Do Employees Cheer for Private Equity? The Heterogeneous Effects of Buyouts on Job Quality

Will Gornall, Oleg Gredil, Sabrina T. Howell, Xing Liu, Jason Sockin *

October 27, 2021

Abstract

We examine how private equity investments affect job quality. Leveraged buyouts (LBOs) – unlike standard M&A or growth equity deals – reduce employee satisfaction with compensation, work-life balance, firm culture, and senior management. These effects are driven by longer-tenured and lower-skill workers, and by high-leverage deals. However, reported pay is unaffected for most workers, while managers earn substantially more incentive pay. Using deal-level cash-flow return data, we find that LBOs have more IRR pass-through to employee satisfaction than mimicking public equity investments, with 1% higher IRR associated with 0.7% more incentive pay. Overall, LBOs appear to lead to both more rent-sharing with employees and increased job insecurity, particularly in high-leverage deals.

Keywords: private equity, leveraged buyouts, job quality, employees, corporate culture, non-pecuniary amenities, implicit contracts **JEL:** G24, G32, J31, J32

^{*}UBC, Tulane, NYU Stern & NBER, UBC, UPenn & CESifo. Emails: will.gornall@sauder.ubc.ca, ogredil@tulane.edu, sabrina.howell@nyu.edu, xing.liu@sauder.ubc.ca, jason.sockin@gmail.com. Howell is the corresponding author and is located at NYU Stern, 44 West 4th St KMC 9-93, NY NY 10012. We thank Ammon Lam, Cangyuan Li, Jun Wong, and Tej Chilukuri for their excellent research assistance. Gornall thanks the SSHRC for their support and gratefully acknowledges that this research was undertaken, in part, thanks to funding from the Canada Excellence Research Chairs program awarded to Dr. Erik Snowberg in Data-Intensive Methods in Economics. Gredil thanks StepStone Group for providing data access. Sabrina Howell thanks the NYU Stern Center for Sustainable Business.

A worker's relationship with her employer involves far more than money. Company culture, commitment to work-life balance, and management are central to job quality but do not show up on a paycheck (Guiso, Sapienza, and Zingales, 2015; Graham et al., 2017; Gorton and Zentefis, 2020). Although employees at larger firms may never meet the firm owners, a growing literature has linked employee outcomes to ownership structure. In this paper, we explore the impact of private equity ownership on job quality.

Private equity has a large footprint on the US economy, accounting for more than one-third of recent M&A transactions.¹ The asset class has delivered strong financial returns to both investors and fund managers (Guo, Hotchkiss, and Song, 2011; Harris, Jenkinson, and Kaplan, 2014; Robinson and Sensoy, 2016; Korteweg and Sorensen, 2017).² These returns come from a combination of operational and capital structure changes (Lerner, Sorensen, and Strömberg, 2011; Bloom, Sadun, and Van Reenen, 2015; Fracassi, Previtero, and Sheen, 2021).³

Although private equity deals generate value for owners, their effect on employees, perhaps a firm's most important stakeholders, is far from clear. One hypothesis is that private equity investors create value in part by extracting rents from employees, imposing cost-cutting measures that reduce amenities, job security, and time-off. Consistent with this, media reports highlight layoffs and oppressive working conditions after private equity buyouts.⁴ Under that model, returns to investors come at the expense of employee well-being. An alternative is that by increasing efficiency and profitability, private equity improves employee satisfaction, including via rent-sharing of value creation. Private equity owners might even make NPV-positive investments in employee satisfaction and firm culture that were forgone by myopic or capital-constrained prior owners.⁵

We test and help reconcile these competing predictions. We ask how buyouts affect employee perceptions of job quality, including not just compensation but also non-pecuniary amenities, and examine how any effects differ across both deal and employee types. We use employee reviews from the website

¹Authors' calculations based on Pitchbook and Dealogic 2018-19 data.

²The literature finds that private equity outperforms public markets in net-of-fee returns to investors, while also yielding large profits for private equity fund managers. Also see Kaplan and Stromberg (2009), Karabarbounis and Pinto (2018), Ang et al. (2018). There is, however, some controversy about the impacts of risk, leverage, and liquidity on performance (Lerner and Schoar, 2004; Franzoni, Nowak, and Phalippou, 2012; Axelson et al., 2013).

³Also see Cornelli and Karakaş (2012), Acharya et al. (2013), Bernstein and Sheen (2016), Agrawal and Tambe (2016), Bernstein et al. (2017), Eaton, Howell, and Yannelis (2020), Ewens, Gupta, and Howell (2021) and Gupta et al. (2021), among many others.

⁴See, for example, this Guardian article or this Atlantic article, accessed August 3, 2021.

⁵Some studies have found that a strong culture and satisfied employees are associated with higher profits (Edmans, 2011; Welch and Yoon, 2020).

Glassdoor and focus on four dimensions that speak to the crucial intangibles of the employer-employee relationship: compensation, work-life balance, culture, and senior management. We merge the Glassdoor firms to private equity deals from Pitchbook and M&A transactions from Capital IQ. We further match the private equity transactions to deal-level returns data from Stepstone, a large fund of funds. Our analysis dataset includes over three million reviews of jobs by employees currently working at 270,000 unique companies posted between 2008 and 2019.

Why are employee reviews important to study? There is growing interest in job quality, and at some level gauging job quality requires eliciting the opinions of workers themselves, who, as Guiso, Sapienza, and Zingales (2015) point out, offer a ground truth on firm culture that does not always align with how the firm advertises its own culture. Our data directly measure non-pecuniary amenities. Equally important, our data shed new light on earnings relative to standard administrative datasets, such as those available at the U.S. Census Bureau. The Glassdoor measures cover all compensation, including equity, both via reported salary and incentive pay, as well as via satisfaction with that pay. Satisfaction ratings reflect the utility of compensation levels, which is arguably most relevant for welfare. Existing research has extensively validated Glassdoor employee review data in particular, showing that it is informative about firm outcomes and representative of the U.S. wage distribution.⁶

Our research design is a differences-in-differences model, using firm and industry-time fixed effects with never-private equity-owned firms serving as controls (we use matching to generate controls for an alternative specification). Although this design is common, it faces two fundamental identification challenges: selection of targets by private equity firms, and selection of employees into leaving reviews.

Firm-level selection is a concern because private equity firms do not pick targets at random – they acquire companies they see as having growth potential and the potential for operational improvements. This raises the possibility that private equity firms target firms on track to experience declines in employee satisfaction. We address this in several ways. First, we use dynamic differences-in-differences event studies to assess whether target firms appear to be on track towards the changes we observe. These show no pre-trends and a discontinuous change after the buyout, suggesting a causal relationship given the convention in the literature.⁷ Second, most of our results are across deal (e.g., low versus high leverage) or employee

⁶See Edmans (2011); Karabarbounis and Pinto (2018); Sockin and Sockin (2019); Green et al. (2019); Liu et al. (2019); Chemmanur, Rajaiya, and Sheng (2019); Sheng (2019); Sockin and Sojourner (2020); Huang, Li, and Markov (2020); Lee et al. (2020); Sockin and Sockin (2021)

⁷We also see discontinuous increases in the usage of terms such as 'cost-cutting' and 'uncertainty' around the deal data, providing support for both causality and specific mechanisms.

characteristics (e.g., long versus short tenure), which address many selection stories. Third, our results are robust to a host of firm-level controls.

People visit the Glassdoor website to read and write company reviews, creating an employee-level selection concern. Glassdoor requires contributing a review in order to view reviews on the platform, which reduces both selection bias and the polarization inherent in online reviews (Marinescu et al., 2018). Since reviews are anonymous, there is no clear reason for reviewers to misrepresent. Our key assumption is that whatever makes a person write a review at an LBO target is the same as what makes them write a review at a control firm. In our main analysis, we consider only reviews by current employees, limiting bias from laid-off and disgruntled employees. We also aggregate reviews to company-quarter averages, which addresses potential buyout-induced changes in the number of reviewers. Finally, changes in the number and composition of reviewers around the buyout are in practice small and insignificant.

We first analyze the effects of conventional M&A and three types of private equity deals: LBOs, management buyouts (MBOs), and growth equity deals. In an LBO, the private equity fund acquires a company with mostly borrowed funds. A key feature of LBOs is that this debt is placed on the target company's balance sheet so that the company owes the debt which funded its acquisition, rather than the private equity fund. We show that after an LBO, employee satisfaction with compensation declines by 0.083 points on a one-to-five scale, equivalent to a 12.5% loss in total pay (based on the correlation between pay and satisfaction with compensation). There is a slightly larger negative effect on satisfaction with firm culture and a slightly smaller negative effects on satisfaction with work-life balance and senior management. In contrast, the negative effects of conventional M&A are weaker and appear only for compensation and senior management. MBOs, where leverage increases but operations are more constant, also see a large negative effect on compensation but not on other outcomes. There are no effects at all of growth equity deals, where the private equity fund takes a minority stake and there is typically little increase in leverage. While these deal types have many differences, the results begin to point to something about the buyout model having negative effects on employees, particularly when it comes to culture.

The remainder of the paper focuses specifically on LBOs, examining three dimensions of the owneremployee dynamic to understand what may be driving the average effects. The first is the reallocation of surplus across employee groups. We find that long-tenured workers are the most adversely affected, especially on the culture dimension, while people hired after the buyout are not affected at all. This indicates a role for sorting, where new hires are a better match for the new operational structure or employment contract (Lazear, 1998; Eriksson and Kristensen, 2014; Liu et al., 2019). The negative effects of LBOs on compensation, culture, and senior management are driven by the lowest-skilled workers in entry-level jobs. In contrast, the negative effects on work-life balance appear only for managers. The second dimension is incentive compensation. LBOs lead to large increases in performance pay for managers, but not for other employees. Furthermore, while managers enjoy a small increase in base pay, there is no average change in reported pay for other employees.

The third dimension is risk sharing, which we study through the roles of leverage, layoffs, and rent-sharing. Higher leverage deals have far more negative effects on job quality along all dimensions, a relationship that appears roughly linear. The leverage relationship is strong, unlike other characteristics such as size and deal type (public-to-private, corporate divestiture, and vanilla). Leverage is also much more important than large one-time layoffs, which we examine using a novel panel of LinkedIn profile information collected specifically for our target firms. While there is evidence of significant one-time layoffs at the time of the buyout, the satisfaction and leverage results appear independent of layoffs. Also, the persistence of the effects for about three years after the buyout points to reduced job security as a more permanent operational change.

We study the passthrough of returns to employees using deal-level cash flows from StepStone's SPI database. To our knowledge, this is the first paper to link private equity returns to operational outcomes. The relationship between changes in employee satisfaction around the deal and investor returns could be negative if private equity returns come in part from extracting employee surplus. There could be no relationship if private equity always extracts employee surplus in the same way regardless of the ex-post deal success. Alternatively, if firms share some rents with employees as in bargaining models of wage-setting (Stole and Zwiebel, 1996; Card et al., 2018), then employee satisfaction might increase with deal returns. The evidence is most consistent with the latter view, especially for compensation. We find a positive elasticity, where employee satisfaction changes increase in returns. (The average change is negative in our returns-matched sample, as in the full sample.) This aligns with previous literature showing firm performance to be positively associated with employee satisfaction (Verwijmeren and Derwall, 2010; Edmans, 2011; Bae, Kang, and Wang, 2011; Edmans, Li, and Zhang, 2014; Guiso, Sapienza, and Zingales, 2015; Green et al., 2019). Therefore, we ask whether the association is stronger for private equity targets than for public firms. While both types of firms appear to share rents with employees, IRR pass-through is stronger for private equity-owned firms, with a 1% higher deal IRR being associated with 0.7% more incentive pay.

To summarize, pre-existing employees lose from LBOs, but it is not the case that the high returns in private equity come from deals that are particularly bad for employees. What mechanisms may explain these results? Several classic stories may be at play, but appear to provide only partial explanations. One is the benefits of the quiet life (Hicks, 1935; Schoar, 2002; Bertrand and Mullainathan, 2003); where previous managers may have been unwilling to enact unpleasant reforms. Related is Shleifer and Summers (1988)'s idea that acquirers can exploit opportunities to break implicit promises to employees that were established by the previous owners. A more positive view is that private equity implements operational changes such as efficiencies which some employees experience negatively (Kaplan, 1989). These theories are consistent with higher variable pay and worse work-life balance for managers and with long-tenured, low-skill employees being more adversely affected. However, they are less consistent with the robust leverage result and with the effect being larger relative to M&A, MBO, and growth equity deals. A theory that helps to explain the leverage result is Jensen (1986)'s free cash flow hypothesis, in which debt serves as a disciplining device by reducing the amount of cash available for employees to capture. This, however, is less consistent with finding no declines in actual pay.

Theories that bring together some of these ideas and explain our results particularly well focus on the connection between unemployment risk and capital structure, which creates a link between leverage and pay. Higher leverage increases the chances of firm distress, which causes layoffs, which in turn are costly to workers who are not fully insured and find it difficult to obtain an equivalent job (Cantor et al., 1990; Asquith, Gertner, and Scharfstein, 1994; Sharpe, 1994). Especially consistent with our results is the theory in Berk, Stanton, and Zechner (2010). They start from the perspective that the employment contract insures workers against shocks. However, the firm cannot commit to paying when it is insolvent. Higher leverage increases the chance of insolvency, reducing the value of the insurance, and requiring the firm to increase worker pay. This process leads to a persistent clientele effect, where some firms have sub-optimally low leverage and attract particularly risk-averse employees. Empirical work in support of this view includes Chemmanur, Cheng, and Zhang (2013), Agrawal and Matsa (2013), and Simintzi, Vig, and Volpin (2015).

The Berk, Stanton, and Zechner (2010) theory requires firms to uphold an implicit contract between shareholders and workers. LBO investors may be exploiting an arbitrage opportunity: With the decline in unions and labor power generally, modern labor markets may not require firms to abide by the implicit contract. LBO investors may target firms that are under-levered from the perspective of the tax benefits of debt, lever them up, but not increase pay as the implicit contract would require. Our results support

this story: The firm increases leverage but keeps pay constant, which reduces employee satisfaction with pay. The model also predicts that effects should increase in tenure due to entrenchment effects. This is among our most robust results and one that holds with controls for employee skill. Third, the model predicts that employee-firm matching on risk aversion should mean no effect for new hires, which is what we find. Fourth, the model predicts that effects should be most severe among workers facing higher costs of finding a new job. Consistent with this, we find that unskilled workers are most adversely affected; they may face higher costs from liquidation if they are losers in the changing economy. We further show that the effects are stronger in industry-years with higher unemployment. It is important to emphasize that this mechanism is fundamentally speculative because leverage is endogenous. That said, our approach is in line with previous literature, which has shown only correlations between employment or pay and leverage.⁸

This paper contributes to the literature on the conflict of interests between labor and capital (Atanassov and Kim, 2009). We show for the first time how ownership changes – both conventional M&A and private equity – affect workers' non-pecuniary amenities and perception of firm culture differently according to their level of human capital and replaceability. While the literature has separately studied how corporate ownership structures affect firm outcomes (e.g. Maksimovic and Phillips (2008), Cremers, Nair, and John (2009), and Bena and Li (2014)) and the importance of culture, management, and other non-wage amenities (e.g. Levit and Malenko (2016)), rarely have they been examined together. Our findings are consistent with the conclusion of Guiso, Sapienza, and Zingales (2015) that "a focus towards shareholders' value-maximization undermines the ability of a company to sustain a high level of integrity capital," because – relative to other ownership types – LBOs imply a transition to higher-powered incentives to maximize short-term profit (Kaplan and Stromberg, 2009). Related work that touches more broadly on employee welfare around acquisitions or takeovers includes Pontiff, Shleifer, and Weisbach (1990), Pagano and Volpin (2005), John, Knyazeva, and Knyazeva (2015), and Dessaint, Golubov, and Volpin (2017).

Our paper joins studies of how private equity ownership affects workers, which includes Boucly, Sraer, and Thesmar (2011) and Davis et al. (2014) on the number of employees, Cohn, Nestoriak, and Wardlaw (2021) on workplace safety, Olsson and Tåg (2017) on unemployment incidence at LBO targets in Sweden, Fang, Goldman, and Roulet (2021) on wage gaps at LBO targets in France, and Antoni, Maug, and Obernberger (2019) on employment and wages at LBO targets in Germany. Our paper extends this work in

⁸The few examples of exogenous variation, such as Agrawal and Matsa (2013) and Simintzi, Vig, and Volpin (2015), come from the side of worker bargaining power, not leverage (which could be related to worker bargaining power through channels besides this theory).

at least four ways. First, we shed new light on the importance of non-pecuniary amenities such as employees' perceptions of firm culture. Non-pecuniary job amenities are an important but largely unstudied and not fully priced dimension of the economy (Mas and Pallais, 2017; Lins, Servaes, and Tamayo, 2017; Lamadon, Mogstad, and Setzler, 2019). Second, our performance pay measure includes stock option grants and other types of variable pay. Third, we study the real effects of U.S. buyouts on a large and representative sample. As Morris and Phalippou (2020) note, the literature on private equity ownership has generally used small and selected samples restricted to a single industry or European country with markedly different labor laws from the U.S. Finally, we shed light on the connection between employee outcomes and value creation as measured by deal-level returns.

Finally, this paper is relevant to the growing emphasis that institutional investors place on ESG (Barber, Morse, and Yasuda, 2021; Lins, Servaes, and Tamayo, 2017), one component of which is employee wellbeing. In supplementary analysis, we do not find that private equity funds which profess considering ESG factors have better effects on job quality. One implication of the returns analysis is that if limited partners were able to screen private equity deals on ex-post employee satisfaction holding all else fixed, the result would be better financial returns. Our analysis does not shed light on the direction of causality, though the literature cited above suggests that more satisfied employees can lead to better firm outcomes.

1 Data Sources and Summary Statistics

We employ six sources of data. Employee-level job quality is from Glassdoor. We match companies in the Glassdoor data to private equity deals from Pitchbook, M&A transactions from Capital IQ, and employment histories from LinkedIn. We gather investor returns data from Stepstone and fund ESG data from Preqin.

Employee Review Data We begin with comprehensive employee review data from Glassdoor.com between the platform's inception in January 2008 and the end of 2019. These data cover almost all major companies and contain measures of employee satisfaction and reported pay and benefits, as well as the reviewer's job title, tenure, employment status, and location. Figure 1 offers two examples of the reviews that compose the underlying data. In the Dell review (Panel A), we hover the mouse over the overall rating (a two out of a maximum of five) to view the dimension ratings. This reviewer gave Dell a one on Career Opportunities but a four on Compensation & Benefits. The PetSmart review (Panel B), written shortly after

the firm went through a public-to-private buyout, highlights an employee's reaction to the deal. The reviewer expresses new uncertainty, distrust of upper management, and concerns that "Cost reductions have sacrificed customer service."

Why do people review on Glassdoor? They are likely usually searching for jobs, though they may also simply be interested in knowing more about their own company or another one. Glassdoor employs a give-to-get model, where a review must be entered in order to view the reviews on the website. This reduces the selection bias and polarization that are inherent in online reviews (Marinescu et al., 2018). Evidence of this is the fact that the distributions of the four ratings exhibit central tendency, shown in Appendix Figure A.1. For example, the mean Senior Management rating is 3.4 with a standard deviation of 1.4 (recall that the range is one to five).

Nonetheless, the reviews do not reflect a random draw of company employees.⁹ This response bias is a challenge for all survey-based papers. In our analysis, we make the key assumption that whatever makes a person write a review at an LBO target is the same as what makes them write a review at a control firm. We take several steps to both make our results robust to violations in this assumption and to test this assumption. First, perform analysis at the company-quarter level, to address differences in the number of reviews over time, or at the company-quarter-cohort level (for example, long-tenured employees at a firm in a year). These specifications are not affected by potential changes in the number of people overall or in the cohort who submit reviews. Second, we drop former employees, the most obvious source of bias, although our results continue to hold with that cohort. Third, most of our analysis focuses on heterogeneity interactions, which mitigates concerns about selection, since we are, for example, comparing the average for longer-tenured to the average for shorter-tenured workers at the same firm in the same year, relative to the comparison between these same groups at other firms. Fourth, we replicate our key analysis with controls for key observable employee characteristics. Finally, in practice, we do not see significant changes in the number of composition of workers giving reviews around buyouts (as discussed below).

Much existing research on how private equity affects employees uses administrative sources, in particular employee-employer panels available at the U.S. Census Bureau and similar institutions in other countries. The major advantage of these sources is that they do not face the problem of selection into reviewing. However, employee reviews and Glassdoor data specifically offer insights that are not available

⁹In matching Glassdoor data to Compustat data on public companies, we find that total reviews as a share of U.S. employees was 2.5% in 2015.

elsewhere, and in fact address precisely the weaknesses of standard administrative data. First, they shed light on corporate culture and other non-pecuniary amenities, which are completely absent from Census data. Second, they contain information about performance pay, including stock compensation and benefits, while Census contains only base salaries. Third, observations are identified by the day and thus are "real time," while the Census wage data are annual. Fourth, we observe granular occupation data, while the Census data have no occupation information. Finally, Glassdoor data may be linked to proprietary information such as our deal-level returns data, while Census data are tightly sequestered.

In using the Glassdoor data, we consider only U.S.-based current employees of U.S. companies, yielding a final sample of 3,300,000 reviews from 271,000 companies. For these reviews, we focus on seven main dimensions. Four measure employee satisfaction with Compensation & Benefits, Culture & Values, Senior Management, and Work-Life Balance. We abbreviate the first two of these to "compensation" and "culture" for parsimony and because we find no effects on benefits when considered separately. These measures are quantified in numeric ratings, which range from one (worst) to five (best).¹⁰ The next three dimensions concern reported pay: base salary, variable pay, and an indicator for any variable pay. Variable pay, also called "performance pay," includes bonuses, stock options, profit sharing, and sales commissions, all of which are reported separately. Table 1 Panel A summarizes these ratings. We present a correlation matrix across the seven measures (plus benefits ratings) in Appendix Table A.1; the dimensions are correlated with one another in intuitive ways, but they each contain independent information.¹¹

Existing literature establishes that Glassdoor review data are both informative about firm outcomes and representative of the labor market, albeit somewhat skewed toward skilled occupations. Karabarbounis and Pinto (2018) show that the wage distribution of Glassdoor reviewers is consistent with external data from the U.S. Census Bureau. Sockin and Sockin (2019) show pay representativeness at the industry level, and Martellini, Schoellman, and Sockin (2021) document external validity of earnings using Department of Education college earnings data. Glassdoor reviews predict stock returns (Green et al., 2019; Sheng,

¹⁰Although the scores are numeric, they are more accurately thought of as categorical responses, which raises two concerns. First, the one-to-five system censors extremely negative and extremely positive reviews. This problem is reduced by the relatively low number of one- and five-star reviews. Second, the reviewers interpret categories in a non-cardinal way: a company with ten two-star reviews and ten four-star reviews is not the same as a company with twenty three-star reviews. We use linear regressions to allow for easy interpretation of the coefficients and because the changing nature of categories invalidates the underlying assumptions of ordinal regression techniques. This non-cardinality should not bias our coefficients but should be kept in mind for interpretation.

¹¹In supplemental analysis, we consider six additional measures including benefits ratings. We exclude some of these from our main analysis because they are either highly correlated with our main variables or are not well populated. Glassdoor's reviewing policies changed over time. In May 2012 the platform added Culture & Values as a dimension and eliminated half-point scores as well as partial reviews. In September 2020 it added a score for Diversity & Inclusion. Glassdoor has also varied over time the number of reviews one can view before being required to post a review. Our time fixed effects control for these dynamics.

2019), operating performance (Huang, Li, and Markov, 2020), and firm financing (Chemmanur, Rajaiya, and Sheng, 2019). Lee et al. (2020) show that the reviews react to corporate events such as scandals. In sum, we are confident that the ratings offer reasonably truthful information about the state of the company.

The Glassdoor data include reviewers' tenure and job title, which we use to infer reviewer characteristics as summarized in Table 1 Panel B. The data contain new hires and veteran employees, with 25% of employees working no more than one year at the firm, 29% one to three years, 19% three to five years, and 26% five or more. We infer workers' roles using their reported job titles. Text matching reveals that one out of six has a job title identifying them as a manager. We merge job titles to OCC codes using the mapping in Atalay et al. (2020).¹² O*NET data from the U.S. Department of Labor, Employment and Training Administration provides rich information on the nature of each of these.¹³ About 14% of the matched raters are in jobs that typically require no more than a year of work experience, while at the other end of the spectrum 23% are in jobs requiring more than five years of experience. The majority (76%) are in jobs that typically require a college degree, while 18% are in jobs that do not and the remaining 6% are in jobs that require a Masters' or Professional degree. Finally, we use data from textual comments in the reviews, which is explained below where these data are analyzed.

We construct company-quarter level variables using the review-level information. Although users can leave multiple reviews, the vast majority do not and so we abstract from reviewer identity. For the outcomes of satisfaction ratings, pay, and the textual indicators we take the average of reviews in the company quarter (the results are robust to using the median). For worker characteristics such as tenure or education, which we employ as right-hand-side variables for heterogeneity analysis, we split the sample according to some quantile and then calculate the average company-quarter level outcome for each quantile.

Private Equity and Acquisition Deal Data To obtain private equity deal information, we manually match Glassdoor firms to private equity deal targets in the Pitchbook database. We focus on targets based in the U.S. with a transaction date between 2010 and 2016 which have Glassdoor review data on either side of the deal. PitchBook is widely regarded as one of the most comprehensive private equity databases and is especially strong for the U.S. data and the most recent decade. We drop non-U.S. deals, secondary transactions (where company ownership is transferred between two private equity investors), PIPEs and other investments in

¹²Retrieved from https://occupationdata.github.io/ on Nov 1, 2020.

¹³Only 39% of reviews are matched because job titles are missing for many reviews and are ambiguous (e.g., Associate) for others.

companies that were not taken private, and debt-only deals. This gives us a total of 7,701 deals.

Within this sample, we consider three mutually exclusive private equity business models. The first is leveraged buyouts (LBOs) corresponding to 3,572 deals in the Pitchbook data. In an LBO, a private equity fund takes a controlling stake in the target company. The private equity firm borrows most of the money needed to purchase the company, but it organizes the transaction so that the debt is placed on the target company's balance sheet. That is, the target company owes the money used to purchase it, not the private equity fund. The second group is management buyouts (MBOs), corresponding to 484 deals. In an MBO, the existing managers of a company purchase a controlling interest with the help of a private equity firm. MBOs typically increase company leverage as well, but tend to be in the lower part of the LBO leverage distribution.¹⁴ The third group is growth equity investments, corresponding to 2,934 deals. Growth equity is closer to venture capital but for later-stage companies, and involves the private equity firm taking a non-controlling stake in a company. Here, the cash from the investment goes to the company rather than to selling shareholders. We retain only a company's first deal in each of these three groups.¹⁵

Our main analysis focuses on LBOs, which is at a conceptual level the strongest private equity treatment and is the deal type that shows the most robust effects on job quality in our data. We divide LBOs into three mutually exclusive categories based on Pitchbook's deal classification scheme: public-to-private deals, corporate divestitures, and 'vanilla' LBOs. In a public-to-private deal, private equity investors purchase and take private a public company, such as the 3G Capital-led buyout of Kraft. Although small in number, these deals account for many of our reviews as the target companies tend to be large. Corporate divestitures occur when a private equity firm acquires a subsidiary of a corporation, and either holds it as a standalone firm or rolls it into another existing company. Examples of this type of deal include Cerberus' purchase of grocery store chain Albertson's from Supervalu in 2013, and the spin-off of McGraw Hill Education to Apollo. Corporate divestiture deals have significant cultural and management implications because they typically cause the corporate form to change from a diversified conglomerate to a more focused firm. We define a vanilla LBO as any other private equity purchase of a standalone, privately held company. One example of a

¹⁴See for example https://www.investopedia.com/terms/m/mbo.asp.

¹⁵For example, RestorixHealth was taken private in 2010 by Cressey & Company and Leonard Green & Partners, raised growth equity twice in 2014, and then was sold to a different private equity consortium in 2015. It enters our sample twice: the initial LBO enters our main sample and the first growth round enters our growth equity sample. This example is illustrative but far from typical as less than 1% of our companies have multiple LBOs. Some deal types fit into multiple classifications. In these cases, we classify deals in the following order of priority (as mentioned above, a deal in our data is assigned to only one type): growth equity, MBO, public-to-private, corporate divestiture, vanilla LBO. We will compare our deal samples against a control group of never-treated firms that do not have an LBO, MBO, growth equity deal, or secondary buyout in our Pitchbook sample.

vanilla LBO in our data is Blackstone's 2015 buyout of Stearns Lending, which provides mortgage lending services.

We matched 2,762 (77%) of the qualifying LBO deals to Glassdoor companies, 405 of the MBOs (84%), and 1,927 of the growth equity deals (66%). In our main analysis, we restrict to the 1,371 LBO, 178 MBO, and 700 growth equity deals within these matched samples that have at least one review by current employees in both pre- and post-deal periods. Table 1 Panel C provides summary statistics about the final sample of matched LBO deals that are used in our analysis. Appendix Table A.2 contains summary statistics about the growth equity and MBO sample. Appendix Table A.3 compares deal characteristics across all Pitchbook deals, Glassdoor matched deals, and Glassdoor matched deals in our analysis sample. The matched deals are reasonably representative of the full dataset (Appendix Table A.3). They have a similar industry breakdown; for example, 16% (15%) of deals in our matched (full) sample are in healthcare.¹⁶ Figure 2 shows that the matched deals are distributed relatively uniformly across our sample period. Overall, we believe our data are among the most representative of private equity's overall role in the U.S. economy that researchers studying operational outcomes have employed to date.

To better understand the role of employee departures around LBOs, we obtain LinkedIn data from the analytics firm LIX on all employees who ever worked for a subset of the LBO target companies. We restrict this research to the 618 targets in the LBO analysis sample that have both (a) at least five reviews; and (b) current employee reviews before and after the deal. We were able to successfully match 381 firms, and observe LinkedIn profile data for 457,087 employee reviewers at those firms. For each employee, we observe their reported employment years and title. We use this to create a firm-year panel of departure and hiring rates. For example, the departure rate is the number of users reporting a final year of employment in year *t*, divided by the number of users reporting employment at the company in year t.¹⁷

We also gather data on conventional acquisitions from Capital IQ to compare their effects to those of private equity acquisitions. We require M&A transactions to have a public or private corporate buyer and to occur between 2010 and 2016, have a U.S. target, have a value of \$100m or above,¹⁸ and not be LBO,

¹⁶Matched deals are slightly more likely to be public-to-private and less likely to be corporate divestitures, reflecting the difficulty of obtaining high-quality matches to subsidiaries before and after the LBO. Since we focus on companies with employee reviews, our matched deals tend to be larger and have more employees than the typical private equity deal. This focus on companies with meaningful employment is not a problem since we are interested in impacts on employees.

¹⁷Specifically, we calculate the employment change of firm j in year t as the number of LinkedIn users who report working for that firm in year t divided by the number of users who report working for that company in year t - 1, minus one. The hiring rate is the number of users whose first year of employment at that company is year t, divided by the number of users reporting employment at the company in year t - 1.

¹⁸We imposed a \$100m cutoff because there are a very large number of small transactions in the data and we wanted to find

MBO, or bankruptcy transactions. Out of a total of 5,672 deals meeting these requirements, we match 2,040 to Glassdoor.¹⁹ Among these, we eliminate deals in which the acquirer did not take a majority stake or where we do not observe reviews by current employees both before and after the deal. This requires acquired companies to become subsidiaries rather than be subsumed into the acquirer and disappear. As a result, the matched deals tend to be large relative to the average acquisition, which is helpful because it makes them more comparable to the LBO targets. This leads to 1,010 M&A deals in the final analysis sample. Summary statistics on these deals relative are in Appendix Table A.4.

Investor Return Data We gather data on investor returns from Stepstone Group, which has built its SPI database while providing fund-of-fund and advisory services in private markets since 2006. The data comes from performing due diligence and monitoring investments, similar to other sources of deal-level private equity return data that researchers have used (Robinson and Sensoy, 2013; Degeorge, Martin, and Phalippou, 2016; Braun, Jenkinson, and Stoff, 2017). The SPI data include deal-level internal rate of return (IRR) and total value multiple (TVM) as well as cash flow information (i.e., initial investments, follow-ons, interim distributions), observed at no less than quarterly frequency. There is also a granular description of the company's industry and the fund's mandate. Together, this information enables us to compute deal-level PMEs, following Kaplan and Schoar (2005). We calculate PMEs against the industry-specific return indices from the Russell 2000, which we obtain from Bloomberg.

The SPI data have several attractive features. First, Stepstone requires fund managers to report returns from all deals and reconcile them with fund-level performance. This mitigates the bias towards more successful deals that appears in some datasets. Second, the vast majority of targets have Capital IQ identifiers, which allow us to effectively match them the Pitchbook/Glassdoor data. Third, most of the funds have Preqin identifiers, so we can benchmark fund-level net-of-fee performance data against a widely available dataset. Finally, SPI is a large dataset; for the 2005–2017 vintages, 1,296 funds have deal-level information. We match 351 LBOs to SPI (26% of the LBO sample, a proportion broadly consistent with SPI's coverage of the LBO universe). Summary statistics for the matched sample are reported in Panel D of Table 1. Appendix Table A.5 shows that the SPI-matched deals have similar leverage but are more likely to be public-to-private transactions or corporate divestitures than a typical deal

companies that had a reasonable chance of remaining an independent subsidiary, which we need to observe the target postacquisition in Glassdoor.

¹⁹Many of the non-matched targets were oil and gas or real estate properties; indeed, the most frequent target industry in the raw data is Real Estate Operating Companies and essentially none of these match.

in the main LBO sample. The deals' returns range widely and appear representative of both Preqin deals overall and SPI deals in particular.²⁰

ESG Data An increasing number of funds report a focus on ESG. To assess whether these funds have a different relationship with the employees of target firms, we acquired Preqin's ESG module, which includes measures of ESG status for nearly 37,000 private equity funds. We are able to match 48% of the Glassdoor-Pitchbook deals' funds to Preqin's funds, resulting in 59% of the Glassdoor-Pitchbook deals having at least one fund matched to Preqin's funds. We focus on two categories: ESG and the subset of ESG called "Impact." We classify deals according to the fund classification of the lead investor. The ESG category applies to any fund that reports considering environmental, social, or governance factors in its decision-making. The narrower "Impact" category includes funds with explicit investment policies to fund firms with positive social impact.²¹ The Impact label has the stricter requirement that funds provide a formal impact strategy and evidence of compliance. Table 1 Panel C shows that while 13% of the deals in our data are associated with funds that describe themselves as ESG, only 3% are associated with Impact funds.

2 Empirical Approach

We are interested in the causal effect of acquisitions on employee outcomes. There are two main analytical challenges: non-random selection of targets by acquirers and non-random selection of employees into writing reviews. To address the first challenge, we follow the standard in the literature, using a differences-in-differences design and examining whether we observe pre-trends in an event study. To address the second challenge, we construct measures at the company-level and focus on cross-group heterogeneity, both of which mitigate the selection problem, and also directly assess whether we see changes in composition among characteristics of interest.

²⁰For example, their average fund IRR quartile measured against the vintage-by-size peer group determined by Preqin is 2.73, which is slightly higher than if they were randomly drawn from the Preqin universe (which implies 2.5). For within SPI comparisons, we compute two ranks to gauge the matched funds' performance. 'Within Fund' indicates each deal's percentile return (scaled to be between 0 and 1) among all deals in its fund. Similarly, 'Within Quarter' indicates the rank among all deals in SPI transacted in the same quarter by funds with the same target size focus (Large, Medium, or Small). These rank metrics confirm that our matched sample embeds a representative distribution in return outcomes, with a slight bias towards higher-return deals with mean ranks of 0.53-to-0.59. In unreported analysis, we find that our exclusion of secondary buyouts drives this bias. Consistent with prior studies, secondary buyouts have lower average IRRs and multiples for the SPI sample funds. Including secondary funds in our sample reduces the average within-fund IRR rank to exactly 0.50 and the within-quarter IRR rank to 0.53.

²¹According to Preqin, "Preqin defines impact funds as funds in which the firm invests with positive impact as its primary goal. This is defined as having an impact investing policy, or being a member of GIIN and/or IFC OPIM." See Preqin ESG Blog and Preqin ESG Report.

Our main differences-in-differences specification, at the company-quarter level, is presented in Equation 1. The first difference compares targets before and after the acquisition. The second difference compares targets to firms that were never private equity-owned. In all cases, we use only reviews from employees who report working for the firm at the time of their review.²²

$$\bar{Y}_{j,q} = \mathbb{1}(\text{Post Deal}_{j,q})'\beta + \alpha_j + \gamma_{n,q} + \varepsilon_{j,q}.$$
(1)

Here, $\bar{Y}_{j,q}$ is the average of a job satisfaction dimension for company j in industry n in quarter q, such as the average compensation rating given to Dell in 2014Q1. The vector $\mathbb{1}(\text{Post Deal}_{j,q})$ contains four indicators for the acquisition types: M&A, LBO, growth equity (GE), and management buyout (MBO). For example, the indicator variable $\mathbb{1}(\text{Post LBO}_{j,q})$ is one if firm j is private equity-owned in the quarter, and zero if not. The coefficients of interest β capture the relationship between the new ownership and $\bar{Y}_{j,q}$. We include company fixed effects (α_j) and industry-quarter fixed effects using Glassdoor's 25 sectors ($\gamma_{n,q}$) to control for the company, industry, and time period. This model weights all company-quarters equally, regardless of their number of reviews, which allows us to assess the effects of private equity ownership at the deal level.

To examine drivers of the relatively large effect we observe of LBOs, we restrict focus to the $\mathbb{1}(\text{Post LBO}_{j,q})$ indicator. We examine which types of deals and groups of employees explain the results. In some specifications, we split the post-LBO term along deal characteristic lines to separately estimate their effects relative to control firms. The goal here is to see if, for example, there are significant effects for both public-to-private and corporate divestiture deals.

To understand how different types of employees are impacted, we construct company-by-quarter-bycohort average outcomes, $\bar{Y}_{j,q,c}$, and test the interaction of the deal effect, $\mathbb{1}(\text{Post LBO}_{j,q})$, with the cohort characteristic, X_c , while also controlling for the cohort characteristic independently. For example, to study short- vs. long-tenured employees, we create the average outcome (say, the compensation rating) at the company-quarter level separately for the two groups of employees. Then we use the model in Equation (2) to assess the interaction effect, where X_c represents an indicator for whether the group is composed of shortor long-tenured employees and δ , our coefficient of interest, represents the differential effect on that group.

$$\overline{Y}_{j,q,c} = \beta \, \mathbb{1}(\text{Post LBO}_{j,q}) + \delta \, \mathbb{1}(\text{Post LBO}_{j,q}) \times \mathbf{X}_c + \omega \, \mathbf{X}_c + \alpha_j + \gamma_{n,q} + \varepsilon_{j,q,c}.$$
(2)

We also conduct review-level baseline and heterogeneity analysis using versions of Equation (3), which

²²The exception is in Appendix Table A.15, where we consider former employees.

weights large companies more heavily but may better reflect a potential social planner's interest in worker outcomes. This allows us to use the employee characteristics directly (X_i) and obtain greater power. For review *i* in quarter *q* at company *j* in industry *n*, we use the following specification:

$$Y_i = \beta \ \mathbb{1}(\text{Post LBO}_{j,q}) + \delta \ \mathbb{1}(\text{Post LBO}_{j,q}) \times X_i + \omega \ X_i + \alpha_j + \gamma_{n,q} + \varepsilon_i,$$
(3)

We use event studies to test the identifying assumption that target and control companies would continue on parallel trends in the absence of the buyout. We assess whether there are differential pre-trends using figures that plot the coefficients β_s from the following equation:

$$Y_i = \sum_{s \neq -1} \beta_s \, \mathbb{1}(\text{Deal in Quarter } q - s_{j,q,s}) + \alpha_j + \gamma_{n,q} + \varepsilon_i. \tag{4}$$

Here, $\mathbb{1}$ (Deal in Quarter $q - s_{j,q,s}$) is an indicator variable equal to one if a private equity deal occurred s quarters in the past and zero otherwise. We use the quarter before the deal as the omitted coefficient. These models allow us to assess the immediacy of any effects and also test for pre-trends. We use review-level data to ensure we are not artificially smoothing pre-trends by aggregating to the company-quarter level and to exploit the greater power, though the results are similar with company-quarter level event studies.

In a robustness test, we use a matching estimator to construct an alternative control sample that is as similar as possible to the target sample. This helps to ensure that the full sample does not lead to spurious biases due to firms that are extremely different from buyout targets. We match each LBO target company to five never-private equity-owned companies with at least one review in the three years prior to the deal. The matching is based on the founded year, industry, average percent of reviewers with more than three years of tenure, average percent of reviewers in jobs that do not typically require college, and log number of reviews. The last three variables are measured over the most recent three years. We use the Abadie and Imbens (2006) distance metric that weights each dimension by its standard deviation. In Appendix Table A.6 Panel A, we show that our matched sample is broadly similar to the LBO targets, except that the matched sample has broadly higher ex-ante satisfaction ratings. If anything, this should bias the estimation against finding a negative effect of LBOs. Finally, we employ a different method to study the association between ratings and deal returns. This is presented in Section 4.

3 Main Results: Effects of LBOs on Job Quality

We begin in Section 3.1 with average effects of different acquisition types. Shifting to a focus on LBOs, we next present differential effects across employee categories (Section 3.2). We examine the role of employee composition, including layoffs, in Section 3.3. Last, Section 3.4 contains deal heterogeneity results.

3.1 Average Effect

In Table 2, we present the average effects of four transaction types at the company-quarter level on our seven main variables, four of which reflect employee satisfaction with various dimensions of the firm (on one-to-five scales) and three of which reflect reported salaries (in dollars). These models use Equation 1. The independent variables of interest are post-deal indicators, and should be interpreted relative to control firms that are never acquired, not relative to one another. We include industry-quarter and company fixed effects, so neither industry-level time trends, nor time trends in general, nor static characteristics of target companies can explain the coefficients of interest.²³

LBOs have strong negative effects on all four satisfaction dimensions, while the other acquisition types have weaker, mixed, or zero effects. Specifically, we find that employees' satisfaction with compensation declines by 0.083 rating points after a buyout (column (1)). A natural question is what this magnitude effect represents in terms of utility for the employee; is it a large or a small impact on satisfaction? One way to approach this is to compare the effect to a standard deviation in the ratings, since ratings are on a one-to-five scale. This decline represents 7.3% of a standard deviation, indicating that it is an economically meaningful but not extremely large negative effect. A second benchmark dollarizes a unit of satisfaction. To do this, we first construct a within-job title relationship between satisfaction with compensation and pay, which is shown in Appendix Table A.7. Focusing on the model with full controls – fixed effects for job title, company, and industry-quarter – and using total pay, the coefficient in column (6) of 0.62 implies that our negative effect of LBOs on compensation translates to the equivalent loss in compensation satisfaction that accompanies a 12.5% decline in total wages.²⁴

LBOs have a similar negative effect on employee perceptions of the firm's culture (column (3)); to our

²³The sample size differs across columns because some companies have no observations in a given quarter. Generally, more reviewers provide employer ratings than provide salary reports. Our results are robust to considering only reviewers who report all dimensions.

²⁴The coefficient of 0.62 on log total pay means that a 12.5% decrease in pay is associated with a 0.083 decrease in compensation rating points ($\beta ln \frac{100-12.5}{100}$).

knowledge, this offers the first evidence of how private equity affects corporate culture. The negative effects on work-life balance and senior management are slightly smaller (columns (2) and (4)). Surprisingly, we find no effects on pay (columns (5)-(7)). The discrepancy between satisfaction with compensation and reported pay could reflect LBO investors cutting benefits. However, in Appendix Table A.8, we find no effects on benefits ratings either in the whole sample of reviewers who review benefits and in the subsample that also provided a satisfaction review (columns (6)-(7)). In Section 5, we propose a mechanism to explain why, if LBO investors do not reduce pay, we would see a decline in satisfaction with compensation.

The remaining rows of Table 2 report the effects of the other deal types. M&A negatively affects compensation, but with a less precise and smaller magnitude than LBOs. There is a strong negative effect of M&A on senior management ratings, but no effect on work-life balance or culture. MBOs have negative effects on compensation, but no effects on the other three dimensions. Recall that in an MBO, the existing managers of a company purchase a controlling interest in a company with the help of a private equity firm. While leverage increases, management is generally constant, helping to explain the zero effect on senior management. In a growth equity deal, the private equity firm takes a non-majority stake in a company to fund new investment. If the LBO effects are common to any new investment, we expect to see similar results for growth equity, but the bottom row of the table shows that these deals have no effects. Overall, deals characterized by increases in leverage (LBO and MBO) experience the largest declines in satisfaction with compensation. The comparison to M&A allows us to conclude that while LBO effects may partially reflect generic restructuring after an acquisition, a portion of the negative effect on compensation as well as the effects on the non-pecuniary amenities of work-life balance and culture appear specific to LBOs.

In Appendix Table A.9, we present this analysis at the review level and generally find similar results. The skewed firm-size distribution means this review-level model puts most of its weight on the largest firms. Here, there is no effect of M&A transactions on satisfaction with compensation. The effects of LBOs on satisfaction with work-life balance and senior management are smaller and insignificant, suggesting that these results are driven by smaller firms, perhaps where the average reviewer has more contact with top executives at the firm. Having established that LBOs have particular effects on job quality that are not broadly the same as other types of acquisitions, for the remainder of the paper we focus on these deals.

We use Equation (4) to test the key identification assumption that LBO targets were not already on track to experience declines in employee satisfaction. If they were, we expect declines to start before the private equity deal. The results, in Figure 3, contain no pre-trends for any of the four measures. There are clear, persistent decreases in satisfaction in the quarters immediately after the buyout quarter. Consistent with the regressions, the most marked changes are for compensation and culture. Event studies for reported pay also show no pre-trends (Appendix Figure A.2). Despite this evidence, we cannot rule out the possibility that LBOs simply accelerate inevitable declines in employee satisfaction.

3.2 Heterogeneity in Employee Characteristics

In this section, we look at how the effect of LBOs is moderated by employee status within the firm and proxies for the employee skill. First, in Table 3, we compare effects across managers and frontline workers. Note that managers in this context are typically lower- and middle-level managers, not C-suite executives. We find that managers entirely explain the negative effect on work-life balance (column (2)). There is no effect on this dimension for non-managers. For the other satisfaction dimensions, managers are not differentially affected relative to frontline workers. However, we see quite an interesting result when it comes to salary: managers' base pay goes up slightly, by just over 2% (column (5)), but they enjoy a substantial increase in performance pay, on both the intensive (column (6)) and extensive (column (7)) margins. Specifically, they receive 43% higher performance pay and are about five percentage points (18% of the mean) more likely to get any performance pay after a buyout. In Appendix Table A.10, we break down performance pay into its four component categories. The effect is driven by cash bonuses rather than stock or profit sharing. (This does not imply that LBO investors do not adjust stock option compensation for the very top managers, who we do not observe.)

Overall, the results indicate that after LBOs, managers are pushed to work harder but are compensated more generously, particularly via incentive pay. This is consistent with findings by Gompers, Kaplan, and Mukharlyamov (2016) about the importance of incentives in private equity deals. More generally, higher incentive compensation for managers in particular is related to the increase in overall within-firm pay inequality (Piketty, 2013) and also a greater connection between higher and more volatile pay for managers and higher firm productivity (Bloom et al., 2021). Our results suggest that the LBO business model – which has increased its footprint dramatically in the U.S. over the past few decades – may be in part responsible for these trends.

The rise in manager incentive pay raises the possibility that LBOs reduce satisfaction with compensation by increasing within-firm pay inequality (Bandiera, Barankay, and Rasul, 2007; Breza, Kaur, and Shamdasani, 2017). To assess whether this may be the case, we construct three standard measures of

within-firm pay inequality: the standard deviation, 90-10 ratio, and 90-50 ratio, all at the company-quarter level. We first examine whether LBOs increase inequality in either base pay or total pay. Appendix Table A.11 Panel A shows that there is no statistically significant effect within our data, though the coefficients are positive and larger when we include incentive pay. Next we create an indicator for LBOs that have above-median change in inequality. Panel B shows these deals do not have different effects from deals with below-median inequality changes (the interaction coefficients are near-zero and insignificant). Therefore, higher within-firm inequality does not appear to explain the overall decline in satisfaction.

We next consider job tenure, which is related to the degree of entrenchment at the firm. We divide the current employees into those with less than three years and more than three years of tenure at the firm. In Table 4, we show that the results for all four satisfaction dimensions are driven by workers with longer tenure. The coefficients are near zero for short-tenure workers, while long-tenured workers show large negative effects. For example, the negative effect on compensation is over 10% of a standard deviation for long-tenured workers (column (1)). This result is robust to using review level data and, importantly, to controlling for skill. In Appendix Table A.12 Panel A, we report the results at the review level, now exploiting the higher power to consider four tenure categories. We find that in general, the most negative effects are among workers with at least four years of tenure, though there are also significant negative effects among workers with 2-3 years of tenure. In Panel B, we find that these results are essentially unaffected when we include controls for worker education, experience, and manager fixed effects. We continue to find no effects on pay (Table 4 columns (5)-(7)).

Our final employee characteristics are proxies for skill. First, in Table 5 Panel A, we compare effects across jobs that typically require less and more than three years of experience. We find that the negative effects on compensation, culture, and senior management are generally driven by lower-skill workers (columns (1), (3), and (4)), while the negative effect on work-life balance is driven by higher-skill workers (column (2)), consistent with the relationship for managers. We also see an increase in base pay, of about 3%, for higher-skill workers (column (5)), and a positive albeit insignificant coefficient on variable pay. Second, we consider the educational requirements of the job in Panel B. It is very clear from column (1) that the negative effect on satisfaction with compensation is driven by lower-skill workers, while there is no effect among workers in jobs that require a professional degree (note the average effect for these high-skill workers is the effect on the base low-skill group of -.103 plus the coefficient for the high-skill group of 0.111). There is a similar relationship for the other dimensions, though they are much less precise. We

again see that LBO investors increase pay for higher-skilled workers, though it is only significant for base pay, which increases by 3.3% for jobs that require a college degree (column (5)).

In these tables, the independent average effects of the characteristics offer benchmarks for assessing the magnitude of the negative effect of LBOs. For example, on average people in higher-skill jobs are about 0.10 rating points more satisfied with their firm's culture (Table 5 Panels A and B column (3)). Therefore, the average negative effect of LBOs on satisfaction with culture, at -0.09 rating points, represents nearly the average difference in satisfaction with culture associated with an advanced degree or more skill. To provide a second benchmark, this negative effect is about half the average extra satisfaction that managers have with firm culture relative to non-managers (which is 0.2 rating points, from Table 3 column (3)).

In sum, we find that private equity reduces satisfaction with job quality, in particular with compensation and culture. The decline in satisfaction with pay is concentrated among less-skilled, entry-level workers and those who have been at the firm for a longer period. Meanwhile, managers and skilled workers are pushed to work harder, but they enjoy an increase in pay. Managers are much more likely to earn performance pay, and the amount of performance pay increases dramatically, after LBOs. The results suggest that LBOs are bad news only for lower-skill, entrenched workers. Intriguingly, the declines in job quality are *not* accompanied by declines in pay – indeed, higher-skill workers and managers earn more after buyouts – pointing to a more nuanced mechanism than straightforward cost-cutting.

3.3 Employee Composition

It is possible that employee composition changes around LBOs drive our results. In Appendix Figure A.3, we plot changes in our employee characteristics around the time of the deal. These charts show no obvious deal effects, something we confirm in Table A.13. Our company-quarter level analysis further obviates concerns about composition changes along the dimensions we study; for example that fewer managers submit reviews after the buyout and managers are in general correlated with higher ratings. This is because we study the average review for each cohort (e.g. managers vs. non-managers) after vs. before the buyout and relative to the difference across cohorts at control firms.

Another way employee composition may affect our results is via layoffs. Although it is commonly asserted that LBOs are associated with layoffs, there is relatively little evidence of this; Olsson and Tåg (2017) look most directly at layoffs and find that in Sweden, there is no increase in worker unemployment after buyouts. At U.S. manufacturing firms, Davis et al. (2014) also find limited net change in employment

after buyouts. However, Antoni, Maug, and Obernberger (2019) find evidence that of one-time layoffs after buyouts in Germany, with employment declining by about 9%. To understand whether layoffs occur in our setting, we use the novel LinkedIn panel (see Section 1). (Our Glassdoor data are not particularly useful for studying layoffs.²⁵) Specifically, Appendix Figure A.4 Panel A shows that the departure rate dramatically increases in the first year after the buyout and returns to baseline during the second year. There is no increase in the hiring rate (Panel B), and therefore the overall employment growth rate declines (Panel C). These patterns are consistent with immediate, one-time layoffs being part of initial operational changes after an LBO, though we cannot distinguish between voluntary departures and layoffs.

Next, we use three tests to study whether layoffs moderate impacts on employee satisfaction. First, we find that LBOs have no effect on the number of current employee reviews (Appendix Table A.13 column (6)). This points to the Glassdoor data offering a consistent picture of the state of the company, rather than reflecting a surge in reviews after buyouts due to layoffs. A second analysis assesses whether the negative effects on job quality are correlated with high net losses in employees. We define a deal as "high-layoff" if it has an above-median change in the LinkedIn departure rate between the four years prior to and after the deal. The results, in Appendix Table A.14, indicate that high-layoff deals are not statistically different from low-layoff deals. Third, we use data on former employees to gauge the impact of layoffs. Recall that our main analysis does not reflect already laid-off employees because it is restricted to current employees. However, current workers who have been told they will be laid off may have more negative sentiment. This predicts more negative effects among former employees. Panel A of Appendix Table A.15 repeats the main analysis but in the sample of former employees.²⁶ There are negative effects, but they are smaller and weaker than those among current employees from Table 2. This suggests that workers rate their firm honestly and makes it less likely that current-but-soon-to-be-former employees are rating more harshly because they have just been informed that they are being laid off.

In sum, while one-time layoffs appear to occur and may drive some of the negative effects on average satisfaction, they perhaps surprisingly do not appear to have first-order relevance to our findings. To the degree LBOs are accompanied by layoffs, it does not dramatically affect an employee's propensity to review,

²⁵For example, it is possible that even though layoffs do not occur, a fear of layoffs lead more people to look for a job and thus submit reviews on the website, creating an increasing number of reviews even as the number of employees declines. As explained above, our empirical strategy means that such phenomena will not bias our results; we are interested in the average perspectives among those employees who are using Glassdoor. (If fear of layoffs reduces their experience of job quality, this is not a problem for our analysis but rather an important mechanism.)

²⁶To identify former employees, we make use of the employee's job ending year in Glassdoor. When job ending year is missing, we use the year of review.

the effects persist after the one-time layoffs have ended (comparing Figure 3 and Appendix Figure A.4), and they also appear at firms with little layoffs. It remains possible that lower satisfaction stems from a permanent increase in job insecurity. Persistently greater fear of being laid off would represent a mechanism by which worker job quality declines; clearly, job security is an amenity and contributes to employee surplus.

We are separately interested in whether effects are similar among workers hired after the buyout. This sheds light on three interpretations of the main effects. First, LBOs might make a firm a worse place to work through employee-unfriendly operational changes. In this case, we would expect negative effects among both pre-existing employees and new hires, relative to both groups at control firms. Second, new private equity owners might breach the firm's established implicit contracts with employees (Shleifer and Summers, 1988). This channel predicts stronger effects for employees at the firm before the buyout. Finally, a third channel that could co-exist with either of the first two is that operational changes after the buyout might lead different employees to sort into the firm. In this case, satisfaction may remain similar to control firms or even improve among new hires who are a better match with private equity ownership. We compare current employees who started after the private equity deal (new hires) with current employees who started before the deal (pre-deal employees) by interacting the effect of an LBO with whether the employee is hired after the deal in Panel B of Appendix Table A.15, using Equation 3.²⁷ The first row of coefficients documents large negative effects among current employees who were hired before the deal. In contrast, new hires are unaffected, shown in the second row of coefficients. These are significantly positive for all dimensions, indicating that the two groups are significantly different from one another and, since they roughly add to zero, demonstrate no effects among new hires.

In sum, LBOs appear to create value in part by breaching implicit contracts with pre-existing employees. Employees hired after the buyout are not affected, pointing to the importance of matching. Our findings are less consistent with employee-unfriendly operational changes. If these changes are occurring, they have no measurable impact on new hires.

3.4 Deal Attributes

In this section, we study the effects of different types of deals. We modify Equation (1) by separating the independent variable $\mathbb{1}(\text{Post LBO}_{j,q})$ into multiple variables representing different levels of a deal

²⁷We use review date, deal date, and job tenure to determine if an employee is hired after the deal. An employee is a new hire if the distance between the deal date and review date is longer than the job tenure (upper bond in days). We use tenure controls to address any association between tenure and satisfaction.

characteristic. This allows us to interpret the coefficients relative to the base group of non-target control firms (in supplementary tests, we assess whether coefficients are statistically different from one another).

Leverage We first consider leverage, which is a key point of differentiation for LBOs and MBOs relative to M&A and growth equity. We measure leverage as the value of new debt taken on in the deal relative to the deal size; this intuitively allows us to assess the change in job quality (left-hand side of the equation) as a function of the change in debt relative to firm value (right-hand side of the equation). We do not observe total debt so cannot study total leverage; however, this is less interesting because it does not get at the change associated with the buyout.

We present results in Table 6. In Panel A we divide the sample of LBOs around median leverage. We see that the negative effects on job satisfaction are driven by high-leverage deals. This is most extreme for culture, where we see that the effect is zero for below-median leverage deals, and -.14 for above-median leverage deals, which represents 11% of a standard deviation. We also see that the effect is more than twice as large for compensation in high-leverage deals, at 17% of a standard deviation relative to just 6.6% for low-leverage deals. The effects are statistically significant from one another for compensation and work-life balance, but just barely not so for culture (Appendix Table A.16 Panel A). In Figure 4, we repeat the event study analysis but limit the LBO sample to deals with above-median leverage. We clearly see much larger effects relative to Figure 3, particularly for compensation (Panel A) and work-life balance (Panel B).

The effects increase roughly monotonically in leverage. In Panel B of Table 6, we divide the sample into quartiles. The magnitude is consistently lowest for the first quartile, and generally increases, with the negative results driven by the third and fourth quartiles. In Panel C, we show strong negative effects of an interaction with continuous leverage. (In unreported results, we find no effect of a quadratic term.) The last three columns of the table suggest weak evidence of pay increases in low-leverage deals.

Deal Type and Size We examine two other important deal characteristics in Table 7. First, we divide the LBO sample into three transaction types: public-to-private deals, corporate divestitures, and vanilla LBOs. The results, in Panel A, show that the negative effects are of roughly similar magnitude across the three deal types, and except for one, they are not significantly different from one another. The outlier is work-life balance, where corporate divestitures show a negative effect that is more than three times as large as vanilla LBOs. The coefficient of -0.158 represents 14% of a standard deviation (Panel A column (2)) and

is significantly more negative than other LBOs (Appendix Table A.16 Panel B column (2)). Therefore, corporate divestitures are primarily responsible for a large share of the efficiencies in which employees are asked to work harder, and are also the largest source of negative effects on compensation. In these types of deals, employees at the targeted subsidiary may have previously benefited from managers who enjoyed the "quiet life" and suffered from the agency issues inherent in multiunit corporations (Scharfstein and Stein, 2000; Bertrand and Mullainathan, 2003). For example, Schoar (2002) argues that "conglomerates dissipate rents in the form of higher wages."

The next characteristic is deal size. We define small as the bottom two terciles and large as the top tercile, though the results are similar using alternative deal size breakdowns. The results, shown in Table 7 Panel B, indicate that the main effect is robust across both smaller and larger deals. However, there are more adverse effects on culture in smaller deals (column (3)). The effects on satisfaction with work-life balance and senior management are larger among bigger deals (columns (2) and (4)). These results combined with the corporate divestiture results from Panel A support the idea that as firms become larger and more diversified, employees are not required to work as hard, creating opportunities for an external acquirer (Seru, 2014).

ESG and Impact Funds Creating a positive social impact is an increasingly important priority for institutional investors, with the share of managed assets in the U.S. that are under ESG mandates as much as doubling since 2015 to represent \$17 trillion or a third of the total.²⁸ Labor relations are central to the "social" component of ESG (Henisz, Koller, and Nuttall, 2019). We examine whether deals led by funds with ESG or Impact investment mandates show different effects.

We first consider the full set of all ESG funds. As shown in Appendix Table A.17 Panel A, deals led by ESG funds are associated with the same negative effect on employees as other deals. One explanation is that fund ESG status is self-reported and notoriously poorly measured, which can enable funds to label themselves as ESG-oriented even if they are not.²⁹ Regardless, our results indicate that if limited partners wished to screen firms on treating employees well (as measured by the employees' own perceptions), they cannot achieve this by screening only on a broad ESG category. As labor relations become an increasing priority among limited partners, this potentially points to the need for new measures and sources of data.³⁰

²⁸See, for example, this USSIF article.

²⁹See, for example, Howard-Grenville (2021) or this PitchBook article.

³⁰For example, one private equity investor told Pitchbook, as reported in this PitchBook article, that "Sophisticated LPs are now asking tougher questions about a firm's ESG efforts. For GPs, it's no longer enough to just say, 'Oh, we have an ESG policy.'"

We next focus on the Impact indicator, which represents those investment funds that, according to Preqin, require portfolio companies to have a positive impact. In Appendix Table A.17 Panel B, we document that our negative results are driven by non-Impact funds. There is no measurable effect of buyouts on employee satisfaction when the investment fund has an Impact orientation. Although this sample is small and our coefficients imprecise, it points to potential benefits from more stringent screens.

In sum, the average negative results are driven by high-leverage deals, but not by a particular transaction type or deal size. Note that the relationships documented in this section do not imply causality. For example, the different effects by leverage could reflect another deal characteristic associated with high debt. However, the results shed light on which types of deals are better and worse from employees' perspectives.

4 Investor Returns

Financial returns to investors are the main objective of the LBO business model and it is natural to ask how they relate to employee satisfaction. Deal performance could be related to employee satisfaction through several channels. First, if investor returns in private equity come largely from extracting employee surplus, we might see a negative relationship between returns and job quality changes – the more effective private equity is at extracting surplus, the worse workers do. Second, there might be no correlation if private equity firms always extract employee surplus in the same way regardless of the deal success. Finally, we might see a positive relationship if there is a risk-sharing mechanism in which investor successes and failures are passed through to employees, similar to the way that currency exchange rate variation passes through to wages and prices (Gopinath, Itskhoki, and Rigobon, 2010; Bussiere, 2013). Deal performance differs from the other characteristics that we consider because it is determined well after the deal date. Because of that, we do not seek to establish causality here, since the return formation and satisfaction changes occur simultaneously and could both reflect a third variable.³¹

Association within Matched LBOs We first show the raw relationship between returns and job quality changes for the return-matched deals. Figures 5 and 6 plot bin-scatters with satisfaction and pay changes on

³¹We also do not seek to establish the role of private equity manager skill as our small sample and the high degree of randomness in deal-level returns makes that impossible. Korteweg and Sorensen (2017) show that the luck-related variance in buyout fund returns is six times that of the skill-related variance.

the *y*-axis and twenty return quantiles of deal log returns on the *x*-axis.³² They also include a quadratic spline to assess the linearity of the relationship. Each column contains a different rating dimension. We present the results for three measures of returns: IRRs in the first row, TVMs in the second row, and PMEs against the Russell 2000 industry sector index in the third row. Figure 5 shows a generally positive association between investor returns and changes in employee satisfaction, with particularly positive slopes for IRR. Among the rating dimensions, compensation has the strongest positive association. Figure 6 shows that while there is no relationship for base pay (first column), there is a markedly positive slope for variable earnings across all three return measures (second two columns).

Next, we remove company- and time-specific confounders using a simple linear regression model. This does not lead to causal interpretation but documents the residual correlation between investor outcomes and the changes in job quality at the target firm. All firms are private equity targets in the SPI-matched sample, so we do not use the differences-in-differences model as there is no second difference. In order to control for persistent company quality differences, we instead estimate the following equation:

$$\Delta Y_j = \beta \operatorname{Return}_j + \omega \operatorname{X}_j + \eta_t + \varepsilon_j.$$
(5)

 $\Delta \bar{Y}_j$ is company j's change in the post-deal average of the residualized rating minus the pre-deal average, where the residualized rating for a firm-quarter is the firm-quarter average rating adjusted for industryquarter fixed effects. The coefficient of interest β gives the association between returns (e.g. IRR) and average rating changes. The vector X_j controls for the pre-deal average rating (to demean each firm's outcome) and the investment amount. Finally, we include deal year fixed effects, η_t .

In Table 8 Panel A, we present estimates of Equation (5). We focus on IRR, which is the most salient measure of private equity fund performance (Da Rin and Phalippou, 2017) and the most important deal evaluation metric (Gompers, Kaplan, and Mukharlyamov, 2016). Relative to the other measures, the IRR weights early cash flows more heavily and, thus, could be more likely to reflect immediate rent extraction that potentially comes at the cost of longer-term performance drivers, such as job quality. We see a large and robust positive relationship for all satisfaction and pay measures except for base earnings in column (5). For example, a 10% increase in the annualized return is associated with a 7% increase in employee variable pay. Appendix Table A.18 shows the same pattern for the other two return measures: TVM, which captures the total return to investors without any time or risk adjustment (Panel A) and PME, which captures

³²Before calculating the log, we add either one plus the return value for IRR or 0.1 plus the value for TVM and PME.

idiosyncratic returns after accounting for what the comparable public market investments would deliver (Panel B).

We explore whether this pass-through is driven by short- or medium-term satisfaction changes. In Appendix Table A.19 Panel A, we recalculate satisfaction changes to include only the first six months after the deal. In Panel B, we consider the third and fourth years after the deal (25-48 months). In both cases, we include the same data pre-deal. The pass-through to satisfaction with compensation occurs in the medium term, where there is a much larger relationship (Panel B); there is no relationship in the near-term (Panel A). This offers suggestive evidence that the co-movement of returns and satisfaction reflects employees reacting to firm performance long after any initial operational changes.

Overall, it is clear that higher PE investor returns are not associated with larger deteriorations in employee ratings. Instead of a zero-sum reallocation of employee surplus to investors, there instead appears to be a positive relationship, and the deals that are worst for job quality are also worst for investors. At the same time, however, such a positive link is not surprising, because public firms have been shown to exhibit a similar relation (Edmans, 2011). This leads us to ask whether the relationship between financial performance and job quality for private equity-backed firms is different from that in public firms.

Relative to Matched Public Firm Investments The positive association between returns and job quality could be weaker for private equity-backed firms if private equity investors are less capital constrained on the downside and more effective at keeping rents to themselves in the upside. It could also be stronger if private equity firms give more performance pay on the upside and pass more downside to employees through leverage and costly default. We explore these possibilities by creating a set of "mimicking" public companies for each private equity deal. Our approach has two steps. First, we match each LBO target to at most five closest publicly traded peers at the time of the deal.³³ Second, we construct hypothetical investments in public equities that mimic the cash flow pattern of the respective LBOs. We follow Korteweg and Nagel (2016) and assume that amounts of investments in the mimicking deals exactly match those of the actual deals. The interim distributions are determined as a function of the time that has elapsed since the

³³For LBO targets and for each public company at the time of the LBO, we match on year founded, industry, log number of reviews, share of jobs requiring only a high school diploma, and share of reviews by employees with at least three years of tenure. We calculate the final three variables using reviews in the three years prior to the LBO. Appendix Table A.6 Panel B compares the characteristics of these mimicking portfolios with our LBO sample. The matched companies are similar to the targets, importantly on the compensation where we expect to find most evidence of pass-through. They have worse ex-ante ratings on the other dimensions, however. We control for the pre-deal average rating in estimation, which helps to address this. The last three rows of Table 1 Panel D report IRRs, TVMs, and PMEs against the industry-sector index for these LBO-mimicking investments in public firms that are similar to LBO targets.

deal or previous distribution. The mimicking portfolio pays out its residual value on the date of the terminal distribution of the actual deal.³⁴

The purpose of constructing these mimicking cash flows is to "package" public stock returns in private equity-like cash flows and investment durations. Deviating from Korteweg and Nagel (2016), we use the individual stock return in place of market-wide returns. Therefore, these hypothetical cash flows reflect the idiosyncratic return on the asset alongside the systematic risk exposures, just as with a given private equity deal. Using these hypothetical cash flows that reflect the multi-period returns of the respective public equity, we compute the IRRs, TVMs, and PMEs against style and industry sectors, just as we do for the actual LBO sponsor fund cash flows. We can then estimate the following model:

$$\Delta \bar{Y}_j = \beta \operatorname{Return}_j + \delta \mathbb{1}(\operatorname{LBO}_j) \times \operatorname{Return}_j + \gamma \mathbb{1}(\operatorname{LBO}_j) + \omega \operatorname{X}_j + \alpha_d + \varepsilon_j.$$
(6)

The sample in Equation (6) is restricted to LBO targets, for which we observe returns and the matched mimicking portfolios. The coefficient of interest is δ on the interaction between the return measure and being an LBO rather than a mimicking public investment. Each control firm is a separate observation in the regression. We include fixed effects (α_d) for each group of an LBO target and its five mimicking public equity investments. Other variables are as described above.

We present the results in Table 8 Panel B. We focus only on satisfaction outcomes for sample consistency (i.e., not all matched public controls that have ratings have salary reports and *vice versa*) and for statistical power considerations. For each rating dimension, the panel shows results using the log IRR in odd columns and the IRR percentile rank in even columns. The percentile ranks, which we calculate separately within the LBO and mimicking deals samples, help to correct for the effect of return outliers, as well as for the fact that the standard deviation of LBO returns (Panel D of Table 1) is double the level observed for mimicking investments in public equities. Such a large difference in risk can confound the interpretation of the results – e.g., if private equity doubles a firm's leverage, both the firm's equity returns and its employees' fortunes may become more exposed to firm-level shocks. However, because we compute percentile ranks separately for public mimicking deals and LBOs, differences in the average level of risk level do not affect the explanatory variable and therefore should not affect inference about the satisfaction relationship. Nonetheless, the absolute return results are most relevant for indicating what

 $^{^{34}}$ We do not observe the round-by-round valuations and therefore use the whole-fund approach. See Equation (15) in Korteweg and Nagel (2016).

fraction of equity investor welfare is passed through to employees.

The first two rows of coefficients in Table 8 Panel B report the additional passthrough for LBOs. For example, column (1) shows that every 0.25 increase in log IRR is associated with a 0.044 point increase in satisfaction with compensation for the matched public firm sample and a significantly higher 0.092 point increase for the LBO sample. Moving up one IRR quartile is associated with nearly twice as much of an increase in employee satisfaction with compensation for LBO targets (0.11 versus 0.06 for the matched public firms). The relationships for the other dimensions are less robust, consistent with pecuniary compensation being the most relevant mechanism of passthrough. The third and fourth row of coefficients show the relationship between returns and changes in satisfaction for the minicking public investments. They are significantly positive, consistent with previous research. Appendix Figure A.5 confirms this using the simple binscatter approach.³⁵ The independent effect of LBO represents the LBO effect when returns are zero, which is the case for about 15% of investments in the sample. It is strongly negative, with a magnitude more than twice the average LBO effect reported in Table 2. That is, very poor deals for investors are also very poor deals for employees.

In sum, the negative changes in employee satisfaction after buyouts are concentrated in low-performing deals. LBOs exhibit more pass-through of returns to employee satisfaction with compensation than publicly traded firms (though they have a lower average), consistent with rent-sharing theories. This could arise from more use of explicit performance-based employment contracts, or could reflect another mechanism. While these correlations shed light on how private equity creates value, we reiterate that there is no sense of causal determination.

5 Mechanism Discussion

Overall, our evidence that job quality declines after LBOs for pre-existing employees suggests that the new owners breach established implicit contracts with employees (Shleifer and Summers, 1988). As we look towards a mechanism, a number of key results stand out: First, the effects do not entirely reflect standard post-acquisition restructuring because they are not similar for M&A transactions. Second, there are no

³⁵In unreported results, we find similar interactions for TVM but weaker ones for PME. Also, we do not find a statistically significant difference in the pay passthrough of return for LBOs when compared to public companies – the interaction coefficient is positive but is only about half of one standard error.

effects on average reported pay, while incentive pay for managers increases. Relatedly, the effects persistent after layoffs have subsided and are similar in low-layoff and high-layoff deals. Finally, the effects are driven by high-leverage deals, but not by deals of a particular size or corporate type (e.g. public-to-private).

Our first approach to understanding the mechanisms is to examine what reviewers say is happening. We search reviewer comments for words describing reasons for post-LBO satisfaction declines: uncertainty, cost-cutting, and layoffs. We construct indicator variables for a review mentioning each of these concepts.³⁶ Summary statistics about these variables are in Appendix Table A.20 Panel A. The regression results, in Appendix Table A.20 Panel B, show a robust positive effect on usage of all three words. The event studies are in Appendix Figure A.6. Panel A shows that uncertainty spikes in the first year after the buyout but then returns to baseline. In contrast, cost-cutting and layoffs remain persistently elevated (Panels B-C). These results suggest that workers' satisfaction with their compensation as well as their perception of firm culture suffers because they face greater job insecurity. While job insecurity may make them view everything about the firm more negatively (essentially, imposing a "halo" effect on all dimensions, a problem in survey data originally described by Thorndike (1920)), this is observationally equivalent to the employee requiring a compensating differential in their pay after an increase in job insecurity.

This idea of a compensating differential for higher job insecurity ties to an important role for leverage. The most robust deal-level predictor of negative changes in employee satisfaction is high leverage. Moreover, this does not reflect a correlation between leverage and layoffs. Appendix Table A.21 shows this by triple interacting the Post LBO variable with High Layoff and High Leverage. As above, relative to the base category of Post LBO, there is no additional effect of Post LBO*High Layoff. Instead, the coefficient on Post LBO*High Leverage is large in magnitude and statistically significantly more negative than the base category. When we add the third interaction with High Layoff in the bottom row, there is no further negative relationship. Thus, it appears that there is something about leverage independently that drives our effects. Below we posit a particular channel through which leverage affects satisfaction, but this first assertion is more general and agnostic about the channel and even the direction of causality. It is nonetheless important because leverage represents a key component of the LBO playbook and is a

³⁶Layoff means the text contains one of layoff, layoffs, lay-off, laid-off, or lay-offs. Cost cutting means the text contains one of cost cutting or cost-cutting. Risk means the text contains one of: risky or risk or risk-taking. To locate these words, we consider text in the "cons" and "advice to management" sections. Other sections tend not to contain these words and when they do, they tend to be contextually incorrect. We exclude reviews that are less than 100 characters. Unfortunately, we could not consider leverage because the words associated with this (such as debt or leverage) are too frequently used in other contexts, such as "have a great debt to" or "leverage the synergies."

distinguishing feature relative to growth equity and M&A deals, where we find little or no effects. Debt offers tax advantages and aligns incentives, which are central to value creation in private equity (Kaplan and Stromberg, 2009); for example, Guo, Hotchkiss, and Song (2011) find that outsize returns in post-1980s buyouts have come more from leverage rather than cash flow gains.

Leverage is linked to pay – and thus employee satisfaction with pay – because of the connection between unemployment risk and capital structure. Higher leverage increases the chances of firm distress or even bankruptcy, which lead to layoffs, which in turn impose large costs on workers, who are not fully insured and face large switching costs to find an equivalent job (Cantor et al., 1990; Asquith, Gertner, and Scharfstein, 1994; Sharpe, 1994). Atanassov and Kim (2009) show that firms in distress commonly use layoffs as a restructuring measure in countries with strong investor protection and weak labor protection laws, of which the U.S. is a prime example. In exchange for higher risk of unemployment, workers demand compensating wage differentials (Abowd and Ashenfelter, 1981; Hamermesh and Wolfe, 1990). A rich theoretical and empirical literature suggests this logic helps explain capital structure. Theoretically, Titman (1984), Chang (1992), and Berk, Stanton, and Zechner (2010) show that since financial distress – in particular firm liquidation - is costly to workers, firms should choose a debt level below that which maximizes the firm's financial value. Empirical work in support of this view includes Chemmanur, Cheng, and Zhang (2013), Agrawal and Matsa (2013), and Simintzi, Vig, and Volpin (2015). The latter two papers show that when employees face higher costs to being laid off or have more bargaining power, firm leverage declines. Our results are consistent with these predictions but in the opposite direction: As firms increase leverage but keep pay constant, employees' perceived job quality declines.³⁷

In particular, our results align well with the theory in Berk, Stanton, and Zechner (2010). In their model, the firm pays a risk-averse worker a wage that never falls unless the firm is in distress, but rises with good news about worker productivity (following Harris and Holmstrom (1982)). This leads to entrenchment where workers are on average paid above the competitive market wage. Importantly, the employee's surplus is positively related to her tenure. If the firm is liquidated, the worker must take a large pay cut in her new job. When the firm takes on more debt and thereby increases the chance of liquidation, the firm compensates

³⁷A different strand of literature argues that firms increase leverage to extract wage concessions from labor (usually in a unionized context), including Bronars and Deere (1991), Perotti and Spier (1993), Matsa (2010), Bae, Kang, and Wang (2011), Benmelech, Bergman, and Enriquez (2012), and Michaels, Beau Page, and Whited (2019). This strategic view of leverage is less relevant to our setting. In an LBO, the chance of distress in the immediate aftermath of the transaction likely does not increase (in fact it more likely declines). While the target firm is much more levered, it also now has an owner with potentially deep pockets and that is usually doing some investment to improve efficiency and create value over the following years (Boucly, Sraer, and Thesmar, 2011).

workers for risk by raising pay. This key link assumes that labor market imperfections offer workers some bargaining power. In turn, higher labor costs lead the firm to have below-optimal debt, which leads to a persistent clientele effect where some firms have sub-optimally low leverage and attract particularly risk-averse employees. The Berk, Stanton, and Zechner (2010) theory as well as the other work cited above rely on firms upholding an implicit contract between shareholders and workers. LBO investors may exploit an arbitrage opportunity: With the decline in unions and labor power generally, modern labor markets may not require firms to abide by the implicit contract. Previously, the firm may have done so because incumbent managers and shareholders faced some inertia or enjoyed private benefits from employee welfare. LBO investors may target firms that are under-levered from the perspective of the tax benefits of debt, lever them up, but not increase pay as the implicit contract would require.

Four main predictions of this story are borne out in the data. First, the model predicts that higher leverage should lead to higher wages. This explains why in our data, workers are dissatisfied after large increases in leverage with no pay raise. Second, the model predicts that effects should increase in tenure due to entrenchment, which we find. Third, the model predicts that employee-firm matching on risk aversion should mean no effect for new hires, which we also find. Fourth, the model predicts that effects should be most severe among workers facing higher costs of finding a new job. Consistent with this, we find that unskilled workers are most adversely affected. They likely face higher costs from liquidation if they are losers in the changing economy, facing pressure from automation and the rise of gig labor. We take one more step in this direction, which is to show that our effects are stronger when the industry has a higher unemployment rate. Table 9 shows that the effects on compensation (column(1)) and culture (column (3)) are twice as large in industry-years with above-median unemployment.³⁸

It is important to add the caveat that since leverage is endogenous, this mechanism is fundamentally speculative. That said, our approach is in line with previous literature, which has shown only correlations between employment or pay and leverage. The few examples of exogenous variation, such as Agrawal and Matsa (2013) and Simintzi, Vig, and Volpin (2015), come from the side of worker bargaining power, not leverage (which could be related to worker bargaining power through other channels). It is also worth noting that one way our analysis is differentiated from the existing literature on the relationship between capital structure and labor is that we take the perspective of the employee responding to a change in leverage, while

³⁸Data on unemployment are at the NAICS 3-digit year level, which we match manually to Glassdoor industries. The data are from the U.S. Bureau of Labor Statistics.

a commonality of the diverse existing literature is a focus on the firm's perspective, examining how the firm reacts to worker demands.

5.1 Robustness Tests of the Main Results

In this section, we begin by presenting five robustness tests of the results in Table 2. First, we report results from the matching estimation in Appendix Table A.22 and find similar results to the main model.³⁹ Our matching is based on company founding date, industry, size, and worker education and tenure (as described in Section 2) and these tests help further alleviate concerns about selection bias.

Second, recall that each review does not necessarily include ratings on all four dimensions. In Appendix Table A.23, we show that the results are very similar to those in our main table when we restrict the sample to reviewers who rate the company on all dimensions. Third, in Appendix Table A.24 we show that the results are robust to requiring a company to have at least 30 reviews in total during our sample period. This ensures that the results do not reflect firms with small numbers of reviews. Fourth, in Appendix Table A.25 Panel A we cluster standard errors by quarter rather than by company, which leads to more precise estimates than in our main table. Fifth, in Appendix Table A.25 Panel B, the dependent variables are the median rather than average rating for each dimension. The estimates are very similar to those in the main table.

Next, we conduct a series of tests to ensure our findings are not spurious artifacts of some aspect of sample or model construction. A concern raised in Section 3.3 is that employee composition may be an omitted variable explaining the heterogeneity results. Based on the fact that we find no changes in employee composition along our variables of interest (Appendix Table A.13 and Appendix Figure A.3), this does not seem to be a problem. In unreported tests, we control for five aspects of employee composition in our deal-and company-level analysis and find that while the sample size is reduced, the results are robust to including all of the measures or any subset.⁴⁰ Therefore, it does not seem that the employee heterogeneity factors we study in Section 3.2 explain the results, though of course, other features may explain the correlations that we observe with deal type, size, and leverage.

We might be concerned that the returns analysis, which uses only a subsample of deals that can be

³⁹We do not do this exercise for the pay data because its sample is smaller and thus requires different matching, and we find no average effects on pay.

⁴⁰Specifically, we add five continuous controls for the percent of reviews in each company-quarter by employees who report the following characteristics: a tenure of less than three years, a job title that indicates the employee is a manager, a job title that typically requires Masters or Professional degrees, a job title that typically requires above-median work experience, and a location in the company headquarter's MSA.

matched to the Stepstone data, might be based on a set of deals with non-representative effects. Therefore, in Appendix Table A.26, we restrict the analysis to the sample matched to returns data, and continue to find strong effects. At the company-quarter level, the magnitudes are somewhat larger than our main effects (Panel A). Another sample construction concern might be that our results reflect the aftermath of the financial crisis. In Appendix Table A.27, we show that the results are similar when using only deals that took place after 2013. This helps address both concerns about lower completeness for the early part of the sample and the possibility that private equity deals in the wake of the financial crisis were systematically different.

Finally, we examine the rating dimensions that we do not use in our main analysis, because they are either sparsely populated or highly correlated with our main variables. These are Career Opportunities, Recommend this Company, Business Outlook, and Approves of CEO. The second and fourth are binary measures (the reviewer answers Yes or No). The third has answers including negative, neutral, and positive, where we convert them into -1, 0, and 1, respectively. We also exclude Overall Rating because it is not a specific dimension of job quality and it correlates closely with the sum of the four dimensions we study. Panel A of Appendix Table A.8 contains summary statistics on these additional dimensions. Panel B shows the effect of private equity buyouts on employee satisfaction on these additional rating dimensions. We find robust negative effects on all outcomes except for benefits, which was discussed above.

6 Conclusion

This paper offers the first analysis, to our knowledge, of the effect of private equity buyouts on job quality as perceived by employees. One view is that LBOs will improve job quality either as a consequence of increased productivity or because employee morale itself generates investor value. An alternative view is that if operational changes include cost cutting and increased uncertainty, investor returns could come at the expense of employee satisfaction. Policymakers have sought to address such negative effects; for example, several U.S. Senators proposed a bill in 2019 that would prioritize worker pay after private equity-owned companies shut down operations.⁴¹

This paper makes progress towards reconciling the two views. Consistent with the second view, we show that employee satisfaction declines on average following LBOs, with satisfaction with compensation and culture showing the strongest negative effects. Long-tenure and lower-skill workers are most adversely

⁴¹See this Senate Press Release
affected, particularly when it comes to satisfaction with compensation. One-time layoffs do not fully explain the effects, but high-leverage deals are robustly correlated with them. Our results suggest that heightened uncertainty about job loss plays an important role in explaining the effects, in part because greater leverage increases the risk of medium-term insolvency. These effects broadly support the second more negative view.

Our results become more nuanced when we assess pay and investor returns. In contrast to a narrative of broad-based cost-cutting, we find no effects on average pay. In fact, managers enjoy increases in earnings, particularly performance pay. In the first linkage between operational effects of private equity buyouts and investor returns, we show a positive association between changes in employee satisfaction and higher returns, particularly for compensation. This pass-through appears greater than for comparable mimicking public equity investments. While multiple forces are likely at play, these results are consistent with some rent-sharing. That is, although LBOs reduce satisfaction on average, employees share in the success when the deal goes well. These results suggest that parts of the first view play out in the data as well.

Overall, this paper sheds new light on how private equity affects the nature of the firm, pushing beyond the existing literature on employment, separations, and wages. LBOs appear to reallocate rents away from more replaceable and entrenched employees and achieve better matches with new hires. Our results point to a need for further research on how ownership type affects employees, potentially using alternative measures of culture and comprehensive measures of compensation.

References

- Abadie, Alberto and Guido W Imbens. 2006. "Large Sample Properties of Matching Estimators for Average Treatment Effects." Econometrica, 74 (1):235–267.
- Abowd, John M. and Orley C. Ashenfelter. 1981. "Anticipated Unemployment, Temporary Layoffs, and Compensating Wage Differentials." In <u>Studies in Labor Markets</u>, NBER Chapters. National Bureau of Economic Research, Inc, 141–170.
- Acharya, Viral V, Oliver F Gottschalg, Moritz Hahn, and Conor Kehoe. 2013. "Corporate Governance and Value Creation: Evidence from Private Equity." Review of Financial Studies, 26 (2):368–402.
- Agrawal, Ashwini and Prasanna Tambe. 2016. "Private Equity and Workers' Career Paths: The Role of Technological Change." Review of Financial Studies, 29 (9):2455–2489.
- Agrawal, Ashwini K and David A Matsa. 2013. "Labor Unemployment Risk and Corporate Financing Decisions." Journal of Financial Economics, 108 (2):449–470.
- Ang, Andrew, Bingxu Chen, William N Goetzmann, and Ludovic Phalippou. 2018. "Estimating Private Equity Returns from Limited Partner Cash Flows." Journal of Finance, 73 (4):1751–1783.
- Antoni, Manfred, Ernst Maug, and Stefan Obernberger. 2019. "Private Equity and Human Capital Risk." Journal of Financial Economics, 133 (3):634–657.
- Asquith, Paul, Robert Gertner, and David Scharfstein. 1994. "Anatomy of Financial Distress: An Examination of Junk-bond Issuers." Quarterly Journal of Economics, 109 (3):625–658.
- Atalay, Enghin, Phai Phongthiengtham, Sebastian Sotelo, and Daniel Tannenbaum. 2020. "The Evolution of Work in the United States." American Economic Journal: Applied Economics, 12 (2):1–34.
- Atanassov, Julian and E Han Kim. 2009. "Labor and Corporate Governance: International Evidence from Restructuring Decisions." Journal of Finance, 64 (1):341–374.
- Axelson, Ulf, Tim Jenkinson, Per Strömberg, and Michael S Weisbach. 2013. "Borrow Cheap, Buy High? The Determinants of Leverage and Pricing in Buyouts." Journal of Finance, 68 (6):2223–2267.
- Bae, Kee-Hong, Jun-Koo Kang, and Jin Wang. 2011. "Employee Treatment and Firm Leverage: A Test of the Stakeholder Theory of Capital Structure." Journal of Financial Economics, 100 (1):130–153.
- Bandiera, Oriana, Iwan Barankay, and Imran Rasul. 2007. "Incentives for managers and inequality among workers: Evidence from a firm-level experiment." The Quarterly Journal of Economics, 122 (2):729–773.
- Barber, Brad M, Adair Morse, and Ayako Yasuda. 2021. "Impact Investing." Journal of Financial Economics, 139 (1):162–185.
- Bena, Jan and Kai Li. 2014. "Corporate Innovations and Mergers and Acquisitions." Journal of Finance, 69 (5):1923–1960.
- Benmelech, Efraim, Nittai K Bergman, and Ricardo J Enriquez. 2012. "Negotiating with Labor under Financial Distress." Review of Corporate Finance Studies, 1 (1):28–67.
- Berk, Jonathan B, Richard Stanton, and Josef Zechner. 2010. "Human Capital, Bankruptcy, and Capital Structure." Journal of Finance, 65 (3):891–926.
- Bernstein, Shai, Josh Lerner, Morten Sorensen, and Per Strömberg. 2017. "Private Equity and Industry Performance." Management Science, 63 (4):1198–1213.
- Bernstein, Shai and Albert Sheen. 2016. "The Operational Consequences of Private Equity Buyouts: Evidence from the Restaurant Industry." Review of Financial Studies, 29 (9):2387–2418.
- Bertrand, Marianne and Sendhil Mullainathan. 2003. "Enjoying the Quiet Life? Corporate Governance and Managerial Preferences." Journal of Political Economy, 111 (5):1043–1075.
- Bloom, Nicholas, Scott Ohlmacher, Cristina Tello-Trillo, Melanie Wallskog et al. 2021. "Pay, Productivity and Management." Available at SSRN 3944425.
- Bloom, Nicholas, Raffaella Sadun, and John Van Reenen. 2015. "Do Private Equity Owned Firms Have Better Management Practices?" American Economic Review, 105 (5):442–46.
- Boucly, Quentin, David Sraer, and David Thesmar. 2011. "Growth LBOs." Journal of Financial Economics,

102 (2):432–453.

- Braun, Reiner, Tim Jenkinson, and Ingo Stoff. 2017. "How Persistent Is Private Equity Performance? Evidence from Deal-level Data." Journal of Financial Economics, 123 (2):273–291.
- Breza, Emily, Supreet Kaur, and Yogita Shamdasani. 2017. "The morale effects of pay inequality." <u>The</u> Quarterly Journal of Economics, 133 (2):611–663.
- Bronars, Stephen G and Donald R Deere. 1991. "The Threat of Unionization, the Use of Debt, and the Preservation of Shareholder Wealth." Quarterly Journal of Economics, 106 (1):231–254.
- Bussiere, Matthieu. 2013. "Exchange Rate Pass-through to Trade Prices: The Role of Nonlinearities and Asymmetries." Oxford Bulletin of Economics and Statistics, 75 (5):731–758.
- Cantor, Richard et al. 1990. "Effects of Leverage on Corporate Investment and Hiring Decisions." <u>Federal</u> Reserve Bank of New York Quarterly Review, 15 (2):31–41.
- Card, David, Ana Rute Cardoso, Jörg Heining, and Patrick Kline. 2018. "Firms and Labor Market Inequality: Evidence and Some Theory." Journal of Labor Economics, 36 (S1):S13–S70.
- Chang, Chun. 1992. "Capital Structure as an Optimal Contract between Employees and Investors." Journal of Finance, 47 (3):1141–1158.
- Chemmanur, Thomas J, Yingmei Cheng, and Tianming Zhang. 2013. "Human Capital, Capital Structure, and Employee Pay: An Empirical Analysis." Journal of Financial Economics, 110 (2):478–502.
- Chemmanur, Thomas J, Harshit Rajaiya, and Jinfei Sheng. 2019. "How Does Online Employee Ratings Affect External Firm Financing? Evidence from Glassdoor." Available at SSRN 3507695.
- Cohn, Jonathan, Nicole Nestoriak, and Malcolm Wardlaw. 2021. "Private Equity Buyouts and Workplace Safety." Review of Financial Studies.
- Cornelli, Francesca and Oğuzhan Karakaş. 2012. "Corporate Governance of LBOs: The Role of Boards." Available at SSRN 1875649.
- Cremers, KJ Martijn, Vinay B Nair, and Kose John. 2009. "Takeovers and the Cross-section of Returns." Review of Financial Studies, 22 (4):1409–1445.
- Da Rin, Marco and Ludovic Phalippou. 2017. "The Importance of Size in Private Equity: Evidence from a Survey of Limited Partners." Journal of Financial Intermediation, 31:64–76.
- Davis, Steven J, John Haltiwanger, Kyle Handley, Ron Jarmin, Josh Lerner, and Javier Miranda. 2014. "Private Equity, Jobs, and Productivity." <u>American Economic Review</u>, 104 (12):3956–90.
- Degeorge, Francois, Jens Martin, and Ludovic Phalippou. 2016. "On Secondary Buyouts." Journal of Financial Economics, 120 (1):124–145.
- Dessaint, Olivier, Andrey Golubov, and Paolo Volpin. 2017. "Employment Protection and Takeovers." Journal of Financial Economics, 125 (2):369–388.
- Eaton, Charlie, Sabrina T Howell, and Constantine Yannelis. 2020. "When Investor Incentives and Consumer Interests Diverge: Private Equity in Higher Education." <u>Review of Financial Studies</u>, 33 (9):4024–4060.
- Edmans, Alex. 2011. "Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices." Journal of Financial Economics, 101 (3):621–640.
- Edmans, Alex, Lucius Li, and Chendi Zhang. 2014. "Employee Satisfaction, Labor Market Flexibility, and Stock Returns around the World." National Bureau of Economic Research.
- Eriksson, Tor and Nicolai Kristensen. 2014. "Wages or Fringes? Some Evidence on Trade-offs and Sorting." Journal of Labor Economics, 32 (4):899–928.
- Ewens, Michael, Arpit Gupta, and Sabrina T Howell. 2021. "Local Journalism under Private Equity Ownership." Available at SSRN 3939405.
- Fang, Lily, Jim Goldman, and Alexandra Roulet. 2021. "Private Equity and Pay Gaps inside the Firm." Available at NBER Conference f149062.
- Fracassi, Cesare, Alessandro Previtero, and Albert W Sheen. 2021. "Barbarians at the Store? Private Equity, Products, and Consumers." Journal of Finance.

- Franzoni, Francesco, Eric Nowak, and Ludovic Phalippou. 2012. "Private Equity Performance and Liquidity Risk." Journal of Finance, 67 (6):2341–2373.
- Gompers, Paul, Steven N. Kaplan, and Vladimir Mukharlyamov. 2016. "What Do Private Equity Firms Say They Do?" Journal of Financial Economics, 121 (3):449–476.
- Gopinath, Gita, Oleg Itskhoki, and Roberto Rigobon. 2010. "Currency Choice and Exchange Rate Pass-through." American Economic Review, 100 (1):304–36.
- Gorton, Gary B and Alexander K Zentefis. 2020. "Corporate Culture as a Theory of the Firm." <u>National</u> Bureau of Economic Research.
- Graham, John R, Campbell R Harvey, Jillian Popadak, and Shivaram Rajgopal. 2017. "Corporate Culture: Evidence from the Field." National Bureau of Economic Research.
- Green, T Clifton, Ruoyan Huang, Quan Wen, and Dexin Zhou. 2019. "Cowdsourced Employer Reviews and Stock Returns." Journal of Financial Economics, 134 (1):236–251.
- Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2015. "The Value of Corporate Culture." Journal of Financial Economics, 117 (1):60–76.
- Guo, Shourun, Edith S Hotchkiss, and Weihong Song. 2011. "Do Buyouts (still) Create Value?" Journal of Finance, 66 (2):479–517.
- Gupta, Atul, Sabrina T Howell, Constantine Yannelis, and Abhinav Gupta. 2021. "Does Private Equity Investment in Healthcare Benefit Patients? Evidence from Nursing Homes." <u>National Bureau of</u> Economic Research.
- Hamermesh, Daniel S and John R Wolfe. 1990. "Compensating Wage Differentials and the Duration of Wage Loss." Journal of Labor Economics, 8 (1, Part 2):S175–S197.
- Harris, Milton and Bengt Holmstrom. 1982. "A Theory of Wage Dynamics." <u>The Review of Economic</u> Studies, 49 (3):315–333.
- Harris, Robert S, Tim Jenkinson, and Steven N Kaplan. 2014. "Private Equity Performance: What Do We Know?" Journal of Finance, 69 (5):1851–1882.
- Henisz, Witold, Tim Koller, and Robin Nuttall. 2019. "Five Ways That ESG Creates Value." <u>Mckinsey</u> Quarterly.
- Hicks, John R. 1935. "Annual Survey of Economic Theory: The Theory of Monopoly." <u>Econometrica</u>: Journal of the Econometric Society:1–20.
- Howard-Grenville, Jennifer. 2021. "ESG Impact Is Hard to Measure- But It's Not Impossible." <u>Harvard</u> Business Review.
- Huang, Kelly, Meng Li, and Stanimir Markov. 2020. "What Do Employees Know? Evidence from a Social Media Platform." Accounting Review, 95 (2):199–226.
- Jensen, Michael C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." <u>American</u> Economic Review, 76 (2):323–329.
- John, Kose, Anzhela Knyazeva, and Diana Knyazeva. 2015. "Employee Rights and Acquisitions." Journal of Financial Economics, 118 (1):49–69.
- Kaplan, Steven. 1989. "The Effects of Management Buyouts on Operating Performance and Value." Journal of Financial Economics, 24 (2):217–254.
- Kaplan, Steven N and Antoinette Schoar. 2005. "Private Equity Performance: Returns, Persistence, and Capital Flows." Journal of Finance, 60 (4):1791–1823.
- Kaplan, Steven N and Per Stromberg. 2009. "Leveraged Buyouts and Private Equity." Journal of Economic Perspectives, 23 (1):121–46.
- Karabarbounis, Marios and Santiago Pinto. 2018. "What Can We Learn from Online Wage Postings? Evidence from Glassdoor." Economic Quarterly, (4Q):173–189.
- Korteweg, Arthur and Stefan Nagel. 2016. "Risk-adjusting the Returns to Venture Capital." Journal of Finance, 71 (3):1437–1470.
- Korteweg, Arthur and Morten Sorensen. 2017. "Skill and Luck in Private Equity Performance." Journal of

Financial Economics, 124 (3):535–562.

- Lamadon, Thibaut, Magne Mogstad, and Bradley Setzler. 2019. "Imperfect Competition, Compensating Differentials and Rent Sharing in the US Labor Market." National Bureau of Economic Research.
- Lazear, Edward P. 1998. Personnel Economics for Managers. Wiley New York.
- Lee, Yoojin, Shaphan Ng, Terry J Shevlin, and Aruhn Venkat. 2020. "The Effects of Tax Avoidance News on Employee Perceptions of Managers and Firms: Evidence from Glassdoor.com Ratings." <u>Accounting</u> Review, Forthcoming.
- Lerner, Josh and Antoinette Schoar. 2004. "The Illiquidity Puzzle: Theory and Evidence from Private Equity." Journal of Financial Economics, 72 (1):3–40.
- Lerner, Josh, Morten Sorensen, and Per Strömberg. 2011. "Private Equity and Long-run Investment: The Case of Innovation." Journal of Finance, 66 (2):445–477.
- Levit, Doron and Nadya Malenko. 2016. "The Labor Market for Directors and Externalities in Corporate Governance." Journal of Finance, 71 (2):775–808.
- Lins, Karl V, Henri Servaes, and Ane Tamayo. 2017. "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis." <u>Journal of Finance</u>, 72 (4):1785– 1824.
- Liu, Tim, Christos Makridis, Paige Ouimet, and Elena Simintzi. 2019. "The Distribution of Non-wage Benefits: Maternity Benefits and Gender Diversity." Available at SSRN 3088067.
- Maksimovic, Vojislav and Gordon Phillips. 2008. "The Industry Life Cycle, Acquisitions and Investment: Does Firm Organization Matter?" Journal of Finance, 63 (2):673–708.
- Marinescu, Ioana, Nadav Klein, Andrew Chamberlain, and Morgan Smart. 2018. "Incentives Can Reduce Bias in Online Employer Reviews." Academy of Management Proceedings, 2018 (1):11189.
- Martellini, Paolo, Todd Schoellman, and Jason Sockin. 2021. "Alma Mater Matters: College Quality, Talent, and Development." Talent, and Development (August 1, 2021).
- Mas, Alexandre and Amanda Pallais. 2017. "Valuing Alternative Work Arrangements." <u>American Economic</u> Review, 107 (12):3722–59.
- Matsa, David A. 2010. "Capital Structure as a Strategic Variable: Evidence from Collective Bargaining." Journal of Finance, 65 (3):1197–1232.
- Michaels, Ryan, T Beau Page, and Toni M Whited. 2019. "Labor and Capital Dynamics under Financing Frictions." Review of Finance, 23 (2):279–323.
- Morris, Peter and Ludovic Phalippou. 2020. "Thirty Years after Jensen's Prediction: Is Private Equity a Superior Form of Ownership?" Oxford Review of Economic Policy, 36 (2):291–313.
- Olsson, Martin and Joacim Tåg. 2017. "Private Equity, Layoffs, and Job Polarization." Journal of Labor Economics, 35 (3):697–754.
- Pagano, Marco and Paolo F Volpin. 2005. "Managers, Workers, and Corporate Control." Journal of Finance, 60 (2):841–868.
- Perotti, Enrico C and Kathryn E Spier. 1993. "Capital Structure as a Bargaining Tool: The Role of Leverage in Contract Renegotiation." American Economic Review:1131–1141.
- Piketty, Thomas. 2013. Capital in the Twenty-first Century. Harvard University Press.
- Pontiff, Jeffrey, Andrei Shleifer, and Michael S Weisbach. 1990. "Reversions of Excess Pension Assets after Takeovers." Rand Journal of Economics, 21 (4):600–613.
- Robinson, David T and Berk A Sensoy. 2013. "Do Private Equity Fund Managers Earn Their Fees? Compensation, Ownership, and Cash Flow Performance." <u>Review of Financial Studies</u>, 26 (11):2760– 2797.
- ———. 2016. "Cyclicality, Performance Measurement, and Cash Flow Liquidity in Private Equity." <u>Journal</u> of Financial Economics, 122 (3):521–543.
- Scharfstein, David S and Jeremy C Stein. 2000. "The Dark Side of Internal Capital Markets: Divisional Rent-seeking and Inefficient Investment." Journal of Finance, 55 (6):2537–2564.

- Schoar, Antoinette. 2002. "Effects of Corporate Diversification on Productivity." Journal of Finance, 57 (6):2379–2403.
- Seru, Amit. 2014. "Firm Boundaries Matter: Evidence from Conglomerates and R&D Activity." Journal of Financial Economics, 111 (2):381–405.
- Sharpe, Steven A. 1994. "Financial Market Imperfections, Firm Leverage, and the Cyclicality of Employment." American Economic Review, 84 (4):1060–1074.
- Sheng, Jinfei. 2019. "Asset Pricing in the Information Age: Employee Expectations and Stock Returns." Available at SSRN 3321275.
- Shleifer, Andrei and Lawrence H Summers. 1988. "Breach of Trust in Hostile Takeovers." In Corporate Takeovers: Causes and Consequences. University of Chicago Press, 33–68.
- Simintzi, Elena, Vikrant Vig, and Paolo Volpin. 2015. "Labor Protection and Leverage." <u>Review of Financial</u> Studies, 28 (2):561–591.
- Sockin, Jason and Michael Sockin. 2019. "A Pay Scale of Their Own: Gender Differences in Performance Pay." Available at SSRN 3512598.

——. 2021. "Performance Pay and Risk Sharing between Firms and Workers." Available at SSRN 3774639.

- Sockin, Jason and Aaron Sojourner. 2020. "What's the Inside Scoop? Challenges in the Supply and Demand for Information about Job Attributes." Available at SSRN 3596666.
- Stole, Lars A and Jeffrey Zwiebel. 1996. "Organizational Design and Technology Choice under Intrafirm Bargaining." American Economic Review, 86 (1):195–222.
- Thorndike, E.L. 1920. "A Constant Error on Psychological Rating." Journal of Applied Psychology, 4 (1):25–29.
- Titman, Sheridan. 1984. "The Effect of Capital Structure on a Firm's Liquidation Decision." Journal of Financial Economics, 13 (1):137–151.
- Verwijmeren, Patrick and Jeroen Derwall. 2010. "Employee Well-being, Firm Leverage, and Bankruptcy Risk." Journal of Banking & Finance, 34 (5):956–964.
- Welch, Kyle and Aaron Yoon. 2020. "Corporate Sustainability and Stock Returns: Evidence from Employee Satisfaction." Available at SSRN 3616486.

Figure 1: Example Glassdoor Review

\bigcirc 20k 29k 3.4k 292 2.6k 6.1k Jobs Salaries Interviews Benefits Photos Overview Reviews September 5, 2012 Helpful (3) "I can only speak to a career in Sales; and even though I did DELL relatively well, it was miserable." 2.0 \star \star \star \star \star \star \star Current Employee - Account Manager in Round Rock, TX Work/Life Balance Negative Outlook Approves of CEO \star \star \star \star echnologies full-time for more than 5 years Culture & Values $\star \star \star \star \star$ mpany that looks good on your resume for the most part. Career Opportunities lustry that gives you visibility to the latest technologies. $\star \star \star \star \star$ Compensation and Benefits $\star \star \star \star \star$ er advancement, at least not in Sales. They make it near Senior Management e company. $\star \star \star \star \star$ Promote career advancement and assist your reps so that their careers don't go stagnant and they become less productive. Also, the nanomanagement has got to stop. Focus more on the basics, like selling rather than being so metric-centric. Helpful (3) Panel B: PetSmart \bigcirc 5.7k 42k 11k 1.2k 1.3k 293 Reviews Jobs Salaries Interviews Benefits Photos Overview Helpful (3) December 8, 2014 "Petsmart is rapidly changing going from a publicly traded PETSMART company to private. This has brought on a lot of uncertainty" 3.0 \star \star \star \star \star \star \star \star Current Employee - Store Manager in Dallas, TX Doesn't Recommend Neutral Outlook I have been working at PetSmart full-time for more than 5 years Pros Associates truly care about pets and how they can assist the customers in taking care of them. Cons Payroll reductions at store level have made it difficult to complete all of the tasks and maintain scorecard metrics that the company expects. We have been asked to do a lot more, with a lot less. The top 20% of the managers make it happen despite the obstacles. Advice to Management It's not what you say but what you do. Starting to build distrust of upper management because they have lost sight of what PetSmart use to stand for. Cost reductions have

Panel A: Dell Technologies

Note: This figure provides two examples of Glassdoor reviews retrieved on March 12, 2021 from Dell Review and PetSmart Review.

knowledge.

sacrificed customer service in a specialty business that customers truly count on our

Figure 2: Deal Sample Overview



Note: This figure presents the number of deals per quarter in the main LBO sample that we include in analysis, which are Pitchbook deals matched to Glassdoor that occur between 2010 and 2016, and comprise "vanilla", public-to-private, and corporate divestiture LBOs. The figure also shows three other deal types: management buyouts, growth equity deals and M&As.



Ņ 2 ς. $\overline{\gamma}$ $\overline{\Sigma}$ Ņ Ņ -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 Quarters from Deal (0 is Deal Quarter) -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 Quarters from Deal (0 is Deal Quarter) -8 -7 -6 9 10 11 12 -8 -7 9 -6 Panel C: Culture & Values Panel D: Senior Management Ņ 2 **.**



-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 Quarters from Deal (0 is Deal Quarter)

0

7

Ņ

-8 -7 -6 Panel B: Work-Life Balance

-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 Quarters from Deal (0 is Deal Quarter)

10 11 12

10 11 12

Note: This figure presents differences-in-differences event studies of the effect of LBOs on four dimensions of employee satisfaction, using Equation (4). The unit of observation is the review, and we present separate coefficients for 8 quarters before and 12 quarters after the buyout. The regression is fully saturated, including dummies for all quarters around the buyout. We omit quarter -1 (the quarter before the buyout). Standard errors are clustered at the company level.

0

Ę.

2

-8 -7 -6

10 11 12

9



Figure 4: Event Study of Effects of High-leverage LBOs on Dimensions of Employee Satisfaction

Panel A: Compensation & Benefits

Panel B: Work-Life Balance

Note: This figure presents differences-in-differences event studies of the effect of high-leverage LBOs (120 deals) on four dimensions of employee satisfaction, using Equation (4). The unit of observation is the review, and we present separate coefficients for 8 quarters before and 12 quarters after the buyout. The regression is fully saturated, including dummies for all quarters around the buyout. We omit quarter -1 (the quarter before the buyout). Standard errors are clustered at the company level.



Figure 5: Investor Return and Changes in Employee Satisfaction

Note: The figure presents bin-scatter plots of the changes in residualized average quarterly ratings of employees on the deal-level gross-of-fee returns in the LBO-SPI matched sample. The rating category is indicated at the top of each column. Returns are measured as either the deal's IRR (top row), TVM (middle), or PME (bottom), as indicated by the *x*-axis title. PMEs are computed against the style and target firm's industry sector of the Russell 2000 index. The returns are transformed by taking the natural log of 1 plus the return value for IRR, and 0.1 plus value for multiples, before taking the average within the respective return quantile.



Figure 6: Investor Return and Changes in Employee Pay

Note: The figure presents bin-scatter plots of the changes in residualized average quarterly pay of employees on the deal-level grossof-fee returns in the LBO-SPI matched sample. The pay category is indicated at the top of each column. Returns are measured as either the deal's IRR (top row), TVM (middle), or PME (bottom), as indicated by the *x*-axis title. PMEs are computed against the style and target firm's industry sector of the Russell 2000 index. The returns are transformed by taking the natural log of 1 plus the return value for IRR, and 0.1 plus value for multiples, before taking the average within the respective return quantile.

Table 1: Summary Statistics

		All			Ever-LBO Sample			Control Sample		
	N	Mean	SD	Ν	Mean	SD	N	Mean	SD	
Company-Quarter Level										
Number of Reviews	865,723	4.19	18.76	23,261	5.74	13.16	842,462	4.15	18.89	
Avg. Compensation & Benefits	859,501	3.42	1.15	23,184	3.18	1.03	836,317	3.43	1.15	
Avg. Work-Life Balance	861,251	3.64	1.17	23,212	3.45	1.07	838,039	3.64	1.17	
Avg. Culture & Values	769,555	3.68	1.28	19,626	3.42	1.18	749,929	3.69	1.28	
Avg. Senior Management	852,586	3.37	1.32	23,093	3.10	1.20	829,493	3.38	1.33	
Avg. Base Earnings	542,169	59,742	34,392	10,347	60,656	33,224	531,822	59,724	34,414	
Avg. Variable Earnings	542,169	4,349	14,494	10,347	5,712	15,900	531,822	4,322	14,646	
Avg. Any Variable Earnings	542,169	0.251	0.393	10,347	0.311	0.396	531,822	0.250	0.393	
Review Level										
Compensation & Benefits	3,306,724	3.48	1.26	120,257	3.23	1.30	3,186,467	3.49	1.25	
Work-Life Balance	3,313,771	3.59	1.32	120,361	3.47	1.36	3,193,410	3.60	1.31	
Culture & Values	3,042,656	3.71	1.39	110,110	3.49	1.45	2,932,546	3.72	1.39	
Senior Management	3,226,962	3.36	1.44	117,528	3.18	1.48	3,109,434	3.36	1.43	
Base Earnings	1,460,000	63,213	40,155	33,748	57,821	38,059	1,426,000	63,340	40,195	
Variable Earnings	1,460,000	5,633	18,751	33,748	5,818	20,205	1,426,000	5,629	18,715	
Any Variable Earnings	1,460,000	0.299	0.458	33,748	0.302	0.459	1,426,000	0.299	0.458	

Panel A: Glassdoor Employee Review Scores and Earnings

Panel B: Employee Characteristics

	All			Ever-LBO Sample			Control Sample		
	N	Mean	SD	Ν	Mean	SD	N	Mean	SD
Reported Tenure									
Tenure ≤ 1 Years	2,395,634	0.25	0.43	82,972	0.28	0.45	2,312,662	0.25	0.43
Tenure 1-3 Years	2,395,634	0.29	0.46	82,972	0.30	0.46	2,312,662	0.29	0.46
Tenure 3-5 Years	2,395,634	0.19	0.39	82,972	0.19	0.39	2,312,662	0.19	0.39
Tenure ≥ 5 Years	2,395,634	0.26	0.44	82,972	0.23	0.42	2,312,662	0.26	0.44
Reported Job Title									
Is Managerial	2,319,534	0.16	0.36	79,809	0.17	0.38	2,239,725	0.16	0.36
Typically Requires ≤ 1 Years Exp.	1,529,258	0.14	0.35	52,509	0.14	0.35	1,476,749	0.14	0.35
Typically Requires 1-3 Years Exp.	1,529,258	0.27	0.44	52,509	0.26	0.44	1,476,749	0.27	0.44
Typically Requires 3-5 Years Exp.	1,529,258	0.37	0.48	52,509	0.34	0.47	1,476,749	0.37	0.48
Typically Requires ≥ 5 Years Exp.	1,529,258	0.23	0.42	52,509	0.26	0.44	1,476,749	0.23	0.42
Typically Requires Only High School	1,529,258	0.18	0.39	52,509	0.21	0.41	1,476,749	0.18	0.39
Typically Requires College	1,529,258	0.76	0.43	52,509	0.75	0.43	1,476,749	0.76	0.43
Typically Requires Masters/Professional	1,529,258	0.06	0.24	52,509	0.04	0.19	1,476,749	0.06	0.24

Table 1: Summary Statistics—Continued

Panel C: Deal Statistics

	Ν	Mean	SD
By Deal Type			
Vanilla LBO	1,371	0.73	0.44
Public to Private	1,371	0.11	0.31
Corporate Divestiture	1,371	0.16	0.36
By PitchBook Industry Sector			
Business Products/Services	1,371	0.32	0.47
Consumer Products/Services	1,371	0.23	0.42
Energy	1,371	0.02	0.13
Financial Services	1,371	0.04	0.20
Healthcare	1,371	0.15	0.35
Information Technology	1,371	0.23	0.42
Materials and Resources	1,371	0.01	0.10
Deal Characteristics			
Deal Size (USD m)	547	723.09	1755.61
Leverage	241	0.52	0.35
Number of Employees	788	2026.61	7435.39
Impact Fund	1,371	0.03	0.18
ESG/Impact Fund	1,371	0.13	0.34

Panel D: Deal-level Investor Returns

	Ν	Mean	SD	p5	p50	p95
Fund Size (USD b)	351	3.48	4.56	0.21	1.29	14.68
Fund IRR quartile	333	2.73	0.75	2.00	3.00	4.00
Fund IRR	333	0.21	0.13	0.06	0.19	0.40
Deal Amount Invested (USD b)	351	0.15	0.19	0.01	0.08	0.55
Deal IRR	348	0.40	0.52	-0.14	0.28	1.36
Deal IRR rank within Fund	348	0.53	0.28	0.01	0.56	0.91
Deal IRR rank within Quarter	349	0.59	0.28	0.05	0.65	0.95
Deal TVM	351	3.01	2.74	0.14	2.20	8.21
Deal TVM rank within Fund	350	0.55	0.29	0.01	0.61	0.94
Deal TVM rank within Quarter	350	0.62	0.29	0.00	0.70	0.95
Deal PME vs Russel 2000 Style	338	2.23	2.09	0.08	1.66	5.68
Deal PME vs Russel 2000 Sector	338	2.00	1.93	0.00	1.51	5.35
Mimicking public company IRR	1,882	0.09	0.30	-0.33	0.08	0.51
Mimicking public company TVM	1,888	1.65	1.42	0.34	1.30	4.09
Mimicking public company PME	1,888	1.06	0.84	0.14	0.91	2.43

Note: This table presents summary statistics. Panel A presents statistics on each Glassdoor rating dimension, reported pay, and the number of reviews at company-quarter and review level. The Ever-LBO sample is all the companies with LBO deals in our main analysis, including vanilla LBOs, public-to-private deals, and corporate divestitures (together, these comprise 1,371 deals). The control sample is non-targeted companies. Panel B presents statistics on employee characteristics. Reported Tenure is the length of employment as reported on Glassdoor. Whether a reviewer's reported job title is managerial and the work experience and education it typically requires are calculated as discussed in Section 1. Panel C presents deal characteristics of the PitchBook-Glassdoor matched deals in our main analysis. Panel D describes the investor return data from the Stepstone SPI database that is matched to Glassdoor company and Pitchbook deal information. The last three lines describe the returns metrics for the mimicking public equity investments. We follow Korteweg and Nagel (2016) to construct cash flows out of stock returns from CRSP to mimic the patterns observed in private equity. We take the closest five matches for each LBO deals using the distance metric from Abadie and Imbens (2006). PMEs are calculated relative to the relevant Russell 2000 Sector Index.

		Satisfact	ion Data		Pay Data				
	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
1(Post LBO)	-0.083***	-0.064***	-0.092***	-0.062***	0.015	0.099	0.011		
	(0.018)	(0.019)	(0.025)	(0.022)	(0.010)	(0.085)	(0.010)		
1(Post M&A)	-0.047**	-0.019	-0.039	-0.070***	-0.018	0.139	0.014		
	(0.019)	(0.021)	(0.028)	(0.024)	(0.012)	(0.106)	(0.012)		
1(Post Management Buyout)	-0.088*	0.026	0.017	0.003	0.007	-0.264	-0.035		
	(0.048)	(0.052)	(0.070)	(0.057)	(0.026)	(0.237)	(0.026)		
1(Post Growth Equity)	-0.009	-0.010	-0.013	-0.013	0.022	-0.071	-0.008		
	(0.026)	(0.027)	(0.036)	(0.030)	(0.013)	(0.136)	(0.015)		
Observations	874,801	876,572	782,966	867,847	488,546	488,546	488,546		
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
R-squared	0.354	0.325	0.351	0.346	0.606	0.436	0.415		
Outcome S.D.	1.144	1.169	1.276	1.321	0.510	3.507	0.391		

Table 2: Effect of Ownership Changes on Job Quality

Note: This table reports the effect of four types of ownership changes on job quality measures. The sample includes 1,371 LBOs, 1,010 M&As, 178 management buyouts, and 700 growth equity deals. We use company-quarter average reviews and reported pay as the dependent variable (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes < 0.05, and * denotes < 0.1.

		Satisfact	ion Data			Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable		
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
1(Post LBO)	-0.061***	-0.031	-0.017	-0.040	0.004	-0.036	-0.007		
	(0.022)	(0.024)	(0.030)	(0.027)	(0.010)	(0.083)	(0.009)		
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Manager})$	0.009	-0.121***	-0.040	-0.005	0.023**	0.361***	0.049***		
	(0.020)	(0.025)	(0.025)	(0.026)	(0.011)	(0.097)	(0.010)		
1(Manager)	0.256***	0.056***	0.203***	0.216***	0.431***	1.583***	0.153***		
	(0.004)	(0.004)	(0.004)	(0.004)	(0.002)	(0.016)	(0.002)		
Observations	673,506	675,028	606,678	667,498	565,438	565,438	565,438		
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
R-squared	0.363	0.327	0.353	0.358	0.659	0.433	0.407		
Outcome S.D.	1.170	1.201	1.288	1.347	0.536	3.700	0.408		

Table 3: Effect of LBOs on Job Quality by Manager Status

Note: This table shows the effect of an LBO interacted with each reviewer's manager status, using company-quarter level data. We identify managers using the reviewer's job title. For each company-quarter, we compute average ratings and reported pay for managers and non-managers separately. The interaction with non-manager status is omitted so that the coefficient on 1 (Post LBO) represents the effect for that group. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

		Satisfact	tion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1(Post LBO)	-0.011	0.018	0.010	0.036	0.008	0.116	0.013	
	(0.026)	(0.026)	(0.029)	(0.036)	(0.012)	(0.114)	(0.013)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(3+ \text{Years Tenure})$	-0.121***	-0.121***	-0.115***	-0.074***	0.005	-0.064	-0.007	
	(0.018)	(0.018)	(0.020)	(0.022)	(0.009)	(0.086)	(0.009)	
1(3+ Years Tenure)	0.043***	-0.074***	-0.066***	-0.119***	0.199***	0.962***	0.101***	
	(0.024)	(0.003)	(0.003)	(0.026)	(0.001)	(0.012)	(0.001)	
Observations	756,552	758,113	2,098,274	755,296	427,413	427,413	427,413	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.343	0.318	0.219	0.329	0.591	0.420	0.398	
Outcome S.D.	1.185	1.211	1.391	1.302	0.523	3.669	0.407	

Table 4: Effect of LBOs on Job Quality by Employee Tenure at Firm

Note: This table reports how the effect of an LBO varies with the number of years an employee has been at the firm, using company-quarter level data. For each company-quarter, we compute average ratings and reported pay for reviewers with 0-3 years of tenure and 3+ years of tenure separately. The interaction with 0-3 years of tenure is omitted so that the coefficient on (Post LBO) represents the effect for that group. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

Table 5: Effect of LBOs on Job Quality by Job Requirements

		Satisfact	ion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1 (Post LBO)	-0.089***	-0.030	-0.054	-0.055*	-0.004	-0.053	-0.011	
	(0.027)	(0.029)	(0.034)	(0.032)	(0.014)	(0.110)	(0.012)	
$1(Post LBO) \times 1(Req. 3+ Years Exp.)$	0.033***	-0.047**	0.006	0.020	0.028**	0.095	0.015	
	(0.022)	(0.023)	(0.024)	(0.025)	(0.013)	(0.095)	(0.010)	
1 (Req. 3+ Years Exp.)	0.093***	0.090***	0.096***	0.095***	0.271***	0.844***	0.085***	
	(0.004)	(0.004)	(0.004)	(0.004)	(0.002)	(0.014)	(0.002)	
Observations	539,588	540,449	484,881	536,066	454,759	454,759	454,759	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.349	0.321	0.345	0.353	0.592	0.410	0.389	
Outcome S.D.	1.178	1.217	1.306	1.360	0.518	3.732	0.413	

Panel A: Interaction with Job's Required Work Experience

Panel B: Interaction with Job's Required Education

		Satisfact	tion Data			Pay Data	
	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.103***	-0.036	-0.038	-0.050	-0.013	-0.105	-0.014
	(0.032)	(0.034)	(0.038)	(0.037)	(0.017)	(0.129)	(0.015)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Req. College})$	0.035	-0.035	-0.024	0.003	0.033**	0.132	0.016
	(0.025)	(0.028)	(0.027)	(0.029)	(0.015)	(0.109)	(0.012)
$1(Post LBO) \times 1(Req. Masters/Prof)$	0.111***	0.028	0.014	0.093*	0.008	0.130	0.018
	(0.047)	(0.046)	(0.051)	(0.055)	(0.047)	(0.222)	(0.023)
1(Req. College)	0.053***	0.092***	0.105***	0.098***	0.280***	0.928***	0.096***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.018)	(0.002)
1(Req. Masters/Prof)	0.112***	0.125***	0.140***	0.142***	0.532***	1.326***	0.124***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.006)	(0.030)	(0.003)
Observations	536,006	536,914	481,774	532,309	448,981	448,981	448,981
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.346	0.318	0.342	0.350	0.593	0.413	0.392
Outcome S.D.	1.181	1.221	1.311	1.364	0.529	3.724	0.412

Note: This table reports how the effect of an LBO on an employee varies with the work experience (Panel A) and education (Panel B) that employee's job typically requires, using company-quarter level data. The work experience and education each reviewer's reported job title typically requires is calculated as described in Section 1. For each company-quarter, we compute average ratings and reported pay for reviewers in each group separately. The coefficient on 1(Post LBO) in represents the effect on the least qualified group (jobs typically not requiring > 3 year work experience or college). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table 6: Heterogeneity in Effect of LBOs on Job Quality by Deal Leverage

		Pane	el A: By Media	1			
		Satisfact	tion Data			Pay Data	
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Low Leverage})$	-0.076*	-0.054	-0.014	-0.055	0.030*	0.349*	0.033
	(0.040)	(0.047)	(0.066)	(0.050)	(0.018)	(0.185)	(0.020)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{High Leverage})$	-0.197***	-0.184***	-0.144**	-0.133**	-0.018	0.049	0.001
	(0.043)	(0.044)	(0.067)	(0.054)	(0.027)	(0.224)	(0.026)
Observations	842,903	844,632	755,134	836,066	478,018	478,018	478,018
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.356	0.327	0.353	0.349	0.607	0.438	0.416
Outcome S.D.	1.146	1.170	1.278	1.323	0.510	3.502	0.391

Panel B: By Quartile Satisfaction Data Pay Data Compensation Work-Life Culture & Senior Base Variable Any Variable & Benefits Balance Values Management Earnings Earnings Earnings (1)(2) (3) (4) (5) (6) (7) $\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Leverage Q1})$ -0.042 -0.012 0.071 -0.018 -0.013 0.521* 0.057* (0.054)(0.061)(0.078)(0.069)(0.026)(0.293) (0.031) $1(\text{Post LBO}) \times 1(\text{Leverage Q2})$ -0.111* -0.105 -0.092 0.053** 0.113 0.003 -0.096 (0.107)(0.059)(0.072)(0.073)(0.025)(0.258)(0.028) $\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Leverage Q3})$ -0.192*** -0.181*** -0.186* -0.192** -0.017 -0.010 -0.136 (0.104)(0.036)(0.298)(0.034)(0.059)(0.061)(0.085) $1(\text{Post LBO}) \times 1(\text{Leverage Q4})$ -0.202*** -0.186*** -0.108 -0.088 0.006 0.355 0.033 (0.030)(0.061)(0.062)(0.086)(0.067)(0.036)(0.262)Observations 842,903 844,632 755,134 836,066 478,018 478,018 478,018 Company FE Yes Yes Yes Yes Yes Yes Yes Industry-Quarter FE Yes Yes Yes Yes Yes Yes Yes R-squared 0.356 0.327 0.353 0.349 0.607 0.438 0.416 Outcome S.D. 1.170 0.510 0.391 1.146 1.278 1.323 3.502

Panel C: Continuous

		Satisfact	tion Data			Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable		
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
1(Post LBO)	-0.036	-0.009	0.032	-0.041	0.016	0.381	0.036		
	(0.050)	(0.059)	(0.081)	(0.065)	(0.024)	(0.244)	(0.027)		
$\mathbb{1}(\text{Post LBO}) \times (\text{Leverage})$	-0.191**	-0.208**	-0.212	-0.101	-0.001	-0.344	-0.032		
	(0.082)	(0.092)	(0.129)	(0.103)	(0.028)	(0.277)	(0.030)		
Observations	842,903	844,632	755,134	836,066	484,579	484,579	484,579		
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
R-squared	0.356	0.327	0.353	0.349	0.606	0.436	0.415		
Outcome S.D.	1.146	1.170	1.278	1.323	0.510	3.504	0.391		

Note: This table shows whether deal leverage is associated with different effects relative to a base of non-targeted companies, using Equation (1). We use company-quarter level data, and omit LBOs for which leverage is not observed. Panel A divides the sample of LBOs around median leverage, Panel B in quartiles, and in Panel C we use continuous leverage. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table 7: Heterogeneity in Effect of LBOs on Job Quality by Deal Type and Size

		Satisfac	tion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Public to Private})$	-0.069*	-0.067	-0.096	-0.069	-0.004	-0.204	-0.027	
	(0.040)	(0.044)	(0.061)	(0.050)	(0.020)	(0.168)	(0.019)	
$1(Post LBO) \times 1(Corp. Divestiture)$	-0.120***	-0.158***	-0.107*	-0.098**	0.022	0.270	0.031	
	(0.044)	(0.043)	(0.059)	(0.050)	(0.023)	(0.231)	(0.025)	
1(Post LBO) × 1(Vanilla LBO)	-0.077***	-0.037	-0.090***	-0.052*	0.020	0.161	0.018	
	(0.022)	(0.023)	(0.030)	(0.027)	(0.013)	(0.107)	(0.012)	
Observations	859,501	861,251	769,555	852,586	484,579	484,579	484,579	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.355	0.326	0.352	0.347	0.606	0.436	0.415	
Outcome S.D.	1.145	1.170	1.277	1.323	0.510	3.504	0.391	

Panel A: Deal Type

Panel B: Deal Size

		Satisfact	tion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
$1(Post LBO) \times 1(Small Deal Size)$	-0.123***	-0.062*	-0.153***	-0.053	0.013	0.190	0.018	
	(0.032)	(0.035)	(0.048)	(0.041)	(0.020)	(0.171)	(0.019)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Large Deal Size})$	-0.095***	-0.112***	-0.057	-0.115***	-0.006	0.085	0.007	
	(0.034)	(0.036)	(0.053)	(0.041)	(0.017)	(0.156)	(0.017)	
Observations	847,818	849,553	759,218	840,953	480,056	480,056	480,056	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.355	0.326	0.353	0.348	0.607	0.437	0.416	
Outcome S.D.	1.145	1.170	1.277	1.323	0.510	3.504	0.391	

Note: This table shows whether deal type and deal size lead to different effects relative to a base of non-targeted companies, using Equation (1). We use company-quarter level data. Panel A divides the sample of LBOs into three deal types: corporate divestitures, public-to-private deals, and "vanilla" deals in which a private, independent company is acquired. Panel B divides the sample of LBOs by deal size (top vs. bottom two terciles). Deals with missing size are excluded. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table 8: Association of Job Quality Changes with Investor Returns

		Satisfacti	ion Data			Pay Data	
	Compensation & Benefits	Work-life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings?
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
log(Return)	0.254***	0.211***	0.252***	0.230***	0.014	0.688***	0.074***
	(0.078)	(0.074)	(0.094)	(0.087)	(0.026)	(0.241)	(0.025)
Observations	350	351	228	350	241	241	241
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.557	0.589	0.554	0.605	0.554	0.592	0.624
Outcome S.D.	0.798	0.792	0.864	0.935	0.258	2.845	0.326

Panel A: Within the LBO sample

Panel B: Association Between IRR and Job Quality Changes Around Deal Relative to Public Matches

	Compe & Be	ensation enefits	Work-life Balance		Culture & Values		Senior Management	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LBO \times log(Return)$	0.191**		0.210*		0.014		0.062	
	(0.093)		(0.107)		(0.126)		(0.147)	
LBO \times Return Pctle		0.187**		0.204**		-0.037		0.072
		(0.078)		(0.086)		(0.084)		(0.090)
log(Return)	0.176**		0.093		0.367***		0.286^{**}	
	(0.076)		(0.083)		(0.098)		(0.132)	
Return Pctle		0.245***		0.126**		0.385***		0.363***
		(0.061)		(0.051)		(0.069)		(0.079)
LBO	-0.204***	-0.194***	-0.101***	-0.110**	-0.098**	0.000	-0.069	-0.022
	(0.032)	(0.047)	(0.037)	(0.054)	(0.045)	(0.062)	(0.045)	(0.067)
Observations	2,189	2,189	2,189	2,189	1,444	1,444	2,190	2,190
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.593	0.597	0.664	0.665	0.657	0.659	0.684	0.689
Outcome S.D.	0.696	0.696	0.790	0.790	0.842	0.842	0.899	0.899

Note: This table reports tests of the association between deals' gross-of-fee returns and the changes in employee reviews around the deal. The dependent variables are the change in the residualized quarterly average ratings or reported wages (as indicated in the column of the table) from the pre-deal quarters average to the post-deal quarters average. The independent variable of interest are (i) a natural log of 1.1 plus IRR of the deal, and (ii) the percentile rank of the deal's IRR. Panel A reports analysis that uses only the sample of LBOs, while in Panel B the sample is augmented with mimicking investments in public companies. Thus, 'LBO' is a dummy variables that takes a value of 1 for actual LBOs and 0 for the mimicking public investments, each entering as a separate observation. For each LBO we match with replacement up to five public companies based on industry, year founded, log number of reviews, share of jobs requiring only a high school diploma, and share of reviews by employees with at least three years of tenure. The IRRs of the matching LBO (see Section 4 for details). The IRR percentile ranks are computed separately within the LBO sample and within the mimicking public investments sample. In Panel A, the control variables include year of the deal, amounted invested, and the average rating or salary data before the deal that corresponds to the dependent variable. In Panel B, the control variables include the pre-deal rating averages and the deal case fixed effects that indicate each LBO with the mimicking investments that match to it. Standard errors are clustered the industry sub-sector of the LBO, as indicated in SPI. In Panel B, we double-cluster by the company identifier and the LBO industry sub-sector. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management
	(1)	(2)	(3)	(4)
1(Post LBO)	-0.075***	-0.071***	-0.102***	-0.073***
	(0.021)	(0.022)	(0.029)	(0.026)
$1(Post LBO) \times 1(High Unemployment)$	-0.073**	-0.028	-0.123**	-0.064
	(0.035)	(0.037)	(0.048)	(0.043)
Observations	559,723	560,447	475,634	555,655
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.372	0.344	0.383	0.363
Outcome S.D.	1.125	1.160	1.274	1.305

Table 9: Heterogeneity in Effect of LBOs on Job Quality by Labor Market Tightness

Note: This table shows the effect of an LBO interacted with the unemployment rate in the firm's industry. We use companyquarter level data. 1(High Unemployment) takes the value of one if an industry's unemployment rate is in the top tercile among all industries in the same year. Industry-level unemployment data is from the U.S. Bureau of Labor Statistics. We manually map NAIC 3-digit industry to Glassdoor industry. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Appendix: For Online Publication



Figure A.1: Distribution of Glassdoor Ratings

Note: This figure presents histograms of the four rating dimensions in the universe of Glassdoor over the period 2008 to 2019. The *y*-axis is the fraction for each score (the sum of bar heights equals one). The red line is fitted (normally-distributed) curve with the same mean and standard deviation as those from the data. Glassdoor added Culture & Values as a rating item in May 2012, when it also disallowed half-point scores for other rating items. Half-point scores (2% of the sample) are dropped from the figure.



Figure A.2: Event Study of Effects of LBOs on Reported Pay

Note: This figure presents differences-in-differences event studies of the effect of LBOs on reported pay, using Equation (4). The unit of observation is the review, and we present separate coefficients for 8 quarters before and 12 quarters after the buyout. The regression is fully saturated, including dummies for all quarters around the buyout. We omit quarter -1 (the quarter before the buyout). Standard errors are clustered at the company level.





Note: This figure presents differences-in-differences event studies of the effect of LBOs on reviewer composition by employee and job characteristics, including average reviewer tenure in years, average reviewer jobs' required work experience in years, % of reviewers in jobs that typically require only high school, and % of reviewers with a managerial position. The unit of observation is a company-quarter, and we present separate coefficients for 8 quarters before and 12 quarters after the buyout. The regression is fully saturated, including dummies for all quarters around the buyout. We omit quarter -1 (the quarter before the buyout). Standard errors are clustered at the company level.



Figure A.4: Employment Dynamics Around LBOs

Note: This figure presents employment dynamics around LBOs. Employment data is from LinkedIn. The *y*-axis is the mean value shown by point symbols and capped by 95% confidence intervals. We present means for 4 years before and 4 years after the buyout.



Figure A.5: Investor Return and Changes in Employee Satisfaction for Mimicking Public Equity Investments

Note: The figure presents bin-scatter plots of the changes in average quarterly ratings of employees on the returns attained by investments in public companies in portfolios structured to match private equity cashflows. The rating category is indicated at the top of each column. The returns are measured as either the deal's IRR (top row), or TVM (middle), or PME (bottom), as indicated by the *x*-axis title. PMEs are computed against the style and the investee firm's industry sector of the Russell 2000 index. The returns are transformed by taking the natural log of 1 plus the return value for IRR, and 0.1 plus value for multiples before taking the average within the respective return quantile. We consider hypothetical investments in public equities that mimic the cash flow pattern of each of the LBOs in our sample. For each LBO target, we match 5 closest peers by industry, size, age, and labor force characteristics. The distance is computed following Abadie and Imbens (2006). The mimicking cash flows are computed following Korteweg and Nagel (2016).





Note: This figure presents differences-in-differences event studies of the effect of LBOs on textual measures from reviewer comments. The unit of observation is a review, and we present separate coefficients for 8 quarters before and 12 quarters after the buyout. The regression is fully saturated, including dummies for all quarters around the buyout. We omit quarter -1 (the quarter before the buyout). Standard errors are clustered at the company level.



Figure A.7: Number of Glassdoor Reviews by Quarter

Note: This figure presents the total number of reviews in Glassdoor each quarter from 2008 to 2019.

Table A.1: Correlation Matrix of Glassdoor Ratings

	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	Benefits
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	Rating
Compensation & Benefits	1.000							
Work-Life Balance	0.486***	1.000						
Culture & Values	0.565***	0.620***	1.000					
Senior Management	0.568***	0.617***	0.786***	1.000				
Base Earnings	0.228***	0.149***	0.109***	0.099***	1.000			
Variable Earnings	0.161***	0.096***	0.111***	0.105***	0.361***	1.000		
Any Variable Earnings	0.145***	0.089***	0.104***	0.096***	0.323***	0.982***	1.000	
Benefits Rating	0.731***	0.483***	0.570***	0.540***	0.188***	0.154***	0.146***	1.000

Note: This table presents the correlation matrix of rating dimensions and reported pay in the universe of Glassdoor over our 2008 to 2019 sample period. *** denotes p-value <0.01, ** denotes p-value <0.05, and * denotes p-value <0.1.

	M	anagement	Buyouts	Growth Equity Deals		
	Ν	Mean	SD	N	Mean	SD
By PitchBook Industry Sector						
Business Products/Services	178	0.34	0.48	700	0.26	0.44
Consumer Products/Services	178	0.21	0.41	700	0.22	0.41
Energy	178	0.03	0.17	700	0.02	0.15
Financial Services	178	0.06	0.24	700	0.06	0.23
Healthcare	178	0.08	0.28	700	0.15	0.35
Information Technology	178	0.25	0.44	700	0.28	0.45
Materials and Resources	178	0.02	0.13	700	0.02	0.14
Deal Characteristics						
Deal Size (USD m)	70	793.05	3123.85	292	93.66	262.19
Leverage	28	0.51	0.32	48	0.68	0.31
Number of Employees	89	2754.43	12314.14	332	936.48	2830.62
Impact Fund	178	0.03	0.17	700	0.02	0.12
ESG/Impact Fund	178	0.11	0.32	700	0.07	0.25

Table A.2: Deal Characteristics of Management Buyouts and Growth Equity Deals

Note: This table presents characteristics of the 2010 to 2016 Pitchbook MBOs and growth equity deals in our analysis sample.

	All PB Deals			GE	Matched	Deals	Deals in Analysis Sample		
	Ν	Mean	SD	Ν	Mean	SD	Ν	Mean	SD
By Deal Type									
Vanilla LBO	3,572	0.75	0.44	2,762	0.75	0.43	1,371	0.73	0.44
Public to Private	3,572	0.07	0.25	2,762	0.08	0.26	1,371	0.11	0.31
Corporate Divestiture	3,572	0.19	0.39	2,762	0.17	0.38	1,371	0.16	0.36
By PitchBook Industry Sector									
Business Products/Services	3,572	0.35	0.48	2,762	0.34	0.47	1,371	0.32	0.47
Consumer Products/Services	3,572	0.20	0.40	2,762	0.21	0.41	1,371	0.23	0.42
Energy	3,572	0.04	0.18	2,762	0.03	0.16	1,371	0.02	0.13
Financial Services	3,572	0.05	0.23	2,762	0.05	0.22	1,371	0.04	0.20
Healthcare	3,572	0.15	0.35	2,762	0.16	0.36	1,371	0.15	0.35
Information Technology	3,572	0.17	0.38	2,762	0.19	0.39	1,371	0.23	0.42
Materials and Resources	3,572	0.04	0.19	2,762	0.03	0.16	1,371	0.01	0.10
Deal Characteristics									
Deal Size (USD m)	1,367	529.20	2326.83	1,009	525.20	1440.30	547	723.09	1755.61
Leverage	408	0.52	0.33	351	0.50	0.33	241	0.52	0.35
Number of Employees	1,970	1230.76	5009.25	1,472	1348.95	5567.17	788	2026.61	7435.39
Impact Fund	3,572	0.03	0.16	2,762	0.03	0.17	1,371	0.03	0.18
ESG/Impact Fund	3,572	0.11	0.31	2,762	0.11	0.31	1,371	0.13	0.34

Table A.3: Comparison of Pitchbook, Glassdoor, and Matched Samples

Note: This table presents characteristics of Pitchbook LBOs between 2010 and 2016, the deals we matched to Glassdoor, and the deals in our analysis sample.

	All			Ever-I	M&A Sa	mple	Control Sample		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Company-Quarter Level									
Number of Reviews	843,357	4.16	18.89	15,096	6.07	14.52	828,261	4.12	18.96
Avg. Compensation & Benefits	837,213	3.42	1.15	15,072	3.29	0.96	822,141	3.43	1.15
Avg. Work-Life Balance	838,935	3.64	1.17	15,064	3.44	1.03	823,871	3.64	1.17
Avg. Culture & Values	750,419	3.69	1.28	11,682	3.38	1.14	738,737	3.70	1.28
Avg. Senior Management	830,392	3.38	1.32	15,009	3.01	1.13	815,383	3.39	1.33
Review Level									
Compensation & Benefits	3,197,134	3.49	1.25	83,953	3.35	1.21	3,113,181	3.50	1.26
Work-Life Balance	3,204,088	3.60	1.31	83,928	3.43	1.31	3,120,160	3.60	1.31
Culture & Values	2,941,598	3.72	1.39	72,483	3.45	1.41	2,869,115	3.73	1.38
Senior Management	3,119,909	3.36	1.43	82,674	3.08	1.41	3,037,235	3.37	1.43

Table A.4: Summary Statistics of M&A Sample Reviews

Note: This table presents summary statistics for our M&A sample on each Glassdoor rating dimension and the number of reviews at company-quarter and review level. The Ever-M&A sample is all the companies with M&A deals in our main analysis (1,010 deals). The control sample is non-targeted companies.

	Deals	in Analysi	s Sample	Return-matched Deals		
	N	Mean	SD	N	Mean	SD
Deal Type						
Vanilla LBO	1,371	0.73	0.44	351	0.56	0.50
Public to Private	1,371	0.11	0.31	351	0.22	0.41
Corporate Divestiture	1,371	0.16	0.36	351	0.22	0.41
PitchBook Industry Sector						
Business Products/Services	1,371	0.32	0.47	351	0.24	0.43
Consumer Products/Services	1,371	0.23	0.42	351	0.22	0.41
Energy	1,371	0.02	0.13	351	0.02	0.15
Financial Services	1,371	0.04	0.20	351	0.04	0.19
Healthcare	1,371	0.15	0.35	351	0.14	0.35
Information Technology	1,371	0.23	0.42	351	0.32	0.47
Materials and Resources	1,371	0.01	0.10	351	0.02	0.14
Deal Characteristics						
Deal Size (USD m)	547	723.09	1755.61	198	909.79	1312.49
Leverage	241	0.52	0.35	117	0.50	0.34
Number of Employees	788	2026.61	7435.39	199	2835.68	7225.2
Impact Fund	1,371	0.03	0.18	351	0.05	0.21
ESG/Impact Fund	1,371	0.13	0.34	351	0.17	0.38
Number of Investors	1,371	1.98	1.25	351	1.76	1.30
Firm Characteristics at Deal Date						
Firm Age	1,021	28.25	25.92	300	28.79	26.46
Number of Reviews	1,371	15.45	44.45	351	19.50	48.50
% Long Tenure	876	0.44	0.34	212	0.47	0.33
% High School	970	0.19	0.32	256	0.16	0.28
Pre-deal Average Ratings						
Compensation & Benefits	1,281	3.20	0.86	334	3.30	0.84
Work-Life Balance	1,284	3.52	0.88	335	3.62	0.83
Culture & Values	952	3.45	1.03	229	3.63	0.92
Senior Management	1,283	3.10	1.00	334	3.19	0.95

Table A.5: Main Analysis Sample and Return-Matched Sample Comparison

Note: This table presents characteristics of Pitchbook-Glassdoor matched LBOs between 2010 and 2016 in our main analysis sample and the deals we matched to return. The firm characteristics at the deal date and pre-deal average ratings are measured for the twelve quarters prior to the LBO deal.

Table A.6: Comparison of LBO and Matched Samples

	LBO targets	Non-target Peers	Difference
	Mean	Mean	T-test
Firm Characteristics at Deal	Date		
Firm Age	28.247	28.528	-0.281
Number of Reviews	15.449	16.563	-1.114
% Long Tenure	0.443	0.443	0.000
% High School	0.193	0.186	0.007
Pre-deal Average Ratings			
Compensation & Benefits	3.198	3.288	-0.090***
Work-Life Balance	3.523	3.525	-0.002
Culture & Values	3.451	3.511	-0.060
Senior Management	3.099	3.184	-0.085***

Panel A: LBO Targets and Matched Non-target Peers

Panel B: LBO Targets and Matched Public Equity Peers

	Return-matched LBO targets	Public Peers	Difference
	Mean	Mean	T-test
Firm Characteristics at Dea	ll Date		
Firm Age	28.790	29.802	-1.012
Number of Reviews	19.499	26.898	-7.399**
% Long Tenure	0.472	0.490	-0.018
% High School	0.161	0.131	0.030*
Pre-deal Average Ratings			
Compensation & Benefits	3.297	3.234	0.063
Work-Life Balance	3.620	3.441	0.179***
Culture & Values	3.634	3.340	0.294***
Senior Management	3.185	3.011	0.174***

Note: Panel A shows pre-deal firm characteristics for the LBO targets and the matched control sample of Glassdoor non-targets. Panel B shows pre-deal firm characteristics for the LBO targets where we have return data and the matched public equity peers. The variable values are measured for the twelve quarters prior to the LBO deal. The unit of observation is a deal. P-values are from a two-sided t-test for means. *** denotes p-value <0.01, ** denotes p-value <0.05, and * denotes p-value <0.1.

		Base pay			Total pay			
	(1)	(2)	(3)	(4)	(5)	(6)		
Log Wage	0.801***	0.585***	0.580***	0.822***	0.626***	0.624***		
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)		
Observations	1,168,792	1,168,792	1,168,792	1,168,792	1,168,792	1,168,792		
Job Title FE	Yes	Yes	Yes	Yes	Yes	Yes		
Company FE	No	Yes	Yes	No	Yes	Yes		
Industry-Quarter FE	No	No	Yes	No	No	Yes		
Mean Wage	63,982	63,982	63,982	69,949	69,949	69,949		

Table A.7: Relationship between Reported Pay and Compensation & Benefits Rating

Note: This table reports the relationship between the Compensation & Benefits rating and reported pay. We use company-quarter average Compensation & Benefits ratings as the dependent variable. Columns (1) - (3) use company-quarter average base pay as the independent variable. Columns (4) - (6) use company-quarter average total pay as the independent variable. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.
Table A.8: Additional Rating Dimensions

	All			Ever-L	BO Sam	ple	Control Sample		e
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Review Level									
Overall Rating	3,708,003	3.70	1.28	133,143	3.49	1.35	3,574,860	3.71	1.27
Career Opportunities	3,311,217	3.48	1.35	120,478	3.27	1.41	3,190,739	3.49	1.35
Recommend this Company	3,068,242	0.72	0.45	112,458	0.65	0.48	2,955,784	0.73	0.45
Business Outlook	2,714,891	0.45	0.76	100,533	0.32	0.81	2,614,358	0.45	0.76
Approves of CEO	2,433,652	0.46	0.72	98,085	0.34	0.76	2,335,567	0.47	0.72
Company-Quarter Level									
Avg. Overall Rating	924,494	3.67	1.19	24,012	3.39	1.10	900,482	3.67	1.19
Avg. Career Opportunities	860,160	3.38	1.24	23,211	3.14	1.13	836,949	3.39	1.25
Avg. Recommend this Company	819,050	0.71	0.40	22,205	0.62	0.39	796,845	0.71	0.40
Avg. Business Outlook	720,425	0.43	0.68	19,030	0.30	0.65	701,395	0.44	0.68
Avg. Approves of CEO	567,124	0.45	0.64	19,669	0.31	0.62	547,455	0.45	0.64

Panel A: Summary Statistics of Additional Rating Dimensions

Panel B: Effect of LBOs on Job Quality on Additional Rating Dimensions

			Satisfa	ction			Benefits
	Overall	Career	Recommend	Business	Approves of		Employer
	Rating	Opportunities	this	Outlook	CEO	Any	Review &
			Company				Wage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.071***	-0.054***	-0.019***	-0.038***	-0.032**	-0.062	-0.006
	(0.019)	(0.019)	(0.007)	(0.015)	(0.014)	(0.052)	(0.087)
Observations	924,494	860,160	819,050	720,425	567,124	481,309	141,457
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.335	0.341	0.288	0.315	0.310	0.303	0.324
Outcome S.D.	1.193	1.244	0.401	0.680	0.641	1.184	1.179

Note: Panel A of this table presents summary statistics on the additional rating types not used in our main analysis. Recommend this Company and Approves of CEO are binary ratings where the reviewer answers Yes or No and we convert them into 1 and 0. Business Outlook has ratings including negative, neutral, and positive, where we convert them into -1, 0, and 1, respectively. Panel B reports the effect of LBOs on employee satisfaction on these additional rating dimensions at the company-quarter level (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

		Satisfac	tion Data		Pay Data			
	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1(Post LBO)	-0.073***	-0.027	-0.064**	-0.023	0.017	0.048	0.004	
	(0.020)	(0.025)	(0.028)	(0.026)	(0.013)	(0.091)	(0.011)	
𝔅 (Post M&A)	-0.048	-0.019	-0.068	-0.072*	-0.002	0.118	0.009	
	(0.034)	(0.027)	(0.044)	(0.038)	(0.014)	(0.139)	(0.013)	
1 (Post Management Buyout)	-0.055*	0.076*	0.078	0.108	-0.006	-0.132	-0.016	
	(0.029)	(0.045)	(0.093)	(0.094)	(0.013)	(0.136)	(0.019)	
1 (Post Growth Equity)	-0.024	0.011	0.005	0.018	0.002	0.098	0.010	
	(0.030)	(0.035)	(0.043)	(0.040)	(0.013)	(0.123)	(0.014)	
Observations	3,396,625	3,403,635	3,126,517	3,314,640	1,414,549	1,414,549	1,414,549	
Company-Deal FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.217	0.181	0.199	0.208	0.461	0.294	0.274	
Outcome S.D.	1.259	1.317	1.390	1.438	0.580	4.180	0.459	

Table A.9: Effect of Ownership Changes on Job Quality: Review-Level

Note: This table reports the effect of four types of ownership changes on job quality measures, using review level data. The sample includes 1,371 LBOs, 1,010 M&As, 178 management buyouts, and 700 growth equity deals. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

	Has variable pay	Has cash bonus	Has stock bonus	Has profit sharing	Has sales commissions
	(1)	(2)	(3)	(4)	(5)
1(Post LBO)	-0.005	-0.003	-0.005	0.003	-0.007
	(0.010)	(0.009)	(0.004)	(0.005)	(0.006)
1(Post LBO) x 1(Manager)	0.039***	0.045***	-0.023***	-0.007**	-0.005
	(0.012)	(0.012)	(0.004)	(0.003)	(0.006)
1(Manager)	0.176***	0.166***	0.042***	0.016***	0.005***
	(0.004)	(0.004)	(0.002)	(0.001)	(0.002)
Observations	1,404,417	1,404,417	1,404,417	1,404,417	1,404,417
Company FE	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes
R-squared	0.294	0.266	0.238	0.183	0.213
Outcome S.D.	0.459	0.422	0.178	0.163	0.239

Table A.10: Effect of LBOs on Performance Pay Components by Manager Status

Note: This table reports the effect of LBOs on performance pay components by manager status, using company-quarter level data. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

Table A.11: Effect of LBOs on Inequality

	Standard Deviation		90-1 Diffe	0 log rence	90-50 log Difference		
	Base pay	Total pay	Base pay	Total pay	Base pay	Total pay	
	(1)	(2)	(3)	(4)	(5)	(6)	
1(Post LBO)	0.003	0.005	0.009	0.011	0.011	0.013	
	(0.007)	(0.007)	(0.016)	(0.017)	(0.010)	(0.011)	
Observations	153,755	153,755	153,755	153,755	153,755	153,755	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.250	0.269	0.299	0.319	0.239	0.260	
Outcome Mean	0.223	0.243	0.223	0.243	0.223	0.243	

Panel A: Effect of LBOs on Within-Firm Inequality

Panel B: Interaction of LBO Effect and Firm Having Above-Median Inequality Increase

Dependent Variable: Compensation & Benefits

	Standard Deviation	90-10 log Difference	90-50 log Difference
	(1)	(2)	(3)
1(Post LBO)	-0.110**	-0.087*	-0.083*
	(0.049)	(0.051)	(0.050)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{High Ineq Delta})$	0.048	0.002	-0.005
	(0.061)	(0.062)	(0.062)
Observations	842,829	842,829	842,829
Company FE	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes
R-squared	0.356	0.356	0.356
Outcome S.D.	1.146	1.146	1.146

Table A.12: Effect of LBOs on Job Quality by Employee Tenure at Firm: Review Level

		Satisfact	ion Data			Pay Data	
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	0.024	0.033	0.039	0.036	0.017	0.057	0.007
	(0.030)	(0.026)	(0.034)	(0.036)	(0.018)	(0.222)	(0.021)
$1(Post LBO) \times 1(2-3 Years Tenure)$	-0.092***	-0.035**	-0.088***	-0.074***	-0.009	-0.033	-0.005
	(0.018)	(0.017)	(0.019)	(0.022)	(0.012)	(0.194)	(0.017)
$1(Post LBO) \times 1(4-5 Years Tenure)$	-0.136***	-0.101***	-0.134***	-0.119***	-0.006	-0.036	-0.009
	(0.024)	(0.022)	(0.023)	(0.026)	(0.014)	(0.299)	(0.026)
$1(Post LBO) \times 1(6+ Years Tenure)$	-0.114***	-0.096***	-0.145***	-0.091***	-0.025	-0.095	-0.007
	(0.031)	(0.024)	(0.031)	(0.035)	(0.016)	(0.271)	(0.023)
1(2-3 Years Tenure)	-0.136***	-0.149***	-0.179***	-0.261***	0.064***	0.733***	0.087***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.017)	(0.002)
1(4-5 Years Tenure)	-0.135***	-0.196***	-0.223***	-0.345***	0.169***	1.339***	0.150***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)	(0.025)	(0.003)
1(6+ Years Tenure)	-0.019**	-0.205***	-0.183***	-0.324***	0.351***	1.759***	0.185***
	(0.008)	(0.007)	(0.007)	(0.009)	(0.005)	(0.034)	(0.003)
Observations	2,096,944	2,101,483	2,089,274	2,074,669	907,653	907,653	907,653
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.240	0.206	0.219	0.241	0.508	0.322	0.301
Outcome S.D.	1.273	1.328	1.391	1.450	0.581	4.209	0.462

Panel A: Review Level

Table A.12: Effect of LBOs on Job Quality by Employee Tenure at Firm: Review Level-Continued

		Satisfact	ion Data		Pay Data			
	Compensation & Benefits (1)	Work-Life Balance (2)	Culture & Values (3)	Senior Management (4)	Base Earnings (5)	Variable Earnings (6)	Any Variable Earnings (7)	
1(Post LBO)	0.047	0.081**	0.074*	0.076	0.030	-0.075	-0.009	
	(0.039)	(0.034)	(0.042)	(0.047)	(0.020)	(0.301)	(0.028)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(2-3 \text{ Years Tenure})$	-0.111***	-0.068***	-0.099***	-0.091***	-0.012	0.051	0.006	
	(0.026)	(0.022)	(0.025)	(0.031)	(0.014)	(0.266)	(0.023)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(4\text{-}5 \text{ Years Tenure})$	-0.144***	-0.134***	-0.172***	-0.159***	-0.014	0.022	-0.004	
	(0.032)	(0.027)	(0.029)	(0.035)	(0.018)	(0.408)	(0.035)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(6+\text{Years Tenure})$	-0.112***	-0.108***	-0.150***	-0.099**	-0.030	-0.049	-0.003	
	(0.037)	(0.030)	(0.037)	(0.045)	(0.019)	(0.373)	(0.032)	
1(2-3 Years Tenure)	-0.141***	-0.134***	-0.173***	-0.255***	0.031***	0.751***	0.089***	
	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)	(0.018)	(0.002)	
1(4-5 Years Tenure)	-0.158***	-0.176***	-0.220***	-0.348***	0.097***	1.351***	0.150***	
	(0.006)	(0.006)	(0.007)	(0.007)	(0.003)	(0.026)	(0.003)	
1(6+ Years Tenure)	-0.075***	-0.191***	-0.206***	-0.363***	0.220***	1.779***	0.186***	
	(0.009)	(0.008)	(0.008)	(0.010)	(0.003)	(0.033)	(0.003)	
Observations	1,061,066	1,062,659	1,057,160	1,060,382	607,206	607,206	607,206	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.259	0.228	0.240	0.267	0.625	0.331	0.310	
Outcome S.D.	1.266	1.329	1.329	1.443	0.575	4.312	0.470	

Panel B: Review Level, Control for Other Worker and Job Characteristics

Note: This table reports how the effect of an LBO varies with the number of years an employee has been at the firm, using review level data. This tenure variable takes one of four values: 0-1 year, 2-3 years, 4-5 years, and more than 5 years. The interaction with 0-1 years of tenure is omitted so that the coefficient on 1(Post LBO) represents the effect for that group. Panel B further controls for other worker and job characteristics, including a job's required work experience, required education, and a worker's manager status. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

	Avg. Tenure	Avg. Req. Work Exp.	% Req. High School	% Manager	Avg. Experience	Log Reviews (Current Emps)
	(1)	(2)	(3)	(4)	(5)	(6)
1(Post LBO)	-0.024	0.014	0.003	0.005	0.147	0.020
	(0.077)	(0.032)	(0.003)	(0.004)	(0.135)	(0.015)
Observations	620,473	461,610	924,494	924,494	566,335	995,893
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.328	0.448	0.285	0.234	0.267	0.682
Outcome S.D.	4.297	1.556	0.217	0.224	6.287	0.650

Table A.13: Effect of LBOs on Reviewer Composition

Note: This table shows the effect of LBOs on reviewer composition by employee and job characteristics at the company-quarter level, including average reviewer tenure in years, average reviewer jobs' required work experience in years, % of reviewers in jobs that typically require only high school, % of reviewers with a managerial position, and log number of reviews by current employees. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

		Satisfact	tion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1(Post LBO)	-0.101**	-0.063	-0.083	-0.032	0.007	0.213	0.019	
	(0.040)	(0.041)	(0.058)	(0.049)	(0.023)	(0.158)	(0.018)	
$1(Post LBO) \times 1(High Layoff)$	-0.045	-0.047	-0.033	-0.097	-0.007	-0.252	-0.025	
	(0.055)	(0.058)	(0.091)	(0.068)	(0.031)	(0.279)	(0.032)	
Observations	844,806	846,538	756,732	837,951	478,580	478,580	478,580	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.355	0.327	0.353	0.348	0.607	0.437	0.416	
Outcome S.D.	1.146	1.170	1.278	1.323	0.510	3.503	0.391	

Table A.14: Role of Layoffs in the Effect of LBOs on Job Quality

Note: This table shows the role of layoffs in the effect of LBOs on job quality. We use company-quarter average reviews and reported pay as the dependent variable (Equation (1)). We compute layoff intensity as the difference between the average departure rate in the 4 years prior to the deal and the average departure rate in the 4 years after the deal. 1(High Layoff) indicates deals with above-median layoff intensity (1%). Employment data is from LinkedIn. All models include company and industry-quarter fixed effects. Standard errors are clustered by company. *** denotes p-value <0.01, ** denotes p-value <0.05, and * denotes p-value <0.1.

Table A.15: Effect of LBOs on Job Quality of New Hires and Former Employees

		Satisfact	tion Data		Pay Data			
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1(Post LBO)	-0.042**	-0.056**	-0.036	-0.065***	0.017	0.043	0.004	
	(0.021)	(0.024)	(0.030)	(0.025)	(0.013)	(0.091)	(0.011)	
Observations	500,531	501,719	455,935	498,066	1,405,403	1,405,403	1,405,403	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.441	0.437	0.457	0.421	0.461	0.294	0.275	
Outcome S.D.	1.137	1.225	1.329	1.296	0.579	4.180	0.459	

Panel A: Former Employee Sample

Panel B: Interaction with Whether Employee is Hired After Deal

		Satisfact	ion Data		Pay Data			
	Compensation Work-Life O		Culture &	Culture & Senior		Variable	Any Variable	
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1(Post LBO)	-0.081***	-0.044*	-0.083**	-0.058*	0.004	-0.013	0.000	
	(0.026)	(0.024)	(0.033)	(0.033)	(0.012)	(0.120)	(0.014)	
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{New Hire})$	0.059***	0.063***	0.089***	0.070***	0.006	0.076	0.005	
	(0.019)	(0.017)	(0.022)	(0.023)	(0.011)	(0.117)	(0.011)	
Observations	2,096,939	2,101,478	2,089,269	2,074,669	907,653	907,653	907,653	
Tenure FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
R-squared	0.241	0.206	0.220	0.241	0.515	0.323	0.302	
Outcome S.D.	1.273	1.328	1.391	1.450	0.581	4.209	0.462	

Note: Panel A repeats our main analysis using former employees instead of current employees. Employee reviews are assumed to be as of the employee's departure, if that is reported. Panel B shows the effect of an LBO interacted with whether the employee is hired after the deal, using review level data. We use review date, deal date, and job tenure to determine if an employee is hired after the deal. An employee is hired after the deal if the distance between the deal date and review date is longer than that employee's job tenure could be. We include tenure fixed effects to control for bias. Panel A is a company-year panel and includes company and industry-year fixed effects as we only observe an employee's year of departure. Panel B includes company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

Table A.16: Effect of LBOs on Job Quality by Deal Characteristics: Interaction Approach

Panel A: Deal Leverage

	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management
	(1)	(2)	(3)	(4)
1(Post LBO)	-0.076*	-0.054	-0.014	-0.055
	(0.040)	(0.047)	(0.066)	(0.050)
$1(Post LBO) \times 1(High Leverage)$	-0.121**	-0.130**	-0.130	-0.078
	(0.059)	(0.064)	(0.094)	(0.073)
Observations	842,903	844,632	755,134	836,066
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.356	0.327	0.353	0.349
Outcome S.D.	1.146	1.170	1.278	1.323

Panel B: Deal Type

	Compensation	Work-Life	Culture &	Senior
	& Benefits	Balance	Values	Management
	(1)	(2)	(3)	(4)
1 (Post LBO)	-0.077***	-0.037	-0.090***	-0.052*
	(0.022)	(0.023)	(0.030)	(0.027)
$1(Post LBO) \times 1(Public to Private)$	0.007	-0.030	-0.006	-0.017
	(0.046)	(0.049)	(0.068)	(0.056)
$1(Post LBO) \times 1(Corp. Divestiture)$	-0.043	-0.121**	-0.018	-0.046
	(0.049)	(0.048)	(0.066)	(0.056)
Observations	859,501	861,251	769,555	852,586
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.347
Outcome S.D.	1.145	1.170	1.277	1.323

Panel C: Deal Size

	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management
	(1)	(2)	(3)	(4)
1(Post LBO)	-0.123***	-0.062*	-0.153***	-0.053
	(0.032)	(0.035)	(0.048)	(0.041)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Large Deal Size})$	0.028	-0.050	0.096	-0.062
	(0.046)	(0.050)	(0.071)	(0.058)
Observations	847,818	849,553	759,218	840,953
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.353	0.348
Outcome S.D.	1.145	1.170	1.277	1.323

Note: This table shows the effect of LBOs on job quality by deal characteristics using an interaction approach and company-quarter level data. The coefficient on 1(Post LBO) in Panel A represents the effect for low-leverage deals. The coefficient on 1(Post LBO) in Panel B represents the effect for "vanilla" deals. The coefficient on 1(Post LBO) in Panel C represents the effect for small-size deals. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table A.17: Effect of LBOs on Job Quality by Fund ESG and Impact Status

	Satisfaction Data				Pay Data		
	Compensation Work-Life	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$1(Post LBO) \times 1(ESG/Impact Fund)$	-0.080*	-0.091**	-0.161**	-0.086	0.009	0.221	0.023
	(0.044)	(0.045)	(0.065)	(0.053)	(0.022)	(0.172)	(0.020)
$1(Post LBO) \times 1(Non-ESG/Impact Fund)$	-0.084***	-0.058***	-0.081***	-0.056**	0.016	0.070	0.007
	(0.020)	(0.020)	(0.026)	(0.023)	(0.011)	(0.098)	(0.011)
Observations	859,501	861,251	769,555	852,779	484,579	484,579	484,579
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.347	0.606	0.436	0.415
Outcome S.D.	1.145	1.170	1.277	1.323	0.510	3.504	0.391

Panel A: All ESG

Panel B: Impact Funds Only

		Satisfact	ion Data	Pay Data			
	Compensation	n Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$1(\text{Post LBO}) \times 1(\text{Impact Fund})$	-0.065	-0.001	-0.040	-0.056	-0.006	0.343	0.034
	(0.091)	(0.102)	(0.132)	(0.128)	(0.031)	(0.254)	(0.031)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{Non-Impact Fund})$	-0.084***	-0.067***	-0.096***	-0.063***	0.016	0.081	0.009
	(0.018)	(0.019)	(0.025)	(0.022)	(0.010)	(0.090)	(0.010)
Observations	859,501	861,251	769,555	852,586	484,579	484,579	484,579
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.347	0.606	0.436	0.415
Outcome S.D.	1.145	1.170	1.277	1.323	0.510	3.504	0.391

Note: This table shows the effect of LBOs on job quality for funds with different ESG statuses, using Equation (1). Panel A uses the broad ESG definition, which includes Impact funds. Panel B considers only deals led by Impact funds. The data are at the company-quarter level. ESG and Impact classification are from Preqin. All models include company and industry-quarter fixed effects. Standard errors are clustered by company. *** denotes p-value <0.01, ** denotes p-value <0.05, and * denotes p-value <0.1.

Table A.18: Post-deal Employee Satisfaction Changes and Returns Measured using TVM and PME

		Satisfact	ion Data	Salary Data					
	Compensation Work-life & Benefits Balance		bensation Work-life Culture & Senior E Benefits Balance Values Management Ear		ompensation Work-life Culture & Senior Base & Benefits Balance Values Management Earnings		Base Earnings	Variable Earnings	Any Variable Earnings?
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
log(Return)	0.077**	0.036	0.056	0.061	-0.001	0.210*	0.025**		
	(0.037)	(0.036)	(0.046)	(0.038)	(0.011)	(0.114)	(0.012)		
Observations	350	351	228	350	242	242	242		
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
R-squared	0.552	0.583	0.546	0.600	0.554	0.589	0.622		
Outcome S.D.	0.798	0.792	0.864	0.934	0.258	2.840	0.326		

Panel A: Returns Measured with Total Value Multiple

Panel B: Returns Measured with Public Market Equivalent

		Satisfaction Data					ı
	Compensation & Benefits	Work-life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings?
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
log(Return)	0.064**	0.038	0.063	0.058^{*}	-0.001	0.186	0.023*
	(0.031)	(0.034)	(0.041)	(0.033)	(0.010)	(0.119)	(0.013)
Observations	331	331	216	331	225	225	225
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.540	0.578	0.542	0.591	0.571	0.592	0.625
Outcome S.D.	0.783	0.774	0.864	0.926	0.239	2.843	0.326

Note: This table reports tests of the association between deals' gross-of-fee returns and the changes in employee reviews around the deal. The dependent variables are the change in the residualized quarterly average ratings or reported wages (as indicated in the column of the table) from the pre-deal quarters average to the post-deal quarters average. The independent variable of interest is the deal return. In Panel A [B], the return is measured as a log of 0.1 plus the deal's TVM [PME]. PMEs are computed against the style and the investee firm's industry sector of the Russell 2000 Index. The control variable are the same in both panels and include deal year fixed effects, the amounted invested, and the average rating or salary data before the deal that corresponds to the dependent variable. Standard errors are clustered the industry sub-sector of the LBO, as indicated in SPI. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table A.19: Dynamics in Association of Job Quality Changes with Investor Returns

	Compensation & Benefits		Worl Bala	Work-life Balance		ure & ues	Senior Management	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Return)	0.083		0.147		0.178		-0.290*	
	(0.191)		(0.164)		(0.166)		(0.167)	
Return Pctle		0.071		0.153		0.152		-0.219
		(0.215)		(0.220)		(0.206)		(0.222)
Observations	251	251	252	252	181	181	250	250
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.254	0.254	0.263	0.263	0.264	0.264	0.317	0.315
Outcome S.D.	0.995	0.995	1.032	1.032	1.067	1.067	1.221	1.221

Panel A: Satisfaction Changes in First 6 Months After Deal

Panel B: Satisfaction Changes in 25-48 Months After Deal

	Compensation Work-life & Benefits Balance		x-life ance	Cultı Val	ure & ues	Senior Management		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Return)	0.368**		0.150		0.278		0.219	
	(0.171)		(0.187)		(0.174)		(0.210)	
Return Pctle		0.445***		0.247		0.366*		0.337*
		(0.160)		(0.174)		(0.188)		(0.201)
Observations	245	245	246	246	177	177	244	244
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.417	0.424	0.451	0.456	0.414	0.420	0.439	0.445
Outcome S.D.	0.772	0.772	0.773	0.773	0.832	0.832	0.882	0.882

Note: This table reports tests of the association between deals' gross-of-fee returns and the changes in employee satisfaction ratings around the deal, using Equation (5). The dependent variable is the change in the residualized quarterly average rating between all pre-deal quarters and particular post-deal quarters. The independent variables are investor returns measured as the natural log of 1 plus the IRR, or percentile rank IRR calculated within the sample. The sample includes the LBOs in our main analysis, for which we observe employee reviews during the first 6 months after the deal, as well as the deal-level returns in the SPI database. Controls in all specifications include deal-year fixed effects, log of amount invested, and the pre-deal rating levels. Standard errors are clustered by SPI industry sub-sector. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table A.20: Effect of LBOs on Textual Measures from Reviewer Comments

	All		Ever-L	Ever-LBO Sample			Control Sample		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Company-Quarter Level									
Avg. Cost Cutting	1,035,351	0.00	0.02	25,105	0.00	0.03	1,010,246	0.00	0.02
Avg. Uncertainty	1,035,351	0.00	0.04	25,105	0.01	0.05	1,010,246	0.00	0.04
Avg. Layoffs	1,035,351	0.03	0.15	25,105	0.04	0.15	1,010,246	0.03	0.15
Review Level									
1(Cost Cutting)	3,718,230	0.00	0.04	138,807	0.00	0.05	3,579,423	0.00	0.04
1(Uncertainty)	3,718,230	0.00	0.06	138,807	0.00	0.07	3,579,423	0.00	0.06
1(Layoffs)	3,718,230	0.03	0.18	138,807	0.04	0.19	3,579,423	0.03	0.18

Panel A: Summary Statistics of Review Textual Measures

Panel B: Effect of LBOs on Review Textual Measures

	Cost cutting (1)	Uncertainty (2)	Layoffs (3)
1(Post LBO)	0.001***	0.002**	0.005**
	(0.000)	(0.001)	(0.002)
Observations	1,035,351	1,035,351	1,035,351
Company FE	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes
R-squared	0.101	0.141	0.160
Outcome S.D.	0.022	0.044	0.145

Note: Panel A of this table presents summary statistics on the textual measures from employee reviews. Panel B reports the effect of LBOs on textual measures from reviewer comments at the company-quarter level (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

Table A.21: Role of Layoffs in the Effect of LBOs on Employee Satisfaction: Interacted with Deal Leverage

	Compensation	Work-Life	Culture &	Senior
	& Benefits	Balance	Values	Management
	(1)	(2)	(3)	(4)
1(Post LBO)	-0.085	-0.078	-0.052	-0.071
	(0.057)	(0.060)	(0.090)	(0.073)
$1(\text{Post LBO}) \times 1(\text{High Layoff})$	0.019	0.085	0.136	0.074
	(0.086)	(0.103)	(0.156)	(0.105)
$\mathbb{1}(\text{Post LBO}) \times \mathbb{1}(\text{High Leverage})$	-0.211**	-0.186*	-0.200	-0.125
	(0.094)	(0.096)	(0.139)	(0.115)
$1(Post LBO) \times 1(High Layoff) \times 1(High Leverage)$	0.052	-0.065	0.007	-0.049
	(0.133)	(0.144)	(0.251)	(0.166)
Observations	841,325	843,052	753,854	834,493
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.356	0.327	0.353	0.349
Outcome S.D.	1.146	1.171	1.278	1.324

Note: This table shows the role of layoffs in the effect of LBOs on employee satisfaction, interacted with deal leverage. We use company-quarter average reviews as the dependent variable (Equation (1)). We compute layoff intensity as the difference between the average departure rate in the 4 years prior to the deal and the average departure rate in the 4 years after the deal. (High Layoff) indicates deals with above-median layoff intensity (1%). Employment data is from LinkedIn. 1(High Leverage) indicates deals with above-median leverage, measured as the ratio of debt to deal size. All models include company and industry-quarter fixed effects. Standard errors are clustered by company. *** denotes p-value <0.01, ** denotes p-value <0.05, and * denotes p-value <0.1.

	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management
	(1)	(2)	(3)	(4)
$1(Post) \times 1(LBO)$	-0.062***	-0.077***	-0.089***	-0.046*
	(0.020)	(0.020)	(0.027)	(0.023)
1(Post)	-0.021**	0.003	-0.025**	-0.030**
	(0.010)	(0.010)	(0.012)	(0.012)
Observations	137,105	137,199	114,828	136,520
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.309	0.273	0.303	0.271
Outcome S.D.	1.016	1.059	1.157	1.179

Table A.22: Effect of LBOs on Employee Satisfaction: Matching Estimation

Note: This table reports the effect of an LBO on employee satisfaction measures using a matching estimator. We construct the control sample using matched non-treated firms. We match each LBO target to five never-targeted companies with at least 1 review in the 3 years prior to the deal using founded year, industry, average % of reviewers with >3-year tenure (over last 3 years), average % of reviewers in jobs that typically require only high school (over last 3 years), and log number of reviews (over last 3 years). We use the Abadie and Imbens (2006) distance metric that weights each dimension by its standard deviation. We use company-quarter level data. All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value <0.01, ** denotes <0.05, and * denotes <0.1.

Table A.23: Effect of LBOs on Job Quality of Reviewers Who Rate Company on All Dimensions

	Satisfaction Data				Pay Data		
	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management	Base Earnings	Variable Earnings	Any Variable Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.082***	-0.054**	-0.088***	-0.065**	0.011	0.019	0.002
	(0.022)	(0.023)	(0.025)	(0.027)	(0.011)	(0.106)	(0.011)
Observations	757,595	757,595	757,595	757,595	421,053	421,053	421,053
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.368	0.342	0.353	0.359	0.606	0.439	0.418
Outcome S.D.	1.157	1.177	1.275	1.327	0.507	3.494	0.390

Note: This table reports the effect of an LBO on job quality measures, restricting the sample to reviewers who rate the company on all dimensions. We use company-quarter average reviews and reported pay as the dependent variable (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes < 0.05, and * denotes < 0.1.

	Satisfaction Data				Pay Data		
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.072***	-0.057***	-0.067**	-0.039	0.010	0.143	0.015
	(0.021)	(0.021)	(0.028)	(0.025)	(0.014)	(0.113)	(0.013)
Observations	370,238	370,390	318,178	368,450	168,808	168,808	168,808
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.301	0.261	0.296	0.274	0.627	0.458	0.428
Outcome S.D.	0.977	1.014	1.103	1.137	0.484	3.335	0.365

Table A.24: Effect of LBOs on Job Quality For Firms With 30 or More Reviews

Note: This table reports the effect of an LBO on job quality measures, restricting the sample to firms with at least 30 reviews. We use company-quarter average reviews and reported pay as the dependent variable (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

Table A.25: Effect of LBOs on Job Quality: Standard Errors and Median Ratings

	Satisfaction Data				Pay Data		
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.083***	-0.064***	-0.093***	-0.063***	0.015*	0.099	0.010
	(0.014)	(0.020)	(0.023)	(0.020)	(0.009)	(0.080)	(0.009)
Observations	859,501	861,251	769,555	852,586	484,579	484,579	484,579
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.347	0.606	0.436	0.415
Outcome S.D.	1.145	1.170	1.277	1.323	0.510	3.504	0.391

Panel A: Standard Errors Clustered by Quarter

Panel B: Median Ratings

	Satisfaction Data				Pay Data		
	Compensation	Compensation Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.087***	-0.051**	-0.091***	-0.062***	0.010	0.050	0.004
	(0.019)	(0.020)	(0.027)	(0.024)	(0.010)	(0.092)	(0.010)
Observations	859,501	861,251	769,555	852,586	484,579	484,579	484,579
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.353	0.321	0.347	0.343	0.603	0.427	0.408
Outcome S.D.	1.183	1.211	1.328	1.376	0.517	3.673	0.415

Note: This table reports the effect of an LBO on job quality measures, using Equation (1). Panel A uses company-quarter average reviews and reported pay as the dependent variable and clusters standard errors at the quarter level. Panel B uses company-quarter median ratings and reported pay in place of mean ratings and reported pay and clusters standard errors at the company level. All models include company and industry-quarter fixed effects. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

	Compensation & Benefits	Work-Life Balance	Culture & Values	Senior Management
	(1)	(2)	(3)	(4)
1(Post LBO)	-0.129***	-0.125***	-0.166***	-0.121***
	(0.030)	(0.031)	(0.043)	(0.038)
Observations	844,318	846,053	756,677	837,459
Company FE	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.348
Outcome S.D.	1.146	1.171	1.278	1.324

Table A.26: Effect of LBOs on Job Quality Within Return-matched Sample

Note: This table reports the effect of an LBO on job quality measures using only deals that were matched to returns. We use company-quarter average reviews and reported pay as the dependent variable (Equation (1)). All models include company and industry-quarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.

	Satisfaction Data				Pay Data		
	Compensation	Work-Life	Culture &	Senior	Base	Variable	Any Variable
	& Benefits	Balance	Values	Management	Earnings	Earnings	Earnings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(Post LBO)	-0.083***	-0.044**	-0.091***	-0.070***	0.012	0.004	-0.000
	(0.023)	(0.022)	(0.026)	(0.026)	(0.012)	(0.101)	(0.011)
Observations	849,519	851,253	761,585	842,636	480,490	480,490	480,490
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.355	0.326	0.352	0.348	0.607	0.437	0.416
Outcome S.D.	1.147	1.171	1.278	1.324	0.510	3.504	0.391

Table A.27: Effect of LBOs on Job Quality Within Deals after 2013

Note: This table reports the effort of an LBO on job quality measures using only deals that occurred after 2013. We use companyquarter average reviews and reported pay as the dependent variable (Equation (1)). All models include company and industryquarter fixed effects. Standard errors are clustered at the company level. *** denotes p-value < 0.01, ** denotes <0.05, and * denotes <0.1.