To Fire or Not to Fire? The Role of Job Security in Asset Management^{*}

Yijun Zhou[†]

Job Market Paper

Abstract

Does job security affect employees' incentives and performance, and if so, in which direction? I study the causal effect of job security in the setting of asset management and exploit a novel quasinatural experiment: When an asset management firm's external subcontractor is involved in regulatory misconduct, the firm becomes less likely to terminate its internal funds and fund managers, resulting in exogenously increased job security for fund managers inside the firm. Using a difference-in-differences approach, I find that fund managers experiencing increased job security deliver lower performance, especially those who care less about their reputation in the labor market. Furthermore, I show that the firm provides higher pay-for-performance as an imperfect substitute to incentivize employees when internal job security exogenously increases. Overall, my results suggest that higher job security disincentivizes employees and can negatively affect productivity.

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[†]INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France; E-mail: yijun.zhou@insead.edu

1. Introduction

Does job security affect employees' incentives and performance, and if so, in which direction?¹ *A priori*, the overall effect of job security is ambiguous as three conflicting views have been suggested by theory. One view argues that the provision of job security is a mutually-beneficial risk-sharing mechanism between employees and employers (Baily, 1974; Azariadis, 1975). Indeed, if the fear of job loss can induce employees to undertake value-destroying actions, then job security, by alleviating this fear, would motivate employees to act in the best interests of the firm.² The second view relies on the fact that frictions in the labor market render job termination (unemployment) an important "discipline" device (e.g., Shapiro and Stiglitz, 1984). In this context, providing job security to employees would in turn remove the disciplinary effect from termination and thus reduce their incentives to exert effort.³ Finally, the third view argues that in frictionless labor markets, job security might not even play a role in affecting employees' incentives.⁴ Overall, these conflicting views have created ambiguity that has plagued the way both firms and policymakers treat it when designing incentive structures and labor policies.

In this paper I aim to assess the causal effect of job security on employees' incentives and performance by focusing on one industry—asset management—that uniquely provides a testing ground. Traditionally, the effect of job security on employees has been difficult to identify due to two empirical challenges, one of which is the inability to observe employee behavior and performance at the individual level. The mutual fund industry is unique in that each asset

¹The level of job security is measured by the likelihood that incumbent employees can retain their jobs, which depends on the employer's costs of dismissing incumbent employees (Lazear, 1990).

²Some papers argue that the fear of job loss may induce employees to undertake value-destroying actions such as inadequate risk taking, entrenchment, and incomplete information disclosure. For example, a corporate manager who wants to enhance his own reputation earlier and boost his wages may sacrifice the long-term benefits of the firm for short-term ones. Narayanan (1985) argues that long-term job contracts can reduce managerial incentives of making short-term suboptimal decisions because the longer the duration of the contract, the more the benefit to the manager from future cash flows. Please see also Berkovitch, Israel and Spiegel (2000), Almazan and Suarez (2003), Inderst and Mueller (2005), and Njoya (2016).

³This strand of literature argues that employees who want to avoid being fired have incentives to work hard. For example, Bolton and Scharfstein (1990) argue that the commitment to terminate funding if performance is poor can induce greater effort from managers and mitigate managerial incentive problems.

⁴For example, if employees that are fired can instantly find another job with no costs, job security may not matter to employees at all. Another challenge to an active role of job security is that employers can use the employment contracts to solve the incentive problem of employees, rendering job security redundant. For example, Lazear (1981) argues that the use of seniority wages can perfectly incentivize employees.

management firm manages various funds and fund managers, whose job is to make investment decisions and deliver performance. Thus, performance of each employee is directly measurable and employee-level behavior is also observable. The second and perhaps most difficult empirical challenge is that employees' job security in a firm is endogenous, so empirical relationships between job security and employees' performance may result from reverse causality or spurious correlations. For example, within the setting of this paper—asset management—mutual funds tend to perform better in asset management firms with lower levels of manager turnover in the past, which indicates that job security may be positively correlated with employees' performance.⁵ Yet, this cross-sectional relationship does not necessarily confirm that job security induces employees to exert more effort and generate better performance. It may simply be that fund managers in some asset management firms have higher skills on average, and thus, they were not fired in the past and can deliver better performance for the firm.⁶ Therefore, identifying the causal effect of job security on incumbent employees' behavior and performance requires relating variation in their performance to exogenous variation in job security.

To achieve this goal, this paper exploits a novel quasi-natural experiment: the misconduct involvement of some asset management firms' external subcontractors, which leads to an exogenous increase in job security for incumbent employees inside these firms. In the mutual fund industry, asset management firms often outsource the management of portfolios to external subcontractors to reduce operational costs, obtain operating flexibility, and seek external expertise.^{7,8} With the existence of external subcontracting relationships, it is less costly for asset management firms to terminate internal funds because they can resort to their subcontractors and use outsourced funds to replace internal funds.⁹ However, when an asset management firm's

⁵The cross-sectional result is displayed in the appendix.

⁶Cremers and Petajisto (2009) also document that shorter manager tenure is associated with lower active shares, which predicts lower future performance. However, it may be that older fund managers have acquired more experience instead of being incentivized by job security. Thus, the positive correlation does not necessarily mean that job security induces employees to exert more effort and generate better performance.

⁷For example, the John Hancock asset management firm outsourced the management of its Classic Value Fund to an external subcontractor, Pzena Investment Management, while keeping its Fundamental All Cap Core Fund to be managed by its internal adviser, John Hancock Asset Management.

⁸The asset management firm trades off the benefits and costs of using external subcontractors and decides to outsource a fund when the benefit exceeds the cost.

⁹This intuition is supported empirically by a negative correlation between the use of subcontracting and job security inside asset management firms: Later in the paper, I show that termination likelihoods for internal funds are higher in

external subcontractor is involved in regulatory misconduct, the firm reduces its trust in the subcontractor, and in turn is less likely to delegate new funds to the subcontractor in the future. Consequently, the firm becomes less likely to terminate its internal funds and internal fund managers, resulting in exogenously increased job security for the incumbent fund managers inside the firm.^{10, 11}

Via three steps of empirical analysis, I provide evidence that fund managers experiencing increased job security exert less investment effort and deliver lower performance, which supports a disincentivizing effect of job security. In the first step, I verify that job security indeed increases in firms whose subcontractor is involved in regulatory misconduct (the treated group), compared with that in firms whose subcontractor is not involved in regulatory misconduct (the control group). Using a difference-in-differences framework, I show that the treated internal funds experience a 1.32% reduction (26% relative decrease) in the probability of termination, and moreover, fund managers managing the treated internal funds become 2.28% less likely (12% relative decrease) to be terminated. Thus, the relevance condition of my experiment is validated.

In the second step of analysis, I investigate how fund performance changes with job security. Using the same difference-in-differences approach, I compare the change in performance of the *treated* internal funds where job security increased with that of the *control* internal funds. I find that performance significantly deteriorates in the treated internal funds, suggesting that incumbent employees are disincentivized instead of being incentivized by increased job security. The magnitude of the disincentivizing effect is also economically significant: the treated internal funds experience a decrease of 19 basis points in terms of monthly return (2.3% per year), and 4 basis points in terms of monthly alpha on average compared with the control internal funds. As a robustness check, I also use the *value added* metric to measure productivity following Berk, Van Binsbergen and Liu (2017) and find that value added of the treated internal funds decreases by \$67,700 dollars per month following the positive job security shock.

firms that have established subcontracting relationships, compared with firms that have not established any subcontracting relationships.

¹⁰With the reasonable assumption of searching costs in the subcontracting market, the firm's outside option of replacing internal funds (fund managers) with outsourced funds becomes impaired, which increases the firm's cost to terminate its internal divisions. In addition, I present empirical evidence later that the affected firm does not establish more subcontracting relationships with new subcontractors in the market, supporting the existence of hiring frictions.

¹¹Because the external subcontractor is independent of the asset management firm and the firm has no control over the businesses of the external subcontractor, the subcontractor's misconduct event is exogenous to the firm and in particular, the firm's internal funds.

In addition, I estimate a dynamic version of the difference-in-differences specification to validate the assumption of parallel trends between the treated and control groups. As shown in Figure 4, there are no significant changes in performance in the treated group as compared with the control group before subcontractors' misconduct events, but immediately after the subcontractor's misconduct we observe significant decreases in performance in the treated group, which further supports my previous empirical findings. Moreover, I examine the changes in fund flows and assets managed by fund managers in the treated group to address the alternative explanation based on diseconomies of scale. As shown in Figures 5 and 6, internal funds in the treated group are not attracting more flows and fund managers in the treated group are not managing extra assets after the event compared to the control group, which is consistent with the notion that performance deterioration is driven by job security's disincentivizing effect.

Recall that one major advantage of focusing on employees in the mutual fund industry is that we can observe their investment behavior inside asset management firms, which can provide additional evidence of investment effort. The first aspect of investment behavior I examine is the extent to which the portfolio composition deviates from a benchmark in terms of sector allocation (*sector deviation*) and I argue that allocating portfolios similarly to the benchmark requires a lower level of investment discretion and less information acquisition. The second aspect I look at is the portfolio *turnover ratio* as actively changing the portfolio composition requires more effort. The results show significant decreases of both sector deviation and turnover ratios in the treated internal funds after subcontractors' misconduct events, which can be considered as direct evidence of decreased investment effort (increased shirking) and is consistent with job security's disincentivizing effect as suggested by performance deterioration.

In the third step, focusing on the link between job security and performance, I conduct heterogeneity tests to further support the disincentivizing effect of job security. While previous results show that performance deteriorates when job security increases in the treated internal funds after the subcontractor's misconduct event, the disincentivizing effect argues that performance deterioration is caused by the increase in job security. To buttress this argument, I exploit the cross-sectional variations in performance deterioration across different funds. If job security is indeed the channel that leads to shirking and performance deterioration, the negative effect in performance should be more severe in funds that are *a priori* more sensitive to job security shocks.

I look at two specific dimensions of cross-sectional variations. In the first dimension, I consider the fund manager's tenure length in the fund. The intuition is that fund managers with longer tenure lengths (old managers) are expected to be more sensitive to job security shocks, while fund managers with shorter tenure lengths (young managers) are expected to be less sensitive.¹² I test this hypothesis and find that funds experience less performance deterioration if their fund managers have shorter tenures and may care more about reputation in the labor market, while funds experience more severe performance deterioration if their fund managers have longer tenures and may care less about reputation.

In the second dimension, I consider different investment styles of internal funds. The idea is that internal funds that are of the same style as the outsourced funds managed by the firm's subcontractor can be more easily terminated and replaced by subcontracting. Consequently, following the misconduct involvement of the subcontractor, internal funds that are of the same style are subject to larger increases in job security. The results support this conjecture: the negative effects in performance are more severe in the internal funds that are of the same style as the outsourced funds managed by the misconduct-subcontractor. Therefore, these patterns of cross-sectional variations in performance deterioration support that job security is the channel that leads to performance deterioration instead of other channels that would not give rise to such cross-sectional variations.

Taken together, results from the three steps of analysis supports a disincentivizing effect of job security (Shapiro and Stiglitz, 1984): when incumbent employees' job security exogenously increases, the disciplinary effect of job termination becomes weakened, and consequently employees are disincentivized and deliver lower performance. Moreover, my findings indicate that the observed positive correlation between job security and employee performance may be spurious, which also supports the necessity of using an empirical setting with exogenous variation in job security.

Next, this paper proceeds from the asset management firm's perspective. Do affected asset management firms react to the increased job security inside the firm? In particular, how do firms react to the consequences of employees' decreased incentives and performance deterioration? To

¹²One reason can be that young managers have higher chances and incentives to join another fund or asset management firm in the future. Thus, they care more about their reputation in the labor market, which can to some extent discipline their behavior and prevent them from shirking despite the increased job security in this firm.

address these questions, I look at two potential responses from the affected asset management firms: adjusting compensation and expanding external recruitment.

Standard agency theory posits that firms can alleviate agency problems and incentivize employees by providing them with high-incentive compensation (e.g., Jensen and Murphy 1990). I find that the affected firm indeed provides higher pay-for-performance to its internal fund managers who experience an increase in job security, which provides empirical evidence that pay-for-performance and job termination are used as substitutes to incentivize employees (e.g., Hallman, Hartzell and Parsons, 2011). Moreover, I find that when job security exogenously increases, the deterioration in performance is less severe if the affected firm increases the pay-for-performance. On one hand, this finding is consistent with the argument that the performance deterioration is due to fund managers' reduced incentives; therefore, the affected firm provides more incentives through another device. On the other hand, even with high pay-for-performance as an incentive device, I still find a significant performance decrease in the treated internal funds, which further demonstrates the significance of job security's disincentivizing effect.

Beyond compensation, the second possible reaction of affected asset management firms is external recruitment. When incumbent internal fund managers are disincentivized by higher job security and deliver lower performance, the affected firms should have higher incentives to hire new fund managers. Yet, searching frictions and hiring costs in the labor market may constrain the firms from doing so. To empirically test the outcome, I compare the number of new recruits in the affected firms with that in the unaffected firms. The results show that the number of newly recruited fund managers in the affected firms does not change significantly in the first year following the subcontractor misconduct event as compared with the unaffected firms, which is consistent with the increase in job security for incumbent fund managers and supports their rationale to shirk. Meanwhile, I find that the affected firms begin to increase recruitment in the second year following the event (marginally significant) and increase further (significant) in the third year following the event, which is in line with the observation that the magnitude of the increase in job security becomes smaller gradually after the event.

As a final exercise, I conduct additional tests to alleviate potential concerns. A major concern relates to endogenous matching between asset management firms and subcontractors; specifically, that the affected asset management firms are endogenously matched to the subcontractor that will be later involved in regulatory misconduct because of certain common unobservable characteristics.¹³ To alleviate this concern, I remove from my sample the asset management firms that directly have subcontracting relationships with subcontractors that are involved in regulatory misconduct. Instead, I use the style-level indirect subcontracting shock that is generated when a subcontractor that manages outsourced funds in a certain investment style becomes involved in misconduct, which subsequently tightens the whole subcontracting market in this investment style. Under this circumstance, internal job security increases in asset management firms that have established subcontracting relationships in this market ("indirectly affected firms").14 Consistent with previous findings, more performance deterioration and less sector deviation are observed in the internal funds of these indirectly affected firms. Thus, results using the style-level indirect subcontracting shock also support a disincentivizing effect of job security. Since this set of tests is limited to the sample of asset management firms that do not have subcontracting relationships with the subcontractor involved in regulatory misconduct, the concern of endogenous matching between asset management firms and certain subcontractors is alleviated. More importantly, this evidence also helps rule out other alternative explanations that rely on direct relationships between asset management firms and the misconduct subcontractors.

To conclude, this paper has three main contributions. First, my paper contributes to the debate over the provision of job security for employees. The existing economics research on job security has mainly focused on the effect of job security provisions on the level and composition of unemployment in the labor market, aiming to help regulators decide whether to impose restrictions on employers' ability to dismiss employees.¹⁵ This paper emphasizes another important but often neglected perspective: job security provision also affects incumbent employees' incentives and performance, which can greatly impact firm productivity. In particular, this paper focuses on the

¹³For example, maybe only the asset management firms with poor governance choose to establish a subcontracting relationship with the subcontractor that will be later involved in regulatory misconduct. Then it may be argued that only in these asset management firms with poor governance can we observe employees' increased shirking behavior following the subcontractor's misconduct, while employees in other asset management firms with good governance would not shirk even if the subcontractor's misconduct happened. This argument challenges the generalization of my findings and cannot be fully addressed by the parallel trend between affected and unaffected asset management firms.

¹⁴First, asset management firms that have established subcontracting relationships in this market ("indirectly affected firms") subsequently have fewer subcontractors to employ as outside options. Second, their incumbent subcontractors who have fewer competitors may charge higher prices to manage more funds for them. Thus, asset management firms that rely on this subcontracting market have to increase their reliance on their internal funds, even though their own subcontractors are not directly involved in misconduct.

¹⁵Please see a more detailed discussion in Section II.

financial sector. Over the years, the financial sector has contributed greatly to economic growth (e.g., Philippon and Reshef, 2012; Greenwood and Scharfstein, 2013), yet compared to other sectors it is characterized by remarkably low job security. Therefore, it is important to understand whether low job security contributes to the well-functioning of the financial sector.

Second, I provide causal evidence that exogenously increased job security reduces incentives of incumbent employees, which leads to deterioration in employees' performance and harms the productivity of firms. This finding is consistent with Shapiro and Stiglitz (1984) and supports that job security does play a role in affecting employees' incentives. This disincentivizing effect of job security has implications not only to firms but also to policymakers and should be taken into consideration when designing and deciding employees' incentive contracts, labor hiring/firing policies and employment protection legislation. For example, firms can ex-ante take actions to keep internal job security at a relatively low level and prevent it from sudden increases by actively maintaining potential labor pools.

Third, I explicitly examine the interaction between job security and alternative incentive devices, which has seldom been considered in the literature, and show that when job security increases, asset management firms actively employ higher pay-for-performance as a substitution to incentivize employees.¹⁶ And even with high pay-for-performance as an incentive device, there is still evidence of significant performance deterioration following decreased job termination likelihoods, which further demonstrates the significance of job security's disincentive effect.

The remainder of the paper is organized as follows. Section II discusses the related literature. Section III provides institutional background in the mutual fund industry and explains the quasinatural experiment. Section IV presents the data employed. Section V describes the empirical analysis of how job security affects employees' performance in asset management. Section VI describes findings of how asset management firms react to the change in job security inside the firm. Section VII presents results from additional empirical tests to alleviate several additional concerns, and a brief conclusion follows in Section VIII.

¹⁶The literature has long considered compensation as the most effective device (e.g., Grossman and Hart, 1983; Gibbons and Murphy 1992), while the interaction between job security and compensation has been seldom investigated. Few exceptions include Hallman, Hartzell, and Parsons (2011), who finds that usages of pay-for-performance and job security as incentive devices are negatively correlated in real estate organizations.

2. Related Literature

This paper closely relates to the economics literature on job security. Job security of employees has been a long-standing focus of economists and policymakers: when experiencing job loss, employees suffer from wage cuts, consumption reductions, and deterioration of psychological well-being (Gibbons and Katz, 1991; Gruber, 1997; Kalil and DeLeire, 2013), resulting in significant social costs (Jahoda, 1982; Kalil and Ziol-Guest, 2008). Most of the economics papers on job security focus on how job security affects the level and composition of unemployment, the allocation of labor in the labor market, and the aggregate productivity in the economy (e.g., Bentolila and Bertola, 1990; Bertola, 1990; Dertouzos and Karoly, 1992; Hopenhayn and Rogerson, 1993; Miles, 2000; David, Donohue and Schwab, 2004; Autor, Donohue and Schwab, 2006; Boedo and Mukoyama, 2012; Hopenhayn, 2014). On the one hand, theory suggests that job security provision imposes additional adjustment costs on firms, which prevents firms from making efficient allocations of labor and capital and results in negative effects on aggregate employment and productivity (e.g., Hopenhayn and Rogerson, 1993). On the other hand, Acemoglu (2001) develops a search-based model, in which job security provision induces a shift in the composition of jobs and firms create more high-wage jobs (capital-intensive) instead of lowwage jobs. Nickell and Layard (1999) and Belot, Boone and Van Ours (2007) argue that higher job security can increase employees' firm-specific investment. From this perspective, it is argued that job security provision may increase average labor productivity and improve welfare.

Empirically, the evidence of job security's effect is also mixed. Lazear (1990) examines the various job security provisions across 22 European countries over 29 years and finds that stricter severance pay requirements are associated with lower employment. Botero, Djankov, Porta, Lopez-de-Silanes, and Shleifer (2004) investigate labor regulations in 85 countries and provide cross-country evidence that wealthier countries regulate labor less than poorer countries do. On the other hand, Bertola (1990) finds that job security provisions do not bias labor demand toward lower average employment at given wages, nor do they bias wage determination toward higher wages, arguing that job security provisions should not be blamed for high unemployment rates in European countries. Nickell and Layard (1999) find a positive cross-sectional correlation between job security and productivity in countries. However, these cross-sectional correlations cannot be regarded as causal evidence. To identify how job security causally affects unemployment, several

papers exploit the passage of wrongful discharge laws that leads to exogenous increases in job security. Again, mixed evidence is found in the labor market. Dertouzos and Karoly (1992) find that the adoption of wrongful discharge laws leads to a 3% reduction in aggregate employment, while Miles (2000) finds no statistically significant effects of job security provision on either employment or unemployment.

Several recent studies also exploit the adoption of wrongful discharge laws, but they examine job security's effects on productivity and are more related to this paper. For example, Autor, Kerr, and Kugler (2007) examine establishment-level data from the Annual Survey of Manufacturers and the Longitudinal Business Database and find that following the adoption of the wrongfuldischarge law, firms not only experience a decline in total factor productivity, but also experience a rise in labor productivity due to capital deepening. Acharya, Baghai, and Subramanian (2013) focus on innovation and argue that job security can enhance employees' innovative effort and encourage firms to invest in risky projects. The authors find that in states that passed wrongful discharge laws, more firms are created, and existing firms experience a rise in the annual number of patents and citations. Although these papers are very related to the present paper, these empirical findings do not give a clear answer to this paper's main question: how does job security affect employees' incentive and performance? This is because they are focusing on the aggregate firmlevel productivity, which is determined by not only the effort paid by incumbent employees but also the re-allocation decision of the firm. For example, the rise in innovation documented in Acharya, Baghai, and Subramanian (2013) may be partially driven by the fact that firms become more able to attract employees with high abilities to innovate when job security increases. Without examining the employee-level data, it is impossible to disentangle the effect from the intensive margin and the extensive margin. Therefore, the aim of my paper is to examine how job security affects employee-level incentives, which can contribute to our understanding of this less-wellstudied link between employment protection and productivity.

As this paper focuses on job security of asset managers, it also adds to the block of literature on asset management, in particular, literature that focuses on employees in asset management. Many papers have studied how economic incentives, especially compensation structures, affect asset managers' investment behavior. For example, Brown, Harlow, and Starks (1996) find that mid-year losers tend to increase fund volatility in the latter part of an annual assessment period in an attempt to maximize the expected compensation. Huang, Sialm, and Zhang (2011) also argue that agency problems may help explain risk shifting by mutual fund managers. Different from these papers, I focus on how a special component in compensation structures, the likelihood of future job terminations, affects fund managers' incentives and performance. Another related paper is Chevalier and Ellison (1999), which also examines the implicit incentives created by fund manager terminations but with a special focus on fund managers' age. They show that younger fund managers are more likely to be terminated and that younger fund managers conduct more herding. Cremers and Petajisto (2009) also document that shorter manager tenure is associated with lower active shares. However, fund managers' age and tenure are correlated with many factors in addition to job security, so their findings based on age or tenure cannot answer how a marginal increase or decrease of job security affects fund managers' incentives and behavior, which is the aim of this paper. Several papers also examine fund manager terminations but proceed from a different perspective. For example, Khorana (1996) and Kostovetsky and Warner (2015) study the determinants of fund manager turnover and find that fund manager turnover is negatively dependent on past fund performance. Khorana (2001) shows that the performance in a fund reverses when a new manager replaces the previous underperforming manager. Gervais, Lynch, and Musto (2005) proceed from a learning perspective and argue that asset management firms fire a fraction of managers to maintain or improve the reputation of other remaining managers inside. Ellul, Pagano, and Scognamiglio (2018) focus on the outcome of terminations on hedge fund managers' future career and compensation. They find that fund managers who underperformed and were terminated suffer from demotion and compensation reductions, which supports my assumption that fund managers indeed care about terminations.

Among the asset management literature, this paper also relates to several studies on the misconduct by investment advisors and institutions. There are some papers examining the impact of misconduct on investors. For example, Zitzewitz (2006), Choi and Kahan (2007) and Chapman-Davies, Parwada, and Tan (2014) document that investors react to the scandal of mutual funds by withdrawing money. Gurun, Stoffman, and Yonker (2017) provide further evidence that investors suffering from delegated managers' misconduct transfer money from the risky delegated investment towards safer banks. Several other papers focus on the pattern of misconduct. For example, Dimmock and Gerken (2012) find that advisors with past record of misconduct are more likely to engage in new misconduct in the future. Charoenwong, Kwan, and Umar (2019) show that investment advisors are more likely to engage in misconduct if state regulators have fewer

resources. There also exist some papers that examine fraud in hedge funds, such as Brown, Goetzmann, Liang, and Schwarz (2008), and Bollen and Pool (2012). Other related paper are Anton and Polk (2014) and Koch, Ruenzi and Starks (2016), which uses a specific series of mutual fund scandals as a natural experiment to generate exogenous variations in common ownership and liquidity. Distinct from these studies, this paper focuses on the subcontractor's misconduct event and uses it as an identification strategy, which has not been examined nor exploited before.

Finally, this paper is related to the recent literature on labor and finance that regards labor as an essential factor in finance. Belo, Lin, and Bazdresch (2014) study the impact of labor market frictions on asset prices and find that labor-hiring decisions are linked to firms' risk premiums. Belo, Li, Lin, and Zhao (2017) further show that the labor force is an important factor in determining the equilibrium risk premiums in the cross-section. Meanwhile, the corporate finance literature also recognizes labor considerations as an important determinant of corporate policies. For example, Agrawal and Matsa (2013) present evidence that firms choose conservative financial policies partly to mitigate workers' exposure to unemployment. Dou, Khan and Zou (2016) find that firms manage long-run earnings upward to manage employees' perception of employment security. Serfling (2016) presents evidence that labor firing costs crowd out financial leverage via increasing financial distress costs. Dessaint, Golubov, and Volpin (2017) find that an increase in employment protection leads to fewer takeover activities, arguing that labor restructuring is a key driver of takeovers. Bertrand, Hsieh, and Tsivanidis (2015) study how the supply of contract labor contributes to firms' productivities in the presence of labor firing costs. This paper contributes by highlighting the impact of labor factors on the performance of mutual funds and linking labor considerations with the firm's organization structures (e.g., external subcontracting relationships).

3. Institutional Background and the Quasi-natural Experiment

3.1. Subcontracting in the mutual fund industry

In the mutual fund industry, all mutual funds belong to an asset management firm. The asset management firm, similar to firms in other industries, decides firm strategies in the market, has control over all the divisions within the firm, actively monitors its employees, and makes capital and labor allocation decisions in the internal market (e.g., Massa, 2003; Gervais, Lynch and Musto, 2005; Berk and van Binsbergen, 2017).

Instead of solely relying on internal employees, an asset management firm can choose to outsource the management of portfolios to external subcontractors. For example, the asset management firm, John Hancock, outsourced the management of its Classic Value Fund to an external subcontractor, Pzena Investment Management, while keeping its Fundamental All Cap Core Fund to be managed by its internal adviser, John Hancock Asset Management. Typically, asset management firms use subcontractors to reduce operational costs, obtain operating flexibility, seek external expertise, and gain market shares (e.g., Chen, Hong, Jiang, and Kubik, 2013; Chuprinin, Massa, and Schumacher, 2015; Massa and Schumacher, 2017; Moreno, Rodriguez, and Zambrana, 2018). Yet at the same time the firm boundaries also impose difficulties in monitoring external subcontractors and decide to outsource a fund when the benefit exceeds the cost. Since 2005, more than 20% of mutual funds in the U.S. industry are outsourced funds managed by external subcontractors and most of the large asset management firms have external subcontractors.

3.2. The subcontractor's regulatory misconduct

Subcontractors of asset management firms, referred to as investment advisers, are required to register with the SEC and are subject to supervision from various regulatory authorities. An investment adviser can provide financial advice on portfolio management, financial planning and transactions for different participants in the financial market, including mutual funds, hedge funds, pension funds, and households.

According to Egan, Matvos and Seru (2019), 7% of financial advisers have misconduct records in the financial market. Misconduct of investment advisers are usually violations of fiduciary duties or the Investment Advisers Act, including conducting unauthorized trading, providing inappropriate investment advice, disclosing insufficient information, and producing accounting errors. Once a regulatory misconduct case is initiated, by the SEC or the corresponding state regulators, the investment adviser will usually incur substantial settlement costs and reputational damage.

In this paper, I focus on regulatory misconduct by investment advisers who provide subcontracting services to asset management firms in the mutual fund industry. Recall that this paper exploits the misconduct involvement of subcontractors as an exogenous shock to job security inside the asset management firm. The misconduct event usually does not directly involve the outsourced fund that the subcontractor manages for the asset management firm. For example, the asset management firm, Marshall Funds Inc. used to employ BPI Global Asset Management LLP as a subcontractor to provide portfolio management services. In 2003, BPI's major holding company was accused of failing to protect the best interests of the relevant funds and allowing some institutional investors to conduct market-timing activities. Following the misconduct event, the outsourced funds managed by BPI experienced significant outflows due to BPI's reputation damage, resulting in a sudden drop of assets in the outsourced funds belonging to Marshall Funds Inc., which makes the assets managed by its internal divisions relatively more important for Marshall Funds Inc. Meanwhile, Marshall Funds Inc. would lessen its trust in BPI, and thus, is less likely to delegate new funds to BPI in the future. With reasonable assumptions that there are costs to searching for another external subcontractor and costs to establishing a subcontracting relationship with another subcontractor, Marshall Funds Inc. cannot easily replace the role of BPI with another subcontractor in the subcontracting market. Thus, the outside option for Marshall Funds Inc. is impaired, and consequently it would be less likely to terminate its internal funds and internal fund managers, leading to an increase in job security for internal fund managers in Marshall Funds Inc. Since BPI belonged to another firm that Marshall Funds Inc. had no control over, the misconduct event can be regarded as exogenous to Marshall Funds Inc.

Therefore, I regard the internal funds in asset management firms (e.g., Marshall Funds Inc.) whose subcontractor (e.g., BPI) is involved in regulatory misconduct as the treated group while considering the internal funds in other asset management firms whose subcontractors are not involved in the misconduct as the control group, which is represented in Figure 1.

4. Data

4.1. Data sources

The data used in this paper mainly come from four databases: N-SAR filings for mutual funds from the U.S. Securities and Exchange Commission (SEC), Form ADV of investment advisers, the CRSP Mutual Fund Database, and the Morningstar Mutual Fund Database.

Mutual funds are required to file N-SAR forms with the SEC semi-annually under the Investment Company Act of 1940. The N-SAR filings contain 133 items and provide detailed information about the investment advisers and advisory contract for each fund, which is not available in other mutual fund databases. I collect a total of 213,722 N-SAR files from the SEC EDGAR database from 1996 to 2016 and parse all the variables using a natural language processing technique. A main variable used later in this paper—advisory compensation—is also extracted from N-SAR forms following the literature (Coles, Suay, and Woodbury, 2000; Deli, 2002; Deli and Varma, 2002; Massa and Patgiri, 2008).

Having identified the adviser of each fund from the N-SAR filings, I need to link advisers to the ones in Form ADV to obtain their business affiliations and historical misconduct events. In the U.S., all investment advisers must file a Form ADV to disclose information required under the Investment Adviser Act of 1940. I collect all of the historical Form ADVs dating back to 2001 and obtain all the business affiliations and historical misconduct cases for each investment adviser each year.

To connect the N-SAR filings and Form ADV, I first use the common SEC identification number, if available, to match two databases following Debaere and Evans (2016). Even though this step is able to match a large number of filings, there are still many unmatched filings because of missing SEC identification numbers in either N-SAR or Form ADV. Therefore, I apply a machine learning technique (Gradient Boosted Decision Trees) to match the remaining filings by their legal names and take advantage of the labeled training sample from the first step that combines investment adviser names from both databases. I train a machine learning model using the matched sample and predict a matching score for each pair of unmatched investment advisers. The matching score ranges from zero to one, with the probability of a correct match increasing with the value. I keep the pairs of investment advisers with matching scores higher than 0.9 and manually check the accuracy of the second step. With matched information from N-SAR filings and Form ADV, I classify each fund as an internal fund or outsourced fund managed by unaffiliated external subcontractors.

The CRSP Mutual Fund Database is the most commonly used database in the mutual fund literature and it contains numerous fund characteristics such as fund size and fund returns. Because there is no common identifier to merge N-SAR filings with the CRSP Mutual Fund Database, I match mutual funds by the names that are in similar formats in both databases ("trust name: fund name, class"). I apply the machine learning model again using previous training data together with more manually labeled matching samples. Then following the literature, I group the multiple classes of an individual fund together by weighting each class by its TNA. Finally, I match the CRSP and Morningstar Mutual Fund Database by the fund ticker available in both databases and obtain more fund characteristics, such as Morningstar fund investment objectives and styles, and fund manager identities.

4.2. Summary statistics

From the above data sources, I identify a total of 141 subcontractor misconduct events. Figure 2 reports the frequency of misconduct events from 2001 to 2016. The number of events peaked from 2003 to 2005, when the late trading scandal emerged (e.g., Zitzewitz, 2006). Table 1 provides summary statistics of the asset management firms and the internal funds in my sample. Internal funds in firms whose subcontractor is involved in regulatory misconduct are the "treated internal funds". Internal funds in firms whose subcontractor is not involved in regulatory misconduct are the "control internal funds".

5. Subcontractors' Misconduct Events, Job Security, and Performance

In this section, I test the effect of job security on employees' performance in asset management. My empirical design relies on the idea that the subcontractor's regulatory misconduct involvement generates an exogenous increase in job security for incumbent employees inside the asset management firm, which is discussed and supported with empirical evidence in the first subsection. I first show that the use of subcontracting is indeed negatively correlated with job security inside the firm. Then, I illustrate that a firm's subcontracting relationship is impaired by its subcontractor's involvement in regulatory misconduct and verify that job security indeed increases for the firm's internal employees following the subcontractor's involvement in regulatory misconduct. Next, in the second sub-section I investigate how performance changes in the treated internal funds when employees' job security increases following the subcontractor's regulatory misconduct involvement. The results show that the treated internal funds experience a decrease of 19 basis points in terms of monthly return, and 4 basis points in terms of monthly alpha on average, which suggests job security's disincentivizing effects on employees. Finally in the last part of this section, I exploit the cross-sectional variations in performance deterioration across different funds and find that performance deterioration is more severe in funds that are *a priori* more sensitive to job security shocks, which further supports the argument that the performance deterioration is caused by the increase in job security.

5.1. Subcontracting and job security

Is job security inside the firm correlated with the firm's external subcontracting? For asset management firms with established subcontracting relationships with external subcontractors, it may be less costly to terminate internal funds because they can resort to their subcontractors and use outsourced funds to replace internal funds. Even though a firm's cost to terminate internal funds is neither observable nor measurable, we can actually observe the realized termination likelihood of internal funds in the firm. Therefore, I examine termination likelihoods of internal funds in different firms, and the results show that the termination likelihood inside the firm is indeed negatively correlated with the firm's subcontracting relationships.

To study such correlations, I compare the termination likelihood in asset management firms that have established subcontracting relationships with that in firms that have not established any subcontracting relationships by estimating the following regression:

Fund closure_{*i*,*f*,*t*} =
$$\alpha + \alpha_t + \beta * Subcontracting_{f,t-1} + \gamma X_{i,t-1} + \delta Z_{f,t-1} + \varepsilon_{i,f,t}$$
 (1)

where subscript *i* indicates an internal fund, and subscript *f* indicates the firm that the internal fund belongs to. The dependent variable is a closure indicator variable that is equal to one if the internal fund is terminated at time *t*. Subcontracting_{*f*,*t*-1} is the main variable of interest that measures the level of external subcontracting in the firm. In column (1), it is an indicator that is equal to one if the firm has external subcontracting relationships at time t - 1. In columns (2) and (3), it is measured by the firm's number or percentage of outsourced funds managed by external

subcontractors. $X_{i,t-1}$ is a vector of fund-level control variables, and $Z_{f,t-1}$ is a vector of firmlevel control variables. The results are reported in Table 2, which shows that the correlations between a firm's use of external subcontracting and the termination likelihoods of internal funds in the firm are positive and significant. Job security for internal funds is lower in firms that have established subcontracting relationships, compared with job security in firms that do not have any subcontracting relationships. Thus, the result supports that shocks to subcontracting are related to job security inside the firm.

Next, I investigate the consequences of subcontracting shocks on outsourced funds managed by misconduct subcontractors. When the subcontractor is involved in regulatory misconduct, the subcontractor suffers from a reputational penalty, which may affect the outsourced funds managed by the subcontractor and the subcontracting relationship. To examine the effects, I first estimate the following regression:

Consequences on outsourced funds_{*j*,*f*,*t*} =
$$\alpha + \alpha_j + \alpha_t + \beta(Affected \times Post) + \gamma X_{j,t-1} + \delta Z_{f,t-1} + \varepsilon_{j,f,t}$$
 (2)

where subscript *j* indicates an outsourced fund; α_j and α_t are fund and time fixed effects, respectively. *Affected* is an indicator variable that is equal to one if the subcontractor of the outsourced fund is involved in regulatory misconduct and is equal to zero if the subcontractor of the outsourced fund is not involved in regulatory misconduct. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. $X_{j,t-1}$ is a vector of fund level control variables, and $Z_{f,t-1}$ is a vector of firm level control variables.

The results are reported in Table 3, where the dependent variable in column (1) is fund flow, and the dependent variable in column (2) is a closure indicator variable that is equal to one if the outsourced fund is terminated. The dependent variable in column (3) is an indicator variable that is equal to one if the outsourced fund is changed into an internal fund. The results show that the affected outsourced funds that are managed by subcontractors involved in misconduct experience a 25% increase in fund outflows on average, compared with those unaffected outsourced funds that are managed by not-involved subcontractors. Moreover, the asset management firm becomes more likely to terminate some of the affected outsourced funds. The affected outsourced funds experience a 1.85% increase in termination likelihoods compared with unaffected outsourced funds

funds. But the affected asset management firm does not increase the likelihood to change the outsourced fund into an internal fund as shown in column (3), which may be due to the internal managers' limited capacity to manage additional assets or due to the firm's concern of reputation spillovers from the misconduct subcontractor. These results suggest that when investors are withdrawing money from the affected outsourced funds, the firm trades off the benefit and cost of running these affected outsourced funds, and thus, is more likely to choose to terminate them. The assets under management in the external division shrink and the firm has fewer outsourced funds. Consequently, the firm has to rely more on incumbent internal funds in terms of the scale of assets under management, so the internal division is of greater significance for the firm, which is expected to decrease the termination likelihoods inside the firm.

In Table 4 I report the result of a similar analysis focusing on the subcontracting relationship between firms and subcontractors. The result shows that an asset management firm is more likely to terminate a subcontractor that is involved in misconduct. Moreover, consistent with the existence of searching costs and costs to establish relationships in the subcontracting market, I find that the affected firm does not establish more subcontracting relationships with new subcontractors in the market. Therefore, the subcontractor's misconduct event impairs the outside option of the affected asset management firm, which is also expected to increase job security in the firm's internal divisions.

Finally, I verify that the subcontractor's misconduct event indeed results in increased job security for internal employees by investigating the termination likelihoods inside the firms following the subcontracting shock. In a difference-in-differences framework, I compare the termination likelihood between internal funds in firms whose subcontractor is involved in regulatory misconduct (treated internal funds) with those in firms whose subcontractor is not involved in regulatory misconduct (control internal funds) before and after the event. The following regressions are estimated:

Fund closure_{*i*,*f*,*t*} =
$$\alpha + \alpha_i + \alpha_t + \beta$$
(Treated × Post) + $\gamma X_{i,t-1} + \delta Z_{f,t-1} + \varepsilon_{i,f,t}$ (3)

$$Mgr termination_{m,f,t} = \alpha + \alpha_m + \alpha_t + \beta(Treated \times Post) + \gamma X_{m,t-1} + \delta Z_{f,t-1} + \varepsilon_{m,f,t}$$
(4)

where subscript i indicates an internal fund, subscript m indicates an internal fund manager, and subscript f indicates the firm that the internal fund belongs to. In regression (3) the dependent variable is a closure indicator variable that is equal to one if the internal fund is terminated. In regression (4) the dependent variable is a termination indicator variable that is equal to one if the fund manager is terminated from the firm. *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund (manager) belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. α_i , α_m and α_t are fund, manager, and time fixed effects, respectively. $X_{i,t-1}$ is a vector of fund-level control variables, and $Z_{f,t-1}$ is a vector of firm-level control variables. *X*_{m,t-1} is a vector of manager-level control variables, such as the size and return of the fund that is managed by the manager. If the manager is managing more than one fund, I use the sum of fund sizes and the average of fund returns as control variables.

The results, reported in Table 5, provide direct evidence for increased job security inside the firm following its subcontractor's involvement in regulatory misconduct. First, internal funds in the asset management firm whose subcontractor is involved in regulatory misconduct experience a 1.32% reduction of termination likelihood after the event on average, compared with internal funds in asset management firms whose subcontractors are not affected (column 1). Since the unconditional likelihood of fund termination is less than 5%, this magnitude is of nontrivial economic significance. Second, the result in column (2) shows that the internal fund manager becomes 2.28% less likely to be terminated from the firm after its subcontractor's involvement in regulatory misconduct. Given that the unconditional likelihood of fund manager termination is around 19%, this magnitude is equal to a 12% relative decrease in termination likelihood.

I also validate the existence of parallel trends between the treated group and the control group in terms of their termination likelihoods. Following Autor (2003), I estimate a dynamic version of the difference-in-differences specification by including the leads and lags of the treatment into specifications (3) and (4). The coefficients are not significantly different from zero in the three years before the subcontractors' involvement in misconduct and become negative and significant afterwards. In Figure 3 I present the change in manager termination likelihoods in the treated internal funds around the subcontractor misconduct events. It shows that the differences in termination likelihoods between the treated and control groups are very stable during the three years before the event, while job security in the treated internal funds increases significantly immediately following the experiment. Therefore, the results further support that the subcontractor's misconduct generates an exogenous increase in job security inside the firm.

5.2 Performance in treated internal funds

Having verified that job security in the treated internal funds indeed increases, I proceed to test the effect of job security by examining the performance in a difference-in-differences framework. I investigate how performance changes in the internal funds of the asset management firm whose subcontractor is involved in misconduct by estimating the following regression.

$$Performance_{i,f,t} = \alpha + \alpha_i + \alpha_t + \beta(Treated \times Post) + \gamma X_{i,t-1} + \delta Z_{f,t-1} + \varepsilon_{i,f,t}$$
(5)

The dependent variable *Performance* is measured by both the monthly fund return (net of expenses) and the fund alpha estimated from a Fama-French 3-factor model. *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. α_i and α_t are fund and time fixed effects, respectively. $X_{j,t-1}$ is a vector of control variables, and $Z_{f,t-1}$ is a vector of firm-level control variables.

The results are displayed in Table 6. The coefficients of the interaction term are negative and significant, meaning that performance deteriorates in the treated internal funds after the misconduct event, compared with performance in the control internal funds. The magnitude of performance deterioration is also of economic significance. The treated internal funds experience a decrease of 19 basis points in terms of monthly return, and 4 basis points in terms of monthly alpha on average. In Figure 4, I verify the parallel trend assumption by including leads and lags of the treatment in the difference-in-differences specification (5). As seen in Figure 4, the coefficients are almost zero in the three years before subcontractors' misconduct events and become negative and significant afterwards. That is, the treated internal funds and control internal funds do not experience significant changes in the patterns of performance during the three years before the event, while performance decreases significantly in the treated internal funds immediately following the experiment.

These results suggest that job security has a disincentivizing effect on employees. Increased job security disincentivizes employees and induces them to shirk; therefore, we observe significant performance deterioration in the treated internal funds. Moreover, the findings indicate that the positive correlation between job security and employees' performance inferred from the cross-sectional analysis is spurious. Even though performance tends to be higher in asset management firms with a lower level of manager turnover in the past, it does not necessarily mean that job security leads to better performance, which supports the necessity of exploiting an experiment to study the effect of job security.

An alternative explanation of this finding is based on diseconomies of scale. As shown earlier, when an asset management firm's subcontractor is involved in regulatory misconduct, the firm's outsourced funds that are managed by the subcontractor experience significant outflows. If these fund outflows flow into the internal funds of the asset management firm, internal funds in the treated group would become larger, and fund managers in the treated group would manage extra assets after the event, in which case performance may deteriorate due to diseconomies of scale instead of increased shirking by fund managers. Since my results are based on the difference-indifferences framework, which compares the difference between the treated internal funds and the control internal funds, this alternative explanation is based on the assumption that fund outflows disproportionally flow into the treated internal funds as compared with the control internal funds. Even though the assets under management and the fund flows have been controlled for in regressions, to provide more direct evidence against this alternative explanation I compare fund flows and assets managed by fund managers in the treated group with those in the control group in a difference-in-differences framework with the leads and lags of the treatment included. Point estimates from the regression are plotted in Figures 5 and 6, which shows that there are no significant changes in the difference between the treated and control groups following the event. Internal funds in the treated group are not attracting more flows and fund managers in the treated group are not managing extra assets after the event compared to the control group. Thus, these results can help rule out this alternative explanation and support the notion that performance deterioration is more likely to be driven by job security's disincentivizing effect.

Recall that one advantage of the mutual fund industry is that we can observe the investment behavior of fund managers in each fund, which can provide additional evidence of investment effort; thus, I examine how investment behavior changes following the misconduct event. The purpose is to further test whether fund managers are disincentivized by increased job security as suggested by performance deterioration in the treated internal funds. The first aspect of investment behavior I examine is *sector deviation*, which measures the extent to which the portfolio composition deviates from a benchmark in terms of sector allocation. The intuition is that, allocating portfolios similarly to the benchmark requires a lower level of investment discretion and less information acquisition, while on the contrary, more deviation requires more information acquisition and more costly effort. The second aspect I look at is the portfolio *turnover ratio*, and I argue that actively changing the portfolio composition requires more effort.

I conduct the same difference-in-differences analysis as in equation (5) and use *sector deviation* (in columns 1 and 2) and *turnover ratio* (in columns 3 and 4) as dependent variables. *Sector deviation* is the square root of the sum of the squared differences between a fund's portfolio weighting in each of the industry sectors and the mean sector weights in the fund's investment objective class (benchmark) in that year. The results in Table 7 show that the portfolio composition of the treated internal funds in terms of the industry sector allocation deviates 1.93% less from its benchmark and the turnover ratio decreases by 0.0312 after the event on average, which is evidence of decreased investment effort. It is indicated that after the subcontractor's misconduct event, internal fund managers that are exogenously endowed with increased job security turn over their portfolios less frequently and allocate their portfolios. The finding suggests that fund managers with higher job security shirk more and exert a lower level of effort in their task of making investment decisions, which is consistent with the documented performance deterioration in the treated funds.

5.3. Cross-sectional analysis

The results from my analysis thus far show that performance deteriorates when job security increases in the treated internal funds after the subcontractor's misconduct event, while the disincentivizing effect argues that performance deteriorates because of the increase in job security. To support this argument, I exploit the cross-sectional variations in performance deterioration across different funds. If job security is the channel that leads to shirking and performance deterioration, the negative effect in performance should be more severe in funds that are *a priori* more sensitive to job security shocks.

I look at several specific dimensions of cross-sectional variations. In the first dimension, I focus on the fund manager's tenure length in the fund. Fund managers that have shorter tenure in the fund (young managers) should care more about their reputation in the labor market as they have higher chances and incentives to join another fund or asset management firm in the future, which can to some extent discipline their behavior and prevent them from shirking despite the increased job security in this firm. On the contrary, fund managers that have longer tenure in the fund (old managers) should have lower incentives to build their reputation and join another firm. Thus, fund managers with longer tenure lengths should be more sensitive to job security shocks, while fund managers with shorter tenure lengths should be less sensitive to job security shocks.

To test this hypothesis, I divide all internal funds into two groups based on their fund managers' tenure length in the fund and conduct the same analysis as before. The results are presented in Table 8. The dependent variable *Performance* is measured by both the monthly fund return in columns (1) and (2) and the fund alpha estimated from a Fama-French 3-factor model in columns (3) and (4). In the sub-sample of the long tenure group (old managers), the treated internal funds experience a decrease of 27 basis points in terms of monthly return (t-statistic -3.59) and a decrease of 9 basis points in terms of monthly alpha (t-statistic -2.76) as shown in columns (2) and (4). While in the sub-sample of the short tenure group (young managers), the magnitude of the deterioration in performance is much smaller where the treated internal funds experience a decrease of 13 basis points in terms of monthly return (t-statistic -2.95) and insignificant decrease in terms of monthly alpha (t-statistic -1.52) as shown in columns (1) and (3).

Therefore, the results are consistent with the hypothesis that performance deteriorates more severely in funds that should be more sensitive to an increase in job security. Specifically, funds experience less performance deterioration if their fund managers have shorter tenures and may care more about reputation in the labor market, while funds experience more severe performance deterioration if their fund managers have longer tenures and may care less about reputation in the labor market. The pattern of cross-sectional variations in performance deterioration supports that job security is the channel that leads to performance deterioration.

In the second dimension, I scrutinize the cross-sectional variations across internal funds of different investment styles. The assumption is that, different fund managers and subcontractors may have expertise in different investment styles, thus, internal funds that are of the same style as

the outsourced funds managed by the firm's subcontractor can be more easily terminated and replaced by subcontracting. However, when the subcontractor is involved in misconduct, the firm's option to replace internal funds by subcontracting decreases, especially for internal funds belonging to the same investment styles where the subcontractor has expertise. Therefore, internal funds that are of the same style are affected by job security shocks to greater extents compared to other internal funds that are of different styles, which may consequently lead to heterogenous effects in performance.

Empirically, I estimate a triple difference-in-differences specification by interacting the *treated* dummy and the *post* dummy with the *same style* dummy. The *same style* dummy is equal to one if the internal fund is in the same style as the outsourced funds managed by the misconduct-subcontractor, and zero otherwise. As we can see from Table 9, the coefficients of the interaction term between the *treated* dummy and the *post* dummy are negative and significant, and the coefficients of the triple interaction term are also negative and significant. Specifically, the treated internal funds that do not belong to the affected style on average experience a decrease of 10 basis points in terms of monthly return (t-statistic -1.97), while the treated internal funds that belong to the affected style on average of 18 basis points in terms of monthly return (t-statistic -5.07). Thus, consistent with the hypothesis, the negative effects in performance are more severe in the internal funds that are of the same style as the outsourced funds managed by the misconduct-subcontractor as these same-style funds are affected by job security shocks to greater extents.

Finally, I examine the cross-sectional variations at the asset management firm level. I consider the situation that asset management firms in my sample may vary in their degree of reliance on external subcontracting. Consequently, they will be exposed to different degrees of increases in internal job security following subcontractors' misconduct and will experience heterogeneous levels of internal performance deterioration. To investigate this possible cross-sectional variation, I divide asset management firms into two groups based on their reliance on external subcontracting in the previous year, which is measured by the percentage of TNA managed by external subcontractors. If an asset management firm was relying more heavily on subcontracting, internal job security would increase by a larger extent following the subcontractor's misconduct. The same difference-in-differences analysis is conducted in two groups separately. The results are consistent with the conjecture and are presented in Table 10, where the results for firms with low reliance on subcontracting are shown in columns (1) and (3), and the results for firms with high reliance on subcontracting are shown in columns (2) and (4). In the sub-sample of firms that rely less on subcontracting, the treated internal funds experience a decrease of 10 basis points in terms of monthly return (t-statistic -1.97) and 2 basis points in terms of monthly alpha (t-statistic -1.75). On the other hand, the deterioration in performance is more significant in the sub-sample of firms that rely more on subcontracting where the treated internal funds experience a decrease of 22 basis points in terms of monthly return (t-statistic -3.61) and 9 basis points in terms of monthly alpha (t-statistic -4.49). Therefore, internal funds in asset management firms that rely more on subcontracting experience while internal funds in asset management firms that rely more on subcontracting experience while internal funds in asset management firms that rely more on subcontracting experience a smaller decrease in performance while internal funds in asset management firms that rely more on subcontracting experience more severe performance deterioration, indicating a positive relationship between the increase in job security and the degree of performance deterioration.

6. Subcontractors' Misconduct Events and Firms' Reactions

My results so far indicate that when job security increases in the firm's internal funds after the subcontractor's misconduct event, internal fund managers are disincentivized and deliver lower performance, which supports job security's disincentivizing effect instead of the incentive effect. Meanwhile, other questions may arise from the asset management firm's perspective: Do the affected asset management firms react to the increased job security inside the firm? In particular, how do they react to employees' decreased incentives and performance deterioration? In this section, I address these questions and look at two potential responses from the affected asset management firms: adjusting compensation and expanding external recruitment.

6.1 Pay-for-performance as a substitute

Since Jensen and Murphy (1990), one of the most important devices to incentivize employees is considered to be performance pay, which is to relate their compensation to performance. If firms can alleviate agency problems by providing employees with high-incentive compensation, it may

offset employees' tendency to shirk when job security increases and the discipline effect of job termination decreases. Therefore, I examine whether firms react to job security's disincentivizing effect by adjusting employees' compensation and test their effects in preventing performance deterioration.

Empirically, it is difficult to observe the actual pay received by each fund manager. However, it is relatively easy to observe the compensation pay that the asset management firm pays to the adviser of each fund. This advisory pay decides the amount of compensation that each fund manager can obtain and has been used as a proxy for the pay of fund managers (Coles, Suay, and Woodbury, 2000; Deli, 2002; Deli and Varma, 2002; Massa and Patgiri, 2008). Therefore, I extract the advisory compensation data of each fund from its N-SAR forms in the SEC EDGAR database, which contains the compensation rate that the asset management firm pays to the adviser of each fund for the amount of assets under management. Since fund flows and assets under management are positively related to fund performance, advisory pay can be considered as the pay-for-performance, which provides incentives for fund managers to generate better performance in the fund. I investigate how the affected asset management firm adjusts the pay-for-performance by estimating the following difference-in-differences regression:

 $Pay_for_performance_{i,f,t} = \alpha + \alpha_i + \alpha_t + \beta(Treated \times Post) + \gamma X_{i,t-1} + \delta Z_{f,t-1} + \varepsilon_{i,f,t}$ (6) where the dependent variable *Pay-for-performance* is measured by both the weighted rate and the

marginal rate from the advisory compensation contract of each fund.

The results are displayed in Table 11. I find that the affected asset management firm whose subcontractor is involved in misconduct event provides 0.0052% more pay-for-performance to incentivize its internal fund managers who experience an increase of job security after the event. The results suggest that the asset management firm employs pay-for-performance as a substitute for job insecurity/termination to incentivize employees (e.g., Hallman, Hartzell and Parsons, 2011). Even though the 0.0052% does not seem to be substantial as compared with the average compensation rate of 0.63%, this amount is still of nontrivial economic significance because the rate applies to the total assets under management in the fund. Since the assets under management in internal funds is more than \$1 billion dollars on average, the increased pay amounts to over \$50,000 in an individual fund per year. To support the parallel trend assumption and examine the dynamics of pay-for-performance, I estimate a dynamic version of the difference-in-differences

specification. The result validates the parallel trend assumption, showing that the coefficients are not significantly different from zero in the three years before subcontractors' misconduct events. Meanwhile, the results show that the coefficients become positive and significant after the event, while the increase of pay-for-performance only occurs in the second year after the event instead of immediately. This may be due to the friction of adjusting the advisory pay promptly in the asset management firm organization.

Meanwhile, there is another question regarding pay-for-performance as an incentive device: can high pay-for-performance help prevent employees from shirking and alleviate internal funds' performance deterioration when internal job security increases in affected asset management firms? To examine how employees' compensation affects their reactions to changes in job security, I reestimate the equation (5) by interacting the *treated* dummy and the *post* dummy with a *compensation increase* dummy, which is equal to one if the asset management firm increases the pay-for-performance in the fund after the misconduct event, and zero otherwise. The results are presented in Table 12. The coefficients of the triple interaction term are positive and significant, meaning that performance deterioration is less severe if the pay-for-performance is increased. Specifically, the monthly return in the treated group experiences a decrease of 23 basis points on average if the pay-for-performance is not increased, but if the pay-for-performance is increased, the monthly return only experiences a decrease of 5 basis points on average if the pay-for-performance is not increased of 5 basis points on average if the pay-for-performance is not increased, but the monthly return only experiences a decrease of 2 basis points in the treated group if the pay-for-performance is not increased.

When job security exogenously increases, the deterioration in performance is less severe in funds with increased pay-for-performance and is more severe in funds without increased pay-for-performance. The result supports that high pay-for-performance can indeed help alleviate performance deterioration following the increase in job security. Moreover, this is consistent with the fact that performance deterioration is due to fund managers' reduced incentives, thus, firms try to provide more incentives through other incentive devices. However, even with high pay-for-performance we still observe significant performance deterioration in the treated internal funds, which further demonstrates the significance of job security's disincentivizing effect.

6.2 New recruitment

Following the subcontractor's misconduct event, job security increases inside the firm and internal fund managers are disincentivized, which results in performance deterioration. Besides providing higher pay-for-performance to incentivize incumbent employees, the affected asset management firm may also resort to external recruitment. This can be motivated by the needs to replace the role of subcontractors, to reduce the level of job security for existing fund managers, and to restore the disciplinary effect. However, the existence of searching frictions and hiring costs in the labor market constrain the firm's from doing so.

To examine whether asset management firms react by using external recruitment, I focus on the number of new recruits in each firm and use the same difference-in-differences approach. I examine the difference in new recruits between the affected firms and unaffected firms after the event, compared with their difference before the event. The results are presented in Table 13. Asset management firms with more assets and more funds under management are found to hire more new fund managers. However, the number of newly recruited fund managers in the affected firms does not significantly increase after the subcontractor misconduct event as compared with the unaffected firms. This is consistent with the existence of frictions in the hiring market such that asset management firms cannot easily find and hire new fund managers from the labor market. Moreover, it explains why job security increases for existing fund managers and supports their rationale to shirk.

Even though overall new recruitment does not increase significantly in the three years following the subcontractor's misconduct, I further investigate the firm's reactions each year by including the leads and lags of the treatment in the dynamic difference-in-differences specification. As shown in column 2 of Table 13, there is no significant change in external recruitment in the affected asset management firms in the first year after the subcontractors' misconduct event. Nevertheless, the affected firms begin to increase the number of new recruits in the second year after the event, while it is only marginally significant at the 10% level. New recruitment is further increased in affected firms in the third year after the event compared with that in unaffected firms, and the increase is significant at the 5% level. The results indicate that, even though frictions in the hiring market hinder the surge of new recruitment, the affected asset management firms seem to gradually increase the hiring of new fund managers. More importantly, the gradual increase of

new recruitment is also in line with the observation that the magnitude of the increase in job security becomes smaller gradually after the event, implying that the level of job security inside affected firms does not remain high permanently.

Finally, I examine the profiles of the newly recruited managers. On one hand, the affected firms should have higher incentives to hire better managers as not only their external subcontracting relationship is impaired, but also their existing managers are disincentivized and shirking. They need managers with high abilities to not only help the firm improve performance but also to re-establish the competitiveness in the internal labor market. On the other hand, the affected asset management firms may be more desperate in hiring new managers and may lower their hiring standards because of the performance deterioration inside the firm. As it is difficult to predict which forces dominate ex-ante, I compare the profiles of new managers recruited by the affected firms with those recruited by the unaffected firms in a difference-in-differences framework. Specifically, I focus on the length of experience of newly recruited managers in the mutual fund industry and their past performance in managing funds. The results in Table 14 show that the newly recruited fund managers in the affected asset management firms tend to have longer industry experience and have marginally better past performance. The affected firms indeed seem to try to hire better fund managers despite frictions in the labor market, which can also help explain why external recruitment does not increase significantly following the subcontractor's misconduct event.

7. Additional Tests

In this section, which is comprised of two sub-sections, I present results of additional tests to further support my findings.

7.1. Indirect style-level subcontracting shocks

A concern of my empirical strategy is that there is endogenous matching between an affected asset management firm and its subcontractor who would later be involved in regulatory misconduct due to certain common unobservable characteristics. For example, an asset management firm with poor governance endogenously chooses an external subcontractor that is also poorly governed. Consequently, internal employees in such a firm are more likely to shirk and exert lower effort when the firm's subcontractor is involved in misconduct. Counterfactually, employees in other unaffected firms that have better governance would not shirk even when their external subcontractors were involved in misconduct.

Even though the parallel trend between affected and unaffected asset management firms can partially alleviate this concern, I provide more direct empirical evidence by removing from my samples the asset management firms that directly have subcontracting relationships with the subcontractors that are involved in regulatory misconduct. Instead, I exploit the indirect style-level subcontracting shock that tightens the subcontracting market in this investment style, which is generated when a subcontractor that manages outsourced funds in a certain investment style becomes involved in misconduct. Under this circumstance, asset management firms that have established subcontracting relationships in this market subsequently have fewer subcontractors to employ as outside options. Meanwhile, their incumbent subcontractors who have fewer competitors may charge higher prices to manage more funds for them. Thus, asset management firms that rely on this subcontracting market have to increase their reliance on their internal funds, even though their own subcontractors are not directly involved in misconduct. On the contrary, other asset management firms that have not established any subcontracting relationships in this market are unaffected (or affected to a lesser extent) by the style-level subcontracting shock. Therefore, job security exogenously increases in internal funds belonging to asset management firms that are affected by the style-level indirect subcontracting shock, compared with internal funds belonging to asset management firms that are not affected (Figure 7).

Exploiting the indirect style-level subcontracting shock, I conduct a difference-in-differences analysis with newly constructed treated and control groups. Internal funds in asset management firms that experience indirect subcontracting shocks are the treated group, while internal funds in asset management firms that do not experience any indirect subcontracting shocks are the control group. I examine how performance and investment behavior in treated internal funds are affected when job security exogenously increases. Consistent with the disincentivizing effect of job security documented in the main findings, these results also demonstrate evidence of increased shirking in treated internal funds where exogenously increased job security are provided to fund managers (see Table 15). Specifically, the treated group experiences a decrease of 9 basis points in terms of

monthly return, and 2 basis points in terms of monthly alpha on average. As expected, the magnitude of the disincentivizing effect following the indirect subcontracting shock is smaller than that shown in the main results. Meanwhile, the portfolio composition of the treated funds in terms of industry sector allocation deviates 1.26% less from the benchmark after the indirect subcontracting shock, which also suggests that treated fund managers are disincentivized and are less likely to conduct independent investments with their own efforts.

In particular, the analysis with the indirect subcontracting shock is conducted with the sample of asset management firms that do not have subcontracting relationships with the misconduct subcontractors. Thus, the concern of an endogenous matching between asset management firms and certain subcontractors is alleviated. Furthermore, the evidence can help alleviate other alternative explanations that also rely on the direct relationships between asset management firms and the misconduct subcontractors, such as information sharing between the asset management firm and the subcontractor.

7.2. Investment restrictions on funds

Another alternative explanation of performance deterioration in the treated group is that the affected asset management firms may impose more investment restrictions on funds after experiencing the subcontractor's misconduct events. In this section, I consider this alternative explanation by directly examining whether the affected asset management firms tighten their policies on funds' investment practices.

The data is extracted from each fund's N-SAR form. Question 70 of the N-SAR form requires each fund to disclose whether a specific investment practice is permitted by the policy and whether the fund engages in the practice during the reporting period. Following Almanzan et al. (2004), I focus on two categories of investment practices: (1) using leverages (including borrowing of money, margin purchases, and short selling), and (2) using derivatives (including writing or investing in options and futures). In the same difference-in-differences framework I examine how the investment practices change after the event in the affected asset management firms, compared with the unaffected asset management firms.

The results are presented in Table 16, showing that there is no significant change in investment restrictions in the affected asset management firms. The coefficients of the interaction terms are

insignificant. The affected firms do not adjust permissions on their internal funds' usage of leverages nor derivatives as shown in columns (1) and (3), respectively. The internal funds in the treated group do not show significant change in their usage of leverages and derivatives as shown in columns (2) and (4), respectively. Therefore, the alternative explanation based on firms' increased investment restrictions is not supported by empirical findings in the section.

7.3. Four robustness tests

Finally, four robustness tests are conducted. The first robustness test is to deal with the concern that internal funds with poor past performance in the control group are terminated after the subcontractor's misconduct event, therefore, the relative performance deterioration in the treated group is driven by performance improvements in the control group where underperforming funds are terminated and excluded after the event. On the one hand, this concern is based on an assumption that terminated funds would underperform survived funds if terminated funds were not terminated, which does not necessarily hold. On the other hand, I directly alleviate the concern by reconducting the analysis with only survived funds in both the treated and control groups. Specifically, I only keep a fund-year observation in my sample if the fund would not be terminated in the following three years, then I compare the treated group with the control group in the difference-in-differences framework.

The results are reported in Table 17, where significant performance deterioration is still observed in the treated internal funds after the misconduct event, compared with that in the control internal funds. Specifically, the treated internal funds experience a decrease of 18 basis points in terms of monthly return, and 4 basis points in terms of monthly alpha on average, which is of similar magnitude compared with the main results. Thus, this test with a sub-sample of survived funds supports that performance deterioration in the treated internal funds is not driven by the terminated funds in the control group.

As the second robustness test, I consider the value added measure used by Berk, Van Binsbergen and Liu (2017). The value added measure is defined as the fund return in excess of the benchmark multiplied by the fund size, which captures the productivity of the fund for the asset management firm. Even though my previous analysis is conducted using fund returns and alphas as measures of performance, conceptually, there should not be significant differences between

these measures in my empirical framework. This is because I am examining how performance changes in the treated internal funds following the job security shock with fund fixed effects included. However, using the value added measure can provide us with a better understanding of the magnitude of job security's effect in terms of dollar value. Thus, I conduct the same difference-in-differences analysis as in equation (5) and use the value added of each fund each month as dependent variables.

The results are reported in Table 18. Fund and time fixed effects are included in all specifications, with fund-level controls added in column (2) and additional firm-level controls added in column (3). As we can see from the table, the coefficients of the interaction term are negative and significant. It means that value added of the treated internal funds decreases after the misconduct event compared with that of the control internal funds, which is consistent with performance deterioration documented in previous sections. Moreover, I find that the decrease in value added of the treated internal funds can amount to \$67,700 dollars per fund per month (column 3). Thus, this result further demonstrates that exogenously increased job security disincentivizes employees and can significantly harm firm productivity.

The third robustness test is to deal with the concern that the results are driven by the cluster of subcontractor's misconduct events from 2003 to 2005, which is followed by the financial crisis in 2007 and 2008. Therefore, I exclude that cluster of subcontractor's misconduct event and reconduct the analysis of Table 6 with the sub-sample period starting from 2009. The results are displayed in Table 19, which demonstrates significant performance deterioration in the treated group following the job security increase. Moreover, the performance deterioration estimated with the sub-sample after the crisis is of greater economic significance, which indicates that job security's disincentivizing effect may be larger when the market condition is better.

As the fourth robustness test, I examine the performance deterioration separately in solo-managed funds and co-managed funds. The internal funds are divided into two groups based on whether the fund is managed by a single manager or is managed by multiple managers. I re-conduct the analysis and the results are shown in Table 20. As we can see, performance deteriorates significantly in both types of funds, while the magnitude of performance deterioration is slightly larger in the co-managed funds. This result indicates that employees may be more disincentivized by increased job security when they are taking fewer independent responsibilities.

8. Conclusion

This paper sheds light on the ambiguity as to whether job security provided by a firm incentivizes or disincentivizes employees to exert effort and deliver performance. Empirically this paper relies on the mutual fund industry as a laboratory, as this industry is one of the few sectors in the economy where employee-level performance is measurable and employees' investment behavior is observable. To identify the causal effect of fund managers' job security, I exploit a novel quasi-natural experiment: the misconduct involvement of some asset management firms' external subcontractors. When an asset management firm's external subcontractor is involved in regulatory misconduct, the firm increases its reliance on the internal funds and fund managers, leading to an exogenous increase in job security for incumbent employees inside the firm.

By comparing internal funds in the firm whose subcontractor is involved in regulatory misconduct with those in firms whose subcontractor is not involved in regulatory misconduct, I show in a difference-in-differences framework that fund managers experiencing increased job security are disincentivized and deliver lower performance. Moreover, I find that the asset management firm uses higher pay-for-performance as an imperfect substitute to incentivize employees when job security exogenously increases. Performance deterioration is less severe in funds if the asset management firm increases the pay-for-performance. Finally, I use a style-level indirect shock to rule out some alternative explanations and deal with endogeneity concerns. Using this shock, I remove from my sample the asset management firms that directly have subcontracting relationships with the subcontractors who are involved in misconduct and find evidence consistent with the disincentivizing effect.

To conclude, the central contribution of this paper is to provide causal evidence that exogenously increased job security disincentivizes employees, which is consistent with Shapiro and Stiglitz (1984) and supports that job security does play a role in affecting employees' incentives. In addition, even though this paper documents job security's disincentivizing effect by focusing on asset management, employees in this industry usually receive high wages and incentive pay that already provide them with high incentives to exert effort. Thus, job security's disincentivizing effect may be even larger in other industries where employees are disciplined by terminations rather than incentivized by high-powered compensation. Findings of this paper have implications not only for firms but also for policymakers when designing and deciding employees'

incentive contracts, labor hiring/firing policies, and employment protection legislation (e.g., Epstein, 1984; Levine, 1989; Yermack, 2006; Rau and Xu, 2013).

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Figure 1: The subcontractor's misconduct events

This figure illustrates the design of the quasi-natural experiment. In the mutual fund industry, asset management firms often outsource the management of portfolios to external subcontractors. These two circles below represent two distinct asset management firms, where the one in the left represents an *affected asset management firm* and the one in the right represents an *unaffected asset management firm*. An asset management firm is defined as an affected (unaffected) firm if the firm's subcontractor is (not) involved in regulatory misconduct. The firm's outsourced funds that are managed by the subcontractor are defined as *affected outsourced funds*. Internal funds in the affected asset management firm are defined as *treated internal funds*, while internal funds in unaffected asset management firms are defined as *control internal funds*.



Figure 2: The subcontractors' misconduct events (Frequency)

This figure reports the frequency of misconduct events from 2001 to 2016. A misconduct event is identified when an asset management firm's subcontractor is involved in regulatory misconduct in the year. The sample includes a total number of 141 subcontractor misconduct events.



Figure 3: Effect of subcontractors' misconduct on job security

This figure reports the effect of subcontractors' misconduct on job security around the event dates. The specification is the same as in Table 5 except the *post* dummy is replaced by a collection of variables *subcontractor-misconduct* (t + x), which is an indicator that is equal to one if it is *x*-year after (or before if *x* is negative) the misconduct. Point estimates from the regression are plotted, with the solid line plotting the 95% confidence interval. Point estimates represent the change in manager termination likelihoods in the treated internal funds in each year around the misconduct year (t = 0), compared with that in the control internal funds.



Year relative to subcontractors' misconduct

Figure 4: Effect of subcontractors' misconduct on performance

This figure reports the effect of subcontractors' misconduct on fund performance around the event dates. The specification is the same as in Table 6 except the *post* dummy is replaced by a collection of variables *subcontractor-misconduct* (t + x), which is an indicator that is equal to one if it is *x*-years after (or before if *x* is negative) the misconduct. Point estimates from the regression are plotted, with the solid line plotting the 95% confidence interval. Point estimates represent the change in monthly returns in the treated internal funds in each year around the misconduct year (t = 0), compared with that in the control internal funds.



Year relative to subcontractors' misconduct

Figure 5: Effect of subcontractors' misconduct on fund flows

This figure reports the effect of subcontractors' misconduct on fund flows around the event dates. The specification is the same as in equation (3) but the dependent variable is the fund flow and the *post* dummy is replaced by a collection of variables *subcontractor-misconduct* (t + x), which is an indicator that is equal to one if it is *x*-years after (or before if *x* is negative) the misconduct. Point estimates from the regression are plotted, with the solid line plotting the 95% confidence interval. Point estimates represent the change in fund flows in the treated internal funds in each year around the misconduct year (t = 0), compared with that in the control internal funds.



Year relative to subcontractors' misconduct

Figure 6: Effect of subcontractors' misconduct on assets managed by internal managers

This figure reports the effect of subcontractors' misconduct on assets managed by internal fund managers around the event dates. The specification is the same as in equation (4), but the dependent variable is the asset managed by internal fund managers, and the *post* dummy is replaced by a collection of variables *subcontractor-misconduct* (t + x), which is an indicator that is equal to one if it is *x*-years after (or before if *x* is negative) the misconduct. Point estimates from the regression are plotted, with the solid line plotting the 95% confidence interval. Point estimates represent the change in assets managed by internal fund managers in the treated group, in each year around the misconduct year (t = 0), compared with that in the control group.



Year relative to subcontractors' misconduct

Figure 7: Style-level indirect shocks

This figure illustrates the design of the style-level indirect shock, which is generated when a subcontractor that manages outsourced funds in a certain investment style (S_T) is involved in misconduct. When using the style-level indirect shocks, I remove from my sample the asset management firms that directly have subcontracting relationships with the subcontractors that are involved in regulatory misconduct. The treated group includes the internal funds in style S_T that belong to *indirectly-affected* firms that have established subcontracting relationships in this subcontracting market of investment style S_T . The control group includes the internal funds in style S_T that belong to *unaffected* firms that have not established any subcontracting relationships in this subcontracting market.



Table 1: Summary statistics

This table presents the characteristics of asset management firms (Panel A) and characteristics of firms' internal funds (Panel B). Affected firms are the firms whose subcontractor is involved in regulatory misconduct, and unaffected firms are the firms whose subcontractor is not involved in regulatory misconduct. Treated internal funds are the internal funds in affected firms, and control internal funds are the internal funds in unaffected firms.

| Panel A: Asset Management Firm Characteristics | | |
|---|----------------|------------------|
| | Affected firms | Unaffected firms |
| # of firm-year observations | 464 | 2228 |
| | | |
| Average firm size (log \$ million) | 8.83 | 7.58 |
| | | |
| Average # of funds | 32.61 | 21.03 |
| | | |
| Average # of funds managed by external subcontractors | 11.02 | 6.10 |
| | | |
| Panel B: Fund Characteristics | | |
| Treated internal funds | (10017 Fun | d-Year Obs) |
| | Mean | Std. Dev. |
| Fund size (log \$ million) | 5.76 | 2.09 |
| | 10.55 | 10.51 |
| Fund age (years) | 13.57 | 10.51 |
| European Datio | 0.910/ | 0.400/ |
| Expense Rauo | 0.0170 | 0.4970 |
| Monthly return | 0.46% | 4 74% |
| | 0.4070 | 7.7770 |
| Fund flows | 39.77% | 238.68% |
| | | |
| Control internal funds | (33189 Fun | d-Year Obs) |
| | Mean | Std. Dev. |
| Fund size (log \$ million) | 5.28 | 1.95 |
| | | |
| Fund age (years) | 13.00 | 10.34 |
| | | |
| Expense Ratio | 0.94% | 0.51% |
| | | |
| Monthly return | 0.45% | 4.77% |
| | | |
| Fund flows | 36.95% | 238.90% |

Table 2: Correlation between internal job security and subcontracting

This table examines whether job security in internal funds of the firm is related to the firm's use of subcontracting. The sample contains internal funds in all asset management firms, including the firms that have subcontractors and the firms that do not have subcontractors. The dependent variable is a closure indicator variable that is equal to one if the internal fund is terminated. *Use of subcontracting* is an indicator variable that is equal to one if the firm uses subcontracting to manage outsourced funds, and zero otherwise. Time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Fund closure dummy | | | |
|-----------------------------------|--------------------|------------|------------|--|
| | (1) | (2) | (3) | |
| Use of subcontracting | 0.0067*** | | | |
| | (5.13) | | | |
| # of outsourced funds in the firm | | 0.0002*** | | |
| | | (5.65) | | |
| % of outsourced funds in the firm | | | 0.0173*** | |
| | | | (3.79) | |
| Fund TNA | -0.0127*** | -0.0126*** | -0.0125*** | |
| | (-27.37) | (-27.74) | (-27.53) | |
| Fund return | -0.0962*** | -0.0951*** | -0.0948*** | |
| | (-18.75) | (-19.12) | (-19.03) | |
| Fund flow | -0.0012*** | -0.0009*** | -0.0009*** | |
| | (-6.30) | (-5.84) | (-5.84) | |
| Fund expense ratio | 0.0770 | 0.0894 | 0.0998 | |
| - | (0.47) | (0.56) | (0.62) | |
| Fund management fee | -0.0009* | -0.0009* | -0.0009* | |
| | (-1.75) | (-1.76) | (-1.76) | |
| Firm TNA | 0.0012** | 0.0016*** | 0.0015*** | |
| | (2.26) | (3.26) | (3.06) | |
| # of funds in the firm | -0.0000*** | -0.0000*** | -0.0000*** | |
| | (-3.21) | (-4.24) | (-2.75) | |
| Time FE | Yes | Yes | Yes | |
| N | 70855 | 70855 | 70855 | |
| R-sq | 0.032 | 0.032 | 0.032 | |

Table 3: Subcontractor-misconduct events and outsourced funds

This table examines when a firm's subcontractor is involved in misconduct, how outsourced funds managed by the subcontractor are affected. The sample only includes outsourced funds. The dependent variable in (1) is fund flow, and the dependent variable in (2) is a closure indicator variable that is equal to one if the outsourced fund is terminated. The dependent variable in (3) is an indicator variable that is equal to one if the outsourced fund is changed into an internal fund. *Affected* is an indicator variable that is equal to one if the subcontractor is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Fund flow | Fund closure | Change to internal |
|---|-------------|--------------|--------------------|
| | | dummy | funds |
| | (1) | (2) | (3) |
| Affected outsourced funds * Post subcontractor-misconduct | -0.2565*** | 0.0185** | -0.0002 |
| | (-3.58) | (1.96) | (-0.05) |
| Fund TNA | -0.7542*** | -0.0221*** | -0.0066*** |
| | (-18.95) | (-9.25) | (-2.87) |
| Fund return | 0.5459*** | -0.0249** | -0.0157 |
| | (7.95) | (-2.07) | (-0.79) |
| Fund flow | -0.0098 | -0.0007 | -0.0005 |
| | (-1.55) | (-1.20) | (-0.79) |
| Fund expense ratio | -62.8715*** | 3.5308*** | 1.9147* |
| | (-6.29) | (2.66) | (1.66) |
| Fund management fee | 0.0011 | -0.0019*** | -0.0001 |
| | (0.70) | (-5.36) | (-0.88) |
| Firm TNA | 0.0349 | -0.0068* | -0.0024 |
| | (1.51) | (-1.92) | (-0.75) |
| # of funds in the firm | 0.0009 | -0.0002* | 0.0007*** |
| | (1.34) | (-1.65) | (5.27) |
| Time FE | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes |
| Ν | 16167 | 16236 | 16236 |
| <u>R-sq</u> | 0.465 | 0.386 | 0.083 |

Table 4: Subcontractor-misconduct events and subcontracting relationships

Panel A examines whether a subcontractor's existing subcontracting relationship with the firm is affected when the subcontractor is involved in misconduct. The dependent variable in column (1) is a termination indicator variable that is equal to one if the firm terminates the existing subcontracting relationship with the subcontractor, and zero otherwise. *Affected* is an indicator variable that is equal to one if the subcontractor is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Panel B examines whether the firm establishes new subcontracting relationships when a firm's existing subcontractor is involved in misconduct. The dependent variable in column (2) is the number of new subcontractor is involved in regulatory misconduct, and zero otherwise. Time fixed effects are included in both regressions, together with fund and firm level controls. Column (1) includes subcontractor fixed effects and column (2) includes firm fixed effects. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Panel A: | | Panel B: | |
|--|---------------|---|----------------|
| Dependent Variable: | Subcontractor | Dependent Variable: | New |
| | termination | | subcontractors |
| | (1) | | (2) |
| Affected subcontractor * Post subcontractor-misconduct | 0.0755** | Affected firm * Post subcontractor-misconduct | 0.1952 |
| | (1.96) | | (0.36) |
| Firm TNA managed by the subcontractor | -0.0648*** | Firm TNA | 0.4773*** |
| | (-14.73) | | (4.25) |
| The subcontractor's average management fee | 0.0008*** | # of subcontractor of the firm | -0.1443** |
| | (3.28) | | (-2.49) |
| The subcontractor's average flow | -0.0000 | # of funds in the firm | -0.0581 |
| | (-0.61) | | (-0.84) |
| The subcontractor's average return | -0.2044*** | # of investment objective in the firm | 0.0854 |
| | (-4.15) | | (0.55) |
| # of funds in the firm | -0.0004 | The firmr's average return | 0.1564 |
| | (-0.55) | | (0.74) |
| Firm TNA | 0.0796*** | The firmr's average management fee | 0.0001 |
| | (7.61) | | (0.66) |
| # of subcontractor of the firm | 0.0015 | The firm's average flow | 0.0207 |
| | (1.32) | | (1.08) |
| Time FE | Yes | Time FE | Yes |
| Subcontractor FE | Yes | Firm FE | Yes |
| Ν | 7193 | Ν | 2692 |
| R-sq | 0.263 | R-sq | 0.227 |

Table 5: Job security in treated internal funds

This table examines whether job security in internal funds of the firm is affected when its subcontractor is involved in misconduct. The sample only includes internal funds in asset management firms that have subcontractors. In column (1), the dependent variable is a closure indicator variable that is equal to one if the internal fund is terminated. In column (2), the dependent variable is a termination indicator variable that is equal to one if the internal fund manager is terminated from the asset management firm. *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Time fixed effects are included, together with fund and firm level controls. Fund fixed effects and fund manager fixed effects are included in columns (1) and (2), respectively. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Fund closure | Manager termination |
|--|--------------|---------------------|
| | (1) | (2) |
| Treated internal funds * Post subcontractor-misconduct | -0.0132*** | -0.0228*** |
| | (-3.42) | (-4.70) |
| Fund TNA | -0.0221*** | 0.0157 |
| | (-12.66) | (1.26) |
| Fund return | -0.0505*** | -0.0144*** |
| | (-6.65) | (-7.53) |
| Fund flow | -0.0003 | 0.0002*** |
| | (-1.02) | (3.73) |
| Fund expense ratio | 4.4647*** | 4.3584*** |
| | (4.58) | (4.56) |
| Fund management fee | -0.0005 | 0.0022** |
| | (-0.33) | (2.54) |
| Firm TNA | -0.0067 | -0.0008 |
| | (-1.46) | (-0.44) |
| # of funds in the firm | -0.0001 | -0.0001 |
| | (-1.63) | (-1.49) |
| Time FE | Yes | Yes |
| Fund/Mgr FE | Yes | Yes |
| N | 33813 | 49855 |
| <u>R-sq</u> | 0.341 | 0.296 |

Table 6: Performance in treated internal funds

This table examines whether performance in internal funds of the firm is affected when its subcontractor is involved in misconduct. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable is monthly return in columns (1) and (2) and is monthly alpha in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthl | Monthly return | | ly alpha |
|--|------------|----------------|-----------|------------|
| - | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0016*** | -0.0019*** | -0.0003** | -0.0004*** |
| | (-4.71) | (-4.73) | (-2.14) | (-3.12) |
| Fund TNA | | -0.0022*** | | -0.0014*** |
| | | (-15.67) | | (-29.27) |
| Fund return | | -0.0113*** | | -0.0022*** |
| | | (-9.00) | | (-3.83) |
| Fund flow | | 0.0000 | | -0.0000 |
| | | (1.23) | | (-0.77) |
| Fund expense ratio | | 0.1054 | | 0.0159 |
| | | (1.50) | | (0.74) |
| Fund management fee | | 0.0001 | | 0.0001*** |
| | | (0.89) | | (5.34) |
| Firm TNA | | 0.0009*** | | 0.0000 |
| | | (2.59) | | (0.37) |
| # of funds in the firm | | 0.0000*** | | 0.0000*** |
| | | (4.24) | | (3.81) |
| Extra TNA managed by mgr | | -0.0001 | | 0.0000 |
| | | (-0.77) | | (0.11) |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 340214 | 340214 | 300788 | 300788 |
| R-sq | 0.049 | 0.050 | 0.151 | 0.163 |

Table 7: Investment behavior in treated internal funds

This table examines whether investment behavior in internal funds of the firm is affected when its subcontractor is involved in misconduct. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable in columns (1) and (2) is *sector deviation*, which measures the degree in which the fund's portfolio composition in terms of industry sectors deviates from its investment objectives each year. The dependent variable in columns (3) and (4) is *turnover ratio* of the portfolio. *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Sector of | Sector deviation | | ver ratio |
|--|------------|------------------|-----------|------------|
| - | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0197*** | -0.0193*** | -0.0335** | -0.0312*** |
| | (-8.5) | (-7.41) | (-2.46) | (-2.77) |
| Fund TNA | | -0.0012 | | -0.0292*** |
| | | (-1.09) | | (-4.81) |
| Fund return | | -0.0065 | | -0.0668** |
| | | (-0.99) | | (-2.16) |
| Fund flow | | 0.0001 | | -0.0015 |
| | | (0.28) | | (-0.99) |
| Fund expense ratio | | 0.9992 | | 12.6195*** |
| | | (1.42) | | (4.18) |
| Fund management fee | | -0.0007 | | -0.0013 |
| | | (-1.54) | | (-1.18) |
| Firm TNA | | -0.0070*** | | 0.0109 |
| | | (-2.73) | | (1.03) |
| # of funds in the firm | | -0.0001*** | | 0.0001 |
| | | (-3.89) | | (0.82) |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 27010 | 27010 | 28602 | 28602 |
| R-sq | 0.651 | 0.666 | 0.759 | 0.771 |

Table 8: Performance deterioration and fund manager tenure

This table examines when a firm's subcontractor is involved in misconduct, whether the effect on the performance of internal funds varies with the fund manager's tenure in the fund. The sample only includes internal funds in asset management firms that have subcontractors. Funds are divided into two groups based on their fund managers' tenure length in the fund. The dependent variable is the monthly return in columns (1) and (2) and is the monthly alpha in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | | Monthl | y alpha |
|--|----------------|------------|------------|------------|
| Group based on the manager's tenure length: | Young | Old | Young | Old |
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0013*** | -0.0027*** | -0.0002 | -0.0009*** |
| | (-2.95) | (-3.59) | (-1.52) | (-2.76) |
| Fund TNA | -0.0038*** | -0.0019*** | -0.0015*** | -0.0011*** |
| | (-16.07) | (-11.29) | (-22.30) | (-17.25) |
| Fund return | -0.0110*** | -0.0136*** | 0.0063*** | -0.0056*** |
| | (-5.63) | (-9.38) | (7.66) | (-10.73) |
| Fund flow | -0.0000 | 0.0002*** | 0.0000 | 0.0000*** |
| | (-0.46) | (4.46) | (0.66) | (3.81) |
| Fund expense ratio | -0.2995** | 0.2827*** | 0.0233 | 0.0556* |
| | (-2.53) | (2.86) | (0.73) | (1.71) |
| Fund management fee | 0.0009 | 0.0001 | 0.0001*** | 0.0000 |
| | (1.39) | (0.49) | (3.76) | (1.03) |
| Firm TNA | 0.0003 | 0.0013*** | -0.0000 | 0.0006*** |
| | (0.71) | (2.66) | (-0.38) | (2.72) |
| # of funds in the firm | 0.0000** | 0.0000** | 0.0000 | 0.0000*** |
| | (2.55) | (2.22) | (0.40) | (3.37) |
| Extra TNA managed by mgr | -0.0001 | -0.0001 | 0.0000 | 0.0000 |
| | (-0.38) | (-0.48) | (0.34) | (-0.24) |
| | | | | |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 129534 | 150680 | 109720 | 145958 |
| R-sq | 0.079 | 0.039 | 0.240 | 0.172 |

Table 9: Performance deterioration and investment styles

This table examines when a firm's subcontractor is involved in misconduct, whether the effect on the performance of internal funds varies across different investment styles. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable is monthly return in column (1) and is monthly alpha in column (2). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. *Same style* is an indicator variable that is equal to one if the internal fund is in the same style as the outsourced funds managed by the misconduct-subcontractor, and zero otherwise. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | Monthly alpha |
|---|----------------|---------------|
| | (1) | (2) |
| Treated internal funds * Post subcontractor-misconduct | -0.0010** | -0.0002** |
| | (-1.97) | (-2.05) |
| Same style * Post subcontractor-misconduct | 0.0004* | 0.0002 |
| | (1.77) | (1.29) |
| Treated internal funds * Post subcontractor-misconduct * Same style | -0.0018*** | -0.0005*** |
| | (-5.07) | (-3.41) |
| Fund TNA | -0.0024*** | -0.0014*** |
| | (-19.60) | (-30.78) |
| Fund return | -0.0112*** | -0.0011** |
| | (-9.20) | (-2.07) |
| Fund flow | 0.0001* | 0.0000 |
| | (1.94) | (0.69) |
| Fund expense ratio | 0.0649 | 0.0093 |
| | (0.96) | (0.45) |
| Fund management fee | 0.0001 | 0.0001*** |
| | (1.38) | (5.93) |
| Firm TNA | 0.0009*** | 0.0000 |
| | (3.02) | (0.11) |
| # of funds in the firm | 0.0000*** | 0.0000*** |
| | (4.47) | (3.32) |
| Time FE | Yes | Yes |
| Fund FE | Yes | Yes |
| Ν | 340214 | 300788 |
| <u>R-sq</u> | 0.051 | 0.164 |

Table 10: Performance deterioration and reliance on subcontracting

This table examines when a firm's subcontractor is involved in misconduct, whether the effect on the performance of internal funds varies with the firm's level of reliance on subcontracting. The sample only includes internal funds in asset management firms that have subcontractors. Asset management firms are divided into two groups based on their reliance on external subcontracting in the previous year, which is measured by the percentage of TNA managed by external subcontractors. The dependent variable is monthly return in columns (1) and (2) and is monthly alpha in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | | Monthl | y alpha |
|--|----------------|------------|------------|------------|
| Group based on the firm's reliance on subcontracting | Low | High | Low | High |
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0010** | -0.0022*** | -0.0002* | -0.0009*** |
| | (-1.97) | (-3.61) | (-1.75) | (-4.49) |
| Fund TNA | -0.0132*** | -0.0114*** | -0.0028*** | -0.0001 |
| | (-9.91) | (-5.54) | (-6.69) | (-0.10) |
| Fund return | -0.0025*** | -0.0022*** | -0.0017*** | -0.0012*** |
| | (-13.69) | (-11.89) | (-27.39) | (-16.36) |
| Fund flow | -0.0000 | 0.0002*** | -0.0000** | 0.0000 |
| | (-0.72) | (3.31) | (-2.06) | (0.32) |
| Fund expense ratio | 0.0926 | 0.1293 | -0.0993*** | 0.0190 |
| | (0.96) | (1.27) | (-3.46) | (0.60) |
| Fund management fee | 0.0002 | 0.0001 | 0.0007*** | 0.0000*** |
| | (0.24) | (0.96) | (4.50) | (3.11) |
| Firm TNA | 0.0010** | 0.0015*** | -0.0002* | -0.0001 |
| | (2.27) | (3.66) | (-1.73) | (-0.50) |
| # of funds in the firm | 0.0000*** | -0.0000 | -0.0000 | 0.0000*** |
| | (5.37) | (-1.38) | (-0.83) | (3.94) |
| Extra TNA managed by mgr | -0.0001 | 0.0000 | 0.0000 | 0.0000 |
| | (-0.65) | (0.12) | (-0.31) | (-0.45) |
| | | | | |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| N | 170456 | 169758 | 150461 | 150327 |
| <u>R-sq</u> | 0.063 | 0.046 | 0.189 | 0.178 |

Table 11: Advisory compensation in treated internal funds

This table examines when a firm's subcontractor is involved in misconduct, whether the firm adjusts the advisory compensation in internal funds of the firm. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable is the weighted rate in columns (1) and (2) and is the marginal rate in columns (3) and (4), where the advisory compensation data of each fund is extracted from its N-SAR forms. *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after (or before if x is negative) the misconduct, and zero otherwise. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Weighted rate (%) | | Marginal rate (%) | |
|---|-------------------|------------|-------------------|------------|
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | 0.0052*** | | 0.0063*** | |
| | (2.66) | | (2.81) | |
| Treated internal funds * Subcontractor-misconduct (t-3) | | 0.0014 | | 0.0023 |
| | | (0.52) | | (1.01) |
| Treated internal funds * Subcontractor-misconduct (t-2) | | 0.0011 | | -0.0027 |
| | | (0.58) | | (-1.27) |
| Treated internal funds * Subcontractor-misconduct (t-1) | | -0.0024 | | 0.0013 |
| | | (-1.47) | | (0.62) |
| Treated internal funds * Subcontractor-misconduct (t+1) | | 0.0014 | | 0.0024 |
| | | (0.80) | | (1.00) |
| Treated internal funds * Subcontractor-misconduct (t+2) | | 0.0035** | | 0.0057** |
| | | (2.17) | | (1.98) |
| Treated internal funds * Subcontractor-misconduct (t+3) | | 0.0065*** | | 0.0074*** |
| | | (3.28) | | (2.96) |
| Fund TNA | -0.0008 | -0.0029*** | -0.0047*** | -0.0047*** |
| | (-1.02) | (-4.08) | (-5.35) | (-4.67) |
| Fund return | -0.0083*** | -0.0087*** | -0.0030 | -0.0019 |
| | (-2.80) | (-2.90) | (-1.20) | (-0.70) |
| Fund flow | 0.0005*** | 0.0004** | 0.0004** | 0.0006*** |
| | (3.11) | (2.44) | (1.96) | (2.62) |
| Firm TNA | -0.0009 | -0.0011 | -0.0055*** | -0.0072*** |
| | (-0.53) | (-0.70) | (-2.74) | (-3.22) |
| # of funds in the firm | -0.0002*** | -0.0001** | -0.0001 | -0.0001** |
| | (-4.97) | (-2.45) | (-1.34) | (-2.14) |
| | | | | |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| N | 22980 | 22980 | 22980 | 22980 |
| R-sq | 0.969 | 0.975 | 0.979 | 0.981 |

Table 12: Performance deterioration and advisory compensation increase

This table examines when a firm's subcontractor is involved in misconduct, whether the effect on the performance of internal funds varies with the advisory compensation level. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable is monthly return in column (1) and is monthly alpha in column (2). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. *Compensation increase* is an indicator variable that is equal to one if the asset management firm increases the pay-for-performance of the fund after the misconduct event, and zero otherwise. Fund fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | Monthly alpha |
|--|----------------|---------------|
| | (1) | (2) |
| Treated internal funds * Post subcontractor-misconduct | -0.0023*** | -0.0005*** |
| | (-5.64) | (-3.01) |
| Compensation increase * Post subcontractor-misconduct | .0005 | 0.0001 |
| | (1.22) | (1.38) |
| Treated internal funds * Post subcontractor-misconduct * Compensation increase | 0.0010*** | 0.0003*** |
| | (2.79) | (3.15) |
| Fund TNA | -0.0023*** | -0.0014*** |
| | (-19.06) | (-30.90) |
| Fund return | -0.0114*** | -0.0010** |
| | (-9.36) | (-1.99) |
| Fund flow | 0.0001* | 0.0000 |
| | (1.94) | (0.63) |
| Fund expense ratio | 0.0913 | 0.0025 |
| | (1.33) | (0.12) |
| Fund management fee | 0.0001 | 0.0001*** |
| | (0.85) | (5.56) |
| Firm TNA | 0.0009*** | 0.0000 |
| | (2.74) | (0.05) |
| # of funds in the firm | 0.0000*** | 0.0000*** |
| | (4.62) | (3.62) |
| Time FE | Yes | Yes |
| Fund FE | Yes | Yes |
| Ν | 340214 | 300788 |
| <u>R-sq</u> | 0.050 | 0.163 |

Table 13: New recruitment by affected firms

This table examines whether the firm adjusts its new recruitment when its subcontractor is involved in misconduct. The sample includes all asset management firms that have subcontractors. The dependent variable is the logged number of newly recruited fund managers by the firm. *Affected* is an indicator variable that is equal to one if the firm's subcontractor is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to are if the time window falls within three years after the subcontractor-misconduct event and is equal to zero if the time window falls within three years before the subcontractor-misconduct event. *Subcontractor-misconduct* (t + x) is an indicator variable that is equal to one if it is *x*-years after (or before if *x* is negative) the misconduct, and zero otherwise. Firm fixed effects and time fixed effects are included, together with other firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | New recruitment | | |
|---|-----------------|-----------|--|
| | (1) | (2) | |
| Affected firm * Post subcontractor-misconduct | 0.0938 | | |
| | (1.39) | | |
| Affected firm * Post subcontractor-misconduct (t-3) | | 0.0033 | |
| | | (0.05) | |
| Affected firm * Post subcontractor-misconduct (t-2) | | -0.0727 | |
| | | (-1.15) | |
| Affected firm * Post subcontractor-misconduct (t-1) | | -0.0502 | |
| | | (-0.79) | |
| Affected firm * Post subcontractor-misconduct (t+1) | | 0.0477 | |
| | | (0.75) | |
| Affected firm * Post subcontractor-misconduct (t+2) | | 0.1210* | |
| | | (1.93) | |
| Affected firm * Post subcontractor-misconduct (t+3) | | 0.1523** | |
| | | (2.42) | |
| Firm TNA | 0.0351*** | 0.0334*** | |
| | (3.28) | (3.13) | |
| # of funds in the firm | 0.0045*** | 0.0046*** | |
| | (5.90) | (6.04) | |
| The firmr's average return | 0.0245 | 0.0196 | |
| | (0.37) | (0.29) | |
| The firmr's average management fee | 0.0000 | 0.0000 | |
| | (0.10) | (0.09) | |
| The firm's average flow | 0.0001 | 0.0001 | |
| | (1.29) | (1.33) | |
| | | | |
| Time FE | Yes | Yes | |
| Firm FE | Yes | Yes | |
| Ν | 2692 | 2692 | |
| R-sq | 0.678 | 0.679 | |

Table 14: Past records of new recruits

This table examines how the firm adjusts its recruitment standards when its subcontractor is involved in misconduct. The sample includes all asset management firms that have subcontractors. The dependent variable is the average length of industry experience that newly recruited fund managers have (column 1), the average annual raw return delivered by newly recruited fund managers (column 2), and the average annual alpha delivered by newly recruited fund managers in column (3). *Affected* is an indicator variable that is equal to one if the firm's subcontractor is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the subcontractor-misconduct event and is equal to zero if the time window falls within three years before the subcontractor-misconduct event. Firm fixed effects and time fixed effects are included, together with other firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Industry | Past performance | | |
|---|------------|------------------|-----------|--|
| | (1) | (2) | (3) | |
| Affected firm * Post subcontractor-misconduct | 0.2761** | 0.0155* | 0.0068* | |
| | (2.21) | (1.83) | (1.95) | |
| Firm TNA | 0.1873** | -0.0014 | -0.0074** | |
| | (2.46) | (-0.25) | (-2.21) | |
| # of funds in the firm | -0.0053*** | 0.0000 | -0.0000 | |
| | (-3.43) | (0.09) | (-0.16) | |
| The firmr's average return | -0.8128 | -0.1623* | 0.0415 | |
| | (-1.01) | (-1.87) | (0.58) | |
| The firmr's average management fee | 0.0061 | 0.0034*** | 0.0021*** | |
| | (1.55) | (4.95) | (2.59) | |
| The firm's average flow | 0.0001 | -0.0001*** | -0.0001 | |
| | (1.51) | (-4.24) | (-1.12) | |
| Time FE | Yes | Yes | Yes | |
| Firm FE | Yes | Yes | Yes | |
| Ν | 2692 | 2692 | 2692 | |
| R-sq | 0.678 | 0.544 | 0.142 | |

Table 15: Indirect style-level subcontracting shocks

This table examines when an asset management firm experiences an indirect subcontracting shock, whether investment behavior and performance in internal funds of the firm are affected. When a subcontractor that manages outsourced funds in a certain investment style gets involved in misconduct, asset management firms that have subcontracting in the affected investment style are indirectly affected. The sample excludes funds in asset management firms, which directly have subcontracting relationships with subcontractors that are involved in the misconduct. In column 1, the dependent variable is *sector deviation*, which measures the degree in which the fund's portfolio composition in terms of industry sectors deviates from its peers with the same investment objectives each year. The dependent variable is monthly return in column (2) and is monthly alpha in column (3). *Treated* is an indicator variable that is equal to one if the asset management firm that the internal fund belongs to is indirectly affected by the subcontracting shock. *Post* is an indicator variable that is equal to one if the time window falls within three years after the indirect subcontracting shock and is equal to zero if the time window falls within three years before the shock. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Sector deviation | Monthly return | Monthly alpha | |
|---|------------------|----------------|---------------|--|
| | (1) | (2) | (3) | |
| Treated internal funds * Post indirect subcontracting shock | -0.0126* | -0.0009** | -0.0002** | |
| | (-1.92) | (-2.21) | (-1.98) | |
| Fund TNA | -0.0005 | -0.0024*** | -0.0015*** | |
| | (-0.22) | (-16.55) | (-24.78) | |
| Fund return | 0.0137 | -0.0133*** | -0.0031*** | |
| | (1.00) | (-10.07) | (-4.38) | |
| Fund flow | -0.0009 | 0.0001** | 0.0000 | |
| | (-1.45) | (2.28) | (0.39) | |
| Fund expense ratio | 0.8320 | 0.1285 | 0.0730** | |
| | (0.52) | (1.63) | (2.47) | |
| Fund management fee | -0.0025 | 0.0001 | 0.0001*** | |
| | (-0.29) | (1.28) | (3.92) | |
| # of funds in the firm | -0.0003*** | -0.0000 | 0.0000** | |
| | (-3.20) | (-0.04) | (2.47) | |
| Firm TNA | 0.0004 | 0.0016*** | 0.0001 | |
| | (0.07) | (4.30) | (1.10) | |
| Time FE | Yes | Yes | Yes | |
| Fund FE | Yes | Yes | Yes | |
| Ν | 23346 | 292978 | 218919 | |
| <u>R-sq</u> | 0.770 | 0.057 | 0.251 | |

Table 16: Policies of investment practices

This table examines when a firm's subcontractor is involved in misconduct, whether the firm adjusts the permission of investment practices in internal funds of the firm. The sample only includes internal funds in asset management firms that have subcontractors. The data of each fund's investment practices is extracted from its N-SAR forms. The dependent variable is the permission and usage of leverage in columns (1) and (2) and is the permission and usage of derivatives in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Using l | everage | Using derivatives | |
|--|------------|------------|-------------------|------------|
| | Permitted | Engaged in | Permitted | Engaged in |
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | 0.0013 | 0.0033 | -0.0029 | 0.0020 |
| | (0.30) | (1.48) | (-0.71) | (1.15) |
| Fund TNA | 0.0002 | 0.0019* | 0.0001 | 0.0048*** |
| | (0.09) | (1.81) | (0.08) | (5.88) |
| Fund return | -0.0221** | -0.0172*** | -0.0220*** | -0.0091*** |
| | (-2.33) | (-3.06) | (-2.81) | (-2.74) |
| Fund flow | 0.0005 | -0.0004 | 0.0007 | -0.0001 |
| | (1.39) | (-1.18) | (1.56) | (-0.35) |
| Fund expense ratio | -4.1297*** | 1.7661*** | -1.6380 | 0.9025** |
| | (-3.30) | (2.88) | (-1.42) | (2.37) |
| Fund management fee | -0.0016** | 0.0005 | -0.0003 | 0.0008** |
| | (-2.41) | (1.26) | (-0.68) | (2.02) |
| Firm TNA | 0.0306*** | -0.0065** | 0.0276*** | 0.0008 |
| | (6.33) | (-2.47) | (4.65) | (0.48) |
| # of funds in the firm | -0.0003*** | 0.0001*** | 0.0003*** | -0.0001*** |
| | (-6.61) | (3.25) | (5.59) | (-4.84) |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 22980 | 22980 | 22980 | 22980 |
| R-sq | 0.834 | 0.667 | 0.910 | 0.779 |

Table 17: Sub-sample with survived funds only

This table examines when a firm's subcontractor is involved in misconduct, whether performance in internal funds of the firm is affected. The sample only includes internal funds in asset management firms that have subcontractors, and I only keep a fund-year observation in my sample if the fund would not be terminated in the following three years. The dependent variable is monthly return in column (1) and is monthly alpha in column (2). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | Monthly alpha | |
|--|----------------|---------------|--|
| | (1) | (2) | |
| Treated internal funds * Post subcontractor-misconduct | -0.0018*** | -0.0004*** | |
| | (-6.21) | (-2.87) | |
| Fund TNA | -0.0023*** | -0.0014*** | |
| | (-19.42) | (-30.22) | |
| Fund return | -0.0110*** | -0.0011** | |
| | (-8.38) | (-2.08) | |
| Fund flow | 0.0000 | 0.0000 | |
| | (1.31) | (0.31) | |
| Fund expense ratio | 0.0091 | 0.0096 | |
| | (0.13) | (0.45) | |
| Fund management fee | -0.0000 | 0.0001*** | |
| | (-0.02) | (6.24) | |
| Firm TNA | 0.0007*** | 0.0000 | |
| | (2.85) | (0.26) | |
| # of funds in the firm | 0.0000*** | 0.0000*** | |
| | (4.49) | (3.52) | |
| Time FE | Yes | Yes | |
| Fund FE | Yes | Yes | |
| N | 292029 | 271614 | |
| R-sq | 0.059 | 0.169 | |

Table 18: Value added of treated internal funds

This table examines when a firm's subcontractor is involved in misconduct, whether value added of internal funds of the firm is affected. The sample only includes internal funds in asset management firms that have subcontractors. The dependent variable is the fund's value added, measured as the fund's return in excess of the benchmark times the fund size in \$ millions/month, following Berk, Van Binsbergen and Liu (2017). Treated is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund belongs to is involved regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years after the misconduct event. Fund fixed effects are reported in parentheses. ***, ***, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Value added per month | | | |
|--|-----------------------|------------|------------|--|
| | (1) | (2) | (3) | |
| Treated internal funds * Post subcontractor-misconduct | -0.0537*** | -0.0632*** | -0.0677*** | |
| | (-3.84) | (-4.30) | (-4.61) | |
| Fund TNA | | 0.0194*** | 0.0178*** | |
| | | (3.10) | (2.86) | |
| Fund return | | 0.1627*** | 0.1595*** | |
| | | (5.47) | (5.37) | |
| Fund flow | | 0.0005 | 0.0005 | |
| | | (0.35) | (0.31) | |
| Fund management fee | | 0.0228*** | 0.0225*** | |
| | | (4.21) | (4.17) | |
| Firm TNA | | | 0.0006*** | |
| | | | (7.27) | |
| # of funds in the firm | | | -0.0016*** | |
| | | | (-5.69) | |
| Time FE | Yes | Yes | Yes | |
| Fund FE | Yes | Yes | Yes | |
| Ν | 340214 | 340214 | 340214 | |
| R-sq | 0.604 | 0.614 | 0.615 | |

Table 19: Performance deterioration (sub-sample starting from 2009)

This table examines whether performance in internal funds of the firm is affected when its subcontractor is involved in misconduct. This analysis is conducted with the sub-sample starting from 2009. The dependent variable is monthly return in columns (1) and (2) and is monthly alpha in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the misconduct event and is equal to zero if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects and time fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | | Monthly alpha | |
|--|----------------|------------|---------------|------------|
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0019*** | -0.0024*** | -0.0007*** | -0.0009*** |
| | (-3.02) | (-3.22) | (-3.28) | (-4.07) |
| Fund TNA | | -0.0023*** | | -0.0016*** |
| | | (-10.72) | | (-19.91) |
| Fund return | | -0.0191*** | | -0.0061*** |
| | | (-11.74) | | (-8.14) |
| Fund flow | | 0.0001 | | 0.0000 |
| | | (0.85) | | (0.41) |
| Fund expense ratio | | 0.6086*** | | -0.0494 |
| | | (4.95) | | (-1.32) |
| Fund management fee | | 0.0001 | | 0.0001*** |
| | | (1.45) | | (4.76) |
| Firm TNA | | 0.0024*** | | 0.0003 |
| | | (4.11) | | (1.52) |
| # of funds in the firm | | 0.0000* | | 0.0000*** |
| | | (1.84) | | (3.04) |
| Extra TNA managed by mgr | | -0.0001 | | -0.0000 |
| | | (-0.31) | | (-1.21) |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 198,258 | 198,258 | 181,523 | 181,523 |
| <u>R-sq</u> | 0.049 | 0.050 | 0.158 | 0.175 |

Table 20: Performance deterioration (solo-managed vs co-managed)

This table examines when a firm's subcontractor is involved in misconduct, whether the effect on the performance of internal funds varies across different investment styles. The sample only includes internal funds in asset management firms that have subcontractors. Funds are divided into two groups, one group with internal funds that are managed by a single fund manager, and the other group with internal funds co-managed by multiple fund managers. The dependent variable is the monthly return in columns (1) and (2) and is the monthly alpha in columns (3) and (4). *Treated* is an indicator variable that is equal to one if the subcontractor of the asset management firm that the internal fund belongs to is involved in regulatory misconduct, and zero otherwise. *Post* is an indicator variable that is equal to one if the time window falls within three years after the misconduct event and is equal to zero if the time window falls within three years before the misconduct event. Fund fixed effects are included, together with fund and firm level controls. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

| Dependent Variable: | Monthly return | | Monthly alpha | |
|--|----------------|------------|---------------|------------|
| | Solo-managed | Co-managed | Solo-managed | Co-managed |
| | (1) | (2) | (3) | (4) |
| Treated internal funds * Post subcontractor-misconduct | -0.0018*** | -0.0024*** | -0.0003** | -0.0006*** |
| | (-3.87) | (-3.54) | (-2.28) | (-2.80) |
| Fund TNA | -0.0036*** | -0.0020*** | -0.0018*** | -0.0013*** |
| | (-11.90) | (-11.23) | (-17.09) | (-23.41) |
| Fund return | -0.0108*** | -0.0144*** | 0.0065*** | -0.0057*** |
| | (-5.92) | (-9.37) | (6.22) | (-12.40) |
| Fund flow | -0.0002** | 0.0002*** | -0.0000 | 0.0000 |
| | (-2.17) | (3.86) | (-0.71) | (0.18) |
| Fund expense ratio | -0.3587*** | 0.3894*** | 0.1055** | -0.0333 |
| | (-2.61) | (4.29) | (2.25) | (-1.35) |
| Fund management fee | 0.0008 | 0.0001 | 0.0011*** | 0.0000*** |
| | (0.90) | (0.45) | (4.45) | (2.97) |
| Firm TNA | 0.0009* | 0.0015*** | 0.0000 | 0.0003* |
| | (1.86) | (3.16) | (0.15) | (1.89) |
| # of funds in the firm | 0.0000*** | 0.0000 | -0.0000 | 0.0000*** |
| | (3.34) | (1.06) | (-1.13) | (3.95) |
| Extra TNA managed by mgr | -0.0004** | 0.0000 | -0.0000*** | 0.0000 |
| | (-2.03) | (0.09) | (-2.94) | (1.49) |
| Time FE | Yes | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes | Yes |
| Ν | 105318 | 202804 | 92859 | 188578 |
| R-sq | 0.074 | 0.046 | 0.270 | 0.170 |