***	-2.234 ***
(for $1 CDS protection)	(0.828)	(0.737)	(0.663)	(0.657)	(0.472)	(0.872)
CDS price x Max UI benefit	2.915 **	2.982 **	4.857 ***	4.878 ***	4.674 ***	4.554 ***
	(1.320)	(1.320)	(1.416)	(1.239)	(1.144)	(1.426)
Fixed effects						
Firm	X	X	X	X	X	X
Month	X	X				
State		X				
State-Month			X	X	X	
Job type				X		
Detailed job type					X	
Detailed job type-State-Month						X
R-squared	0.19	0.28	0.27	0.35	0.40	0.63
# of observations	96,059	96,059	96,059	96,059	96,059	96,059

Notes: Max UI benefit is the state-specific maximum that a recipient can receive for a single unemployment spell; the variable is demeaned before it is interacted with the CDS price. Although not reported in the table, regression 8.A includes Max UI benefit (not interacted) as a control; in all other specifications, that estimate is absorbed by the state fixed effects. Standard errors, adjusted for clustering at the firm level, are reported in parentheses.

** $p < 0.05$, *** $p < 0.01$

Table 9: CDS Prices and Location of Applicants

Dependent variable:	*Percentage of applicants who live out of state*					
	9.A	9.B	9.C	9.D	9.E	9.F
CDS price	-19.65	-18.14 *	-17.02 **	-14.96 ***	-13.10 ***	-16.67 ***
(for $1 CDS protection)	(17.27)	(10.41)	(7.37)	(4.41)	(4.43)	(5.17)
Fixed effects						
Firm	X	X	X	X	X	X
Month	X	X				
State		X				
State-Month			X	X	X	
Job type				X		
Detailed job type					X	
Detailed job type-State-Month						X
R-squared	0.13	0.56	0.59	0.63	0.65	0.83
# of observations	46,031	46,031	46,031	46,031	46,031	46,031

Notes: Regressions include only jobs for which >80% of applicants have location information and are weighted by the number of applicants. Standard errors, adjusted for clustering at the firm level, are reported in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: CDS Prices, Applicant Counts, and Location by Required Education

Dependent variable:	*ln(# of applicants)*		*Percentage of applicants who live out-of-state*	
	Jobs requiring high school or less	*Jobs requiring 4 -year college degree*	*Jobs requiring high school or less*	*Jobs requiring 4 -year college degree*
	10.A	10.B	10.C	10.D
CDS price	-0.518	-2.091 *	-9.24	-34.95 *
(for $1 CDS protection)	(1.537)	(1.129)	(9.44)	(19.41)
Fixed effects				
Firm	X	X	X	X
State-Month	X	X	X	X
Job type	X	X	X	X
R-squared	0.32	0.38	0.60	0.63
# of observations	11,802	25,193	6,127	13,885

Table 11: CDS Prices, Employment Changes, and the Volume of Job Postings

Dependent variable:	*% Change in firm's labor force (Dec. 2007–Dec. 2009)*	*Indicator for labor force reduction (Dec. 2007–Dec. 2009)*	*# of jobs posted per month*	*Indicator if jobs posted per month > 0*
	11.A	11.B	11.C	11.D
Maximum CDS price, 2008–2009	-114.42 **	1.96 **		
(for $1 CDS protection)	(45.52)	(1.03)		
CDS price			142.62	0.37
(for $1 CDS protection)			(143.87)	(0.27)
Fixed effects				
Firm			X	X
Month			X	X
R-squared	0.15	0.61	0.73	0.61
# of observations	38	38	836	836

Notes: Columns 11.A and 11.B exclude two privately-held firms for which employment data are not available. Standard errors, adjusted for clustering at the firm level in columns 11.C and 11.D, are reported in parentheses.
** $p < 0.05$