Institutional Investment Horizons and Labor Investment Efficiency

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Abstract

We investigate how the investment horizon of a firm's institutional shareholders affects the efficiency of its labor investments. We argue that long-term investors have greater incentives to engage in effective monitoring, which reduces agency conflicts in labor investment choices. Consistent with this argument, we find that abnormal net hiring, measured as the absolute deviation from net hiring predicted by economic fundamentals, decreases in the presence of institutional investors with longer investment horizons. Firms dominated by long-term shareholders reduce both over-investment (over-hiring and under-firing) and under-investment in labor (under-hiring). The monitoring role of long-term investors is more pronounced for firms facing higher labor adjustment costs. These results are robust to alternative model specifications and variable definitions, as well as to tests controlling for the endogeneity in the institutional shareholders' investment decisions. Overall, our findings suggest that institutional investors play an important role in firm-level employment decisions.

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1. Introduction

In a frictionless world with no agency conflicts, managers will always seek to maximize shareholder wealth by choosing optimal levels of investment. Agency theory, however, predicts that the potential divergence in interests between shareholders and managers can influence firms' investment policies, leading to inefficiencies in the form of over- and under-investment (Jensen and Meckling, 1976; Jensen, 1986; Stein, 1989; Shleifer and Vishny, 1989; Stulz, 1990).[1] Recent evidence suggests that the presence of long-term investors, who typically have strong monitoring incentives, can help mitigate these inefficiencies and reduce the agency conflicts associated with investments in capital (Cella, 2014), research and development (Bushee, 1998; Aghion, Van Reenen and Zingales, 2013), acquisitions (Gaspar, Massa, and Matos, 2005; Chen, Harford, and Li, 2007), and corporate social responsibility (Neubaum and Zahra, 2006; Kecskés, Mansi, and Nguyen, 2014). In this paper, we extend this line of research by investigating the impact of investor horizons on another important investment decision that has so far been overlooked, namely investments in labor.

An important factor that should affect the willingness of an institutional investor to engage in monitoring is the time horizon of their investment. Institutional shareholders can vary in their investment horizons because of differences in their trading strategies and/or the maturities of their liabilities. Many hedge funds and mutual funds, for example, are short term as a result of their trading strategies and their high liquidity needs, whereas pension funds and insurance companies usually have long horizons because of the longer maturities of their liabilities (Cella, 2014; Kecskés, Mansi, and Nguyen, 2014). Similarly to Gaspar, Massa, and Matos (2005) and Chen, Harford, and Li (2007), we argue that long-term investors benefit from

[1] Hubbard (1998) and Stein (2003) provide a comprehensive review of the literature.

economies of scale in collecting and processing corporate information. In addition, investors with a longer horizon have more incentives to spend resources on monitoring, as they are more likely to remain shareholders of the firm long enough to reap the associated benefits. Most importantly, they have stronger motives to influence firms' labor investment policies and to ensure that managers are less likely to deviate from the optimal level of investment in labor because optimal employment choices may not bring short-term benefits but should be reflected in stock prices over the long term.

We are particularly interested in studying the influence of investor horizons on labor investments for the following reasons. First, the importance of labor as a production input has increased dramatically in recent years. Today's firms are more human-capital-intensive and operate in an environment where labor plays an increasingly significant role in determining firms' competitive success, particularly in areas like innovation and product development (Pfeffer, 1996; Zingales, 2000). Second, labor investments are economically significant. As noted by Jung, Lee, and Weber (2014), the payroll and employee benefits in the U.S. manufacturing sector totaled $784 billion in 2008 compared to the $166 billion in capital expenditure. Third, and most importantly, labor investments provide a good setting for examining the role of long-term investors in mitigating agency conflicts because, as we detail next, employment decisions have the potential for large disparities between shareholder and manager interests.

Inefficiencies in human-capital investments can take the form of over- and/or under-investment in labor. Over-investment in labor could take place if agency conflicts were to lead self-interested managers to engage in over-hiring activities as part of their empire-building agendas. Williamson (1963) specifically uses the expansion of staff numbers beyond optimal

levels as an example of managers' opportunistic behavior aimed at gaining more security, power, status and prestige, and greater professional achievement. Over-investment in labor could also occur if managers decided to retain (under-fire) poorly performing employees as a mutually beneficial arrangement. Bertrand and Mullainathan (2003) show that managers may be reluctant to trim an unproductive workforce because of their preference for the quiet life and their desire to avoid the difficult decisions and costly effort associated with downsizing. Pagano and Volpin (2005) demonstrate that top managers facing potential dismissal for poor performance may form an alliance with labor by abstaining from worker layoffs and wage cuts. Workers, in return, may help retain such managers if they have sufficient power to affect such decisions. According to the predictions of the Pagano and Volpin model, managers may even transform employees into a "shark repellent" through the use of long-term labor contracts, thereby reducing the firm's attractiveness as a potential target for outside investors. Landier, Nair, and Wulf (2009) find that firms in the U.S. are less likely to lay off workers located geographically closer to the corporate headquarters, and that this behavior may in part reflect private benefits to CEOs that come from interacting with workers and communities close to the corporate headquarters. Atanassov and Kim (2009) provide evidence that weak investor protection combined with strong union laws lead to worker-management alliances, in which poorly performing firms sell assets to prevent large-scale layoffs, garnering worker support for the retaining of the management.

Under-investment in labor, on the other hand, could occur if pressure from outside investors were to lead managers to over-fire underperforming employees or to under-hire in order to meet earnings targets. As stressed by Narayanan (1985), Stein (1989), Porter (1992), Froot, Perold, and Stein (1992), and Von Thadden (1995), among others, myopic pressures from outside investors can result in managers turning down valuable investment opportunities due to

concerns over the firm's short-term stock price. The benefits of intangible investments such as labor, research and development, advertising, and social capital are only visible in the long run. Therefore, a manager concerned with short-term results can end up under-investing in labor in fear that such investments would depress earnings and adversely affect stock prices (Porter, 1992; Bushee, 1998). Indeed, empirical evidence produced by Graham, Harvey, and Rajgopal (2005) shows that a significant number of managers are willing to give up projects that will be profitable in the long run in order to meet short-run earnings targets. Of most relevance to our context is the finding that firms can postpone or eliminate hiring in order to avoid missing earnings targets.

In light of the abundant evidence in previous studies on the agency conflicts associated with labor investments, an important question we try to answer in this paper is whether the existence of long-term institutional investors in a firm's ownership structure can help mitigate these conflicts. We hypothesize that, in firms with longer investor horizons, direct monitoring by long-term investors coupled with the lack of myopic pressure from short-term investors should result in fewer sub-optimal labor investments.

To capture the investment horizon of a firm's shareholders, we follow Gaspar, Massa, and Matos (2005) and Gaspar, Massa, Matos, Patgiri, and Rehman (2013) and measure the investment horizon of each institutional shareholder using his/her portfolio turnover level. We then aggregate individual turnover rates within each firm to get the (weighted) average portfolio turnover rate of all institutional investors with positive shareholdings in the firm. To ensure that higher values of our horizon proxy correspond to a longer investment horizon and to simplify the interpretation of our results, we multiply the investor turnover measure by -1. We use this proxy,

which we call *Investor_Stability*, to study how the investment horizon of a firm's institutional shareholders affects the efficiency of its labor investments.

As in Pinnuck and Lillis (2007), Benmelech, Bergman, and Seru (2012), and Jung, Lee, and Weber (2014), we use firms' net hiring, that is, the percentage change in the number of employees, to proxy for investment in labor. Investment inefficiencies are then measured as the absolute deviation of actual net hiring from its expected (optimal) level, predicted by economic fundamentals. For our main analysis, we rely on the labor demand model of Pinnuck and Lillis (2007) to estimate a firm's expected level of net hiring. The model uses an extensive list of economic variables to explain normal hiring practices. Therefore, our measure of abnormal net hiring captures the amount of net hiring not attributable to these underlying economic factors. In robustness tests, we estimate expected net hiring using the firm's average investment in the previous three years (Titman, Wei, and Xie, 2004; Cella, 2014), the median investment in the firm's industry (Harvey, Lins, and Roper, 2004; Cella, 2014; Jung, Lee, and Weber, 2014), and also consider several modifications to the Pinnuck and Lillis (2007) model.

To test our predictions, we use a sample of 41,819 firm-year observations from 1983 to 2010. We find strong evidence that the presence of institutional investors with longer investment horizons is associated with significantly lower inefficiencies in labor investments. In particular, the impact of investor portfolio stability on abnormal net hiring is economically significant: a one standard deviation increase in *Investor_Stability* (0.056), which corresponds to an increase in investment horizon of 6.3 months, is associated with a reduction in abnormal net hiring of 11.3% relative to the median. This result holds across a variety of model specifications, different measures of expected net hiring, and is robust to controlling for known factors that might affect the efficiency of employment decisions. Our result is also robust to the inclusion of standard

corporate governance measures, as well as proxies for managerial ownership, blockholding, and managerial ability.

Next, we provide evidence on the interaction between institutional investment horizons and different types of inefficiencies in labor investments. Specifically, we investigate over-investment (over-hiring and under-firing) and under-investment (under-hiring and over-firing) problems and find that, except for over-firing, each particular form of inefficiency is mitigated by the presence of long-term investors. Moreover, we show that the impact of *Investor_Stability* on abnormal net hiring is more pronounced for firms that face higher labor adjustment costs, as proxied by their dependence on skilled labor (Ochoa, 2013; Belo and Lin, 2013). This finding is consistent with the notion that long-term investors play a stronger monitoring role when a deviation from the optimal labor demand policy is more costly to the firm.

A major concern with a causal interpretation of our findings is self-selection. The coefficient on *Investor_Stability* may be biased if long-term investors select firms that are more efficient in their labor investments. We address this endogeneity concern in a number of ways. First, following Derrien, Kecskés, and Thesmar (2013) and Kecskés, Mansi, and Nguyen (2014), we split long-term investors into non-indexers and indexers using Bushee's (1998) measures. We show that our results are similar for both potentially endogenous non-indexers and reasonably exogenous indexers. The latter are passive investors that are widely diversified and do not trade much; that is, they cannot freely discard firms' stocks as they must replicate an index. For this reason, they are more likely to influence the firms in which they invest through voice. As Derrien, Kecskés, and Thesmar (2013) describe, indexers cannot be active investors but have an incentive to be activist investors. The fact that our results hold for long-term indexers mitigates the concern that long-term investors choose firms with more efficient labor investments.

Second, we adopt an instrumental variable approach in which we use implied mutual fund flows (Edmans, Goldstein, and Jiang, 2012) and stock liquidity as instruments for *Investor_Stability*. When a mutual fund experiences large outflows it is forced to liquidate a portion of its holdings to repay its investors. This will affect a firm's *Investor_Stability* but not for reasons associated with firm characteristics such as labor investment. We also expect *Investor_Stability* to be lower for more liquid firms because shareholders of these firms face lower transaction costs and a smaller price impact of winding down their positions if dissatisfied with the firm. However, we cannot see any reason why stock liquidity should be directly related to labor investment efficiency. Our results remain unchanged after controlling for endogeneity using this instrumental variable approach.

The main contribution of our study is that we provide novel evidence on the role of institutional investors in mitigating labor investment problems. Notably, the finding that institutional investment horizons are associated with more efficient employment decisions is new in the extant literature. As mentioned earlier, this result extends the recent literature that examines the impact of institutional shareholder horizons on corporate investment policies (Bushee, 1998; Neubaum and Zahra, 2006; Gaspar, Massa, and Matos, 2005; Chen, Harford, and Li, 2007; Aghion, Van Reenen and Zingales, 2013; Derrien, Kecskés, and Thesmar, 2013; Cella, 2014; Kecskés, Mansi, and Nguyen, 2014) by showing their effect on another important investment decision, that is, labor investments.

We also contribute to a broader line of research that investigates the impact of investor horizons on various corporate financial variables, relationships, and policies, including the cost of debt (Elyasiani, Jia, and Mao, 2010), the potential for financial misreporting (Burns, Kedia, and Lipson, 2010), CEO turnover-performance sensitivity (Gao, Harford, and Li, 2014), the

tradeoff between dividends and share repurchases (Gaspar, Massa, Matos, Patgiri, and Rehman, 2013), the sensitivity of investment to internal cash flows (Attig, Cleary, El Ghoul, and Guedhami, 2012), the cost of equity (Attig, Cleary, El Ghoul, and Guedhami, 2013), cash holdings (Harford, Kecskés, and Mansi, 2012), and seasoned equity offerings (Hao, 2014).

Our study is also related to a number of papers examining the interaction between labor and corporate governance. Bertrand and Mullainathan (2003) provide evidence that managers may avoid downsizing because they prefer the quiet life, whereas Perry and Shivdasani (2005) demonstrate that good corporate governance, in the form of a more independent board, makes managers more likely to downsize in response to performance declines. Pagano and Volpin (2005) and Atanassov and Kim (2009) show that managers may collude with workers for mutual protection. Landier, Nair, and Wulf (2009) find that CEOs can benefit from keeping close ties with workers close to the corporate headquarters, and are therefore less likely to lay off these workers. Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos (2009) show that entrenched CEOs pay more to employees closer to them in the corporate hierarchy and to those associated with strong unions in order to enjoy smoother wage bargaining and improved social relations with employees. We show that the existence of institutional investors with longer investment horizons in a firm's ownership structure can help mitigate these conflicts.

Finally, our paper is closely related to a recent study by Jung, Lee, and Weber (2014) that also considers the implications of agency conflicts for labor investments. However, their focus is different from ours as they examine the role of financial reporting quality in mitigating inefficiencies associated with labor investments. Our results suggest that investor horizons, as an external governance mechanism, can also help to reduce these inefficiencies.

The remainder of the paper is organized as follows. Section 2 describes the data and research design. Section 3 reports and discusses the main empirical results. Section 4 presents several robustness tests and Section 5 concludes.

2. Data and Research Design

2.1 Sample and Data Sources

To empirically investigate the relationship between institutional investment horizons and labor investment efficiency, we begin with all firms in Compustat between 1983 and 2010. We then exclude firms with missing data for the main variables used in our regressions. Consistent with the extant literature, we also exclude financial firms and utilities (i.e., firms with SIC codes between 6,000 and 6,999 or 4,900 and 4,999). We obtain data on the portfolio holdings of institutional investors from the Thomson-Reuters Institutional Holdings (13F) Database, which provides institutional common stock holdings and transactions, as reported on Form 13F that is filed with the SEC. This data set contains ownership information for institutional managers with $100 million or more in assets under management. Information on firms' net hiring and financial characteristics is obtained from Compustat. Data on stock returns comes from the Center for Research in Security Prices (CRSP). To mitigate the effect of outliers, we winsorize all Compustat variables at the 1st and 99th percentiles of their distributions. The final sample consists of 41,819 firm-year observations representing 6,391 unique firms over the period 1983 to 2010.

2.2 Investment Horizon Measure

To measure the investment horizon of a firm's institutional investors we proceed as follows. Using data on the portfolio holdings of institutional investors from the Thomson-Reuters Institutional Holdings (13F) database, and following Gaspar, Massa, and Matos (2005)

and Gaspar, Massa, Matos, Patgiri, and Rehman (2013), we compute each institutional shareholder's investment horizon by looking at the quarterly turnover level of their portfolio, that is, the ratio of dollar share purchases and sales during a quarter to the total dollar value of the portfolio. The logic behind this measure is that investors will be classified as long term if they churn their overall portfolio less frequently. Derrien, Kecskés, and Thesmar (2013) demonstrate the validity of the portfolio turnover measure as a proxy for the investment horizon by showing that the measure is persistent over time, that is, that the investor horizon is a characteristic of investors, and that the measure is accurate in classifying investors known to be long term, such as Warren Buffett (Berkshire Hathaway), CalPERS, and Vanguard Group, and those known to be short term, such as György Soros (Soros Fund Management) and Stevie Cohen (SAC Capital Management). Specifically, the turnover rate of institutional investor i in quarter q is calculated as follows:

$$TR_{i,q} = \frac{\sum_{k=1}^{Q_q} \left| N_{k,i,q} P_{k,q} - N_{k,i,q-1} P_{k,q-1} - N_{k,i,q-1} \Delta P_{k,q} \right|}{\sum_{k=1}^{Q_q} \frac{N_{k,i,q} P_{k,q} + N_{k,i,q-1} P_{k,q-1}}{2}} \qquad (1)$$

where $TR_{i,q}$ is the turnover rate of investor i in quarter q, Q_q is the set of companies held by investor i in quarter q, $N_{k,i,q}$ is the number of shares of company k held by investor i in quarter q, and $P_{k,q}$ is the share price of firm k in quarter q. By construction, the range of the turnover rate is the interval [0, 2]. To provide a more stable and accurate classification of an investor's horizon, we then calculate the average turnover level of his/her portfolio over the previous four quarters as follows:

$$Avg\_TR_{i,q} = \frac{1}{4} \sum_{r=1}^{4} TR_{i,q-r+1} \qquad (2)$$

Using the investor-level turnover rate ($Avg\_TR_{i,q}$), we then calculate the firm-level turnover rate as the weighted average of the turnover rates of all institutional investors in a firm's ownership structure:

$$Inv\_Turnover_{k,q} = \sum_{i \in S_{k,q}} w_{k,i,q}\, Avg\_TR_{i,q} \qquad (3)$$

where $w_{k,i,q}$ is the weight of investor i in the total percentage held by institutional investors in company k at quarter q, and $S_{k,q}$ is the set of institutional investors in company k at quarter q. Finally, to ensure that higher values of our horizon proxy correspond to a longer investment horizon and to simplify the interpretation of our results, we multiply the investor turnover measure by -1. We use this proxy, which we call *Investor_Stability*, to study how the investment horizon of a firm's institutional shareholders affects the efficiency of its labor investments. In addition to our main proxy (*Investor_Stability*), we also compute the percentage of firm ownership held by long-term (*Long-term_IO*) and short-term (*Short-term_IO*) investors, where we define long-term (short-term) shareholders as investors in the bottom (top) 33rd percentile of the average turnover rate ($Avg\_TR_{i,q}$).

2.3 Measure of Labor Investment Efficiency

Following Pinnuck and Lillis (2007), Benmelech, Bergman, and Seru (2012), Li (2011), and Jung, Lee, and Weber (2014), we use firms' net hiring measured as the percentage change in the number of employees between year *t-1* and year *t* to proxy for investment in labor. We then measure investment inefficiencies (*Abnormal_Net_Hiring*) as the absolute deviation of actual net hiring from its expected (optimal) level predicted by economic fundamentals:

$$Abnormal\_Net\_Hiring = |Actual\_Net\_Hiring - Expected\_Net\_Hiring| \qquad (4)$$

Our main estimate of a firm's expected level of net hiring is based on the labor demand model of Pinnuck and Lillis (2007).[2] This model uses an extensive list of economic firm-specific variables to explain normal hiring practices; it has been used by several recent studies to examine deviations from optimal investments in labor (e.g., Dierynck, Landsman, and Renders, 2012; Jung, Lee, and Weber, 2014). More specifically, following Pinnuck and Lillis (2007), we use the following regression to estimate expected net hiring:

$$\begin{aligned} Net\_Hiring_{i,t} = {} & \alpha + \beta_1 Sales\_Growth_{i,t} + \beta_2 Sales\_Growth_{i,t-1} + \beta_3 Profit_{i,t} + \beta_4 \Delta Profit_{i,t} \\ & + \beta_5 \Delta Profit_{i,t-1} + \beta_6 Return_{i,t} + \beta_7 Size_{i,t-1} + \beta_8 Quick\_Ratio_{i,t-1} \\ & + \beta_9 \Delta Quick\_Ratio_{i,t-1} + \beta_{10} \Delta Quick\_Ratio_{i,t} + \beta_{11} Leverage_{i,t-1} \\ & + \sum_{L=1}^{5} \delta_L Loss\_Bins_t{}^{1to5} + \lambda_j + \varepsilon_{i,t} \end{aligned} \quad (5)$$

where *Net_Hiring* is the percentage change in the number of employees, *Sales_Growth* is the percentage change in sales revenue, *Profit* is net income scaled by beginning-of-year total assets, Δ*Profit* represents the change in net income scaled by beginning-of-year total assets, *Return* is the total annual stock return, *Size* is measured as the logarithm of the firm's book value of assets, *Quick_Ratio* is the ratio of cash and short-term investments plus receivables to current liabilities, *Leverage* is measured as long-term debt plus debt in current liabilities, scaled by the book value of assets, and *Loss_Bins* are five dummy variables indicating each interval of profitability of length 0.005 from 0 to -0.025. For example, *Loss_Bin1* takes the value of one if *Profit* is between

[2] As a robustness test, we also consider alternative proxies for expected net hiring in Section 4.1.

-0.005 and 0, and zero otherwise, and so on for the other *Loss_Bins*. The model also includes industry fixed effects (λ_j).[3]

2.4 Empirical Specification and Control Variables

To explore the interaction between institutional investment horizons and labor investment efficiency, we examine the effect of *Investor_Stability* on *Abnormal_Net_Hiring*. To do so, we follow Jung, Lee, and Weber (2014) and specify the following baseline model:

$$Abnormal\_Net\_Hiring_{i,t} = \alpha + \delta(Investor\_Stability_{i,t-1}) + \beta' X_{i,t-1} + \lambda_j + \eta_t + \varepsilon_{i,t} \quad (6)$$

where the subscripts *i* and *t* refer to firm *i* and year *t*, respectively. *Investor_Stability* and *Abnormal_Net_Hiring* are defined as in Sections 2.2 and 2.3, respectively. The vector $X_{i,t-1}$ includes control variables that, based on previous literature (e.g., Jensen, 1986; Stulz, 1990; Richardson, 2006; Biddle, Hilary, and Verdi, 2009), are likely to be associated with a firm's investment efficiency. In particular, we follow Jung, Lee, and Weber (2014) and control for investment opportunities, size, corporate liquidity, dividend payouts, cash flow and sales volatilities, tangibility, any incidence of losses, net hiring volatility, labor intensity, and institutional ownership. We also include a proxy for inefficiencies associated with non-labor investments (capital expenditure, R&D expenditure, and acquisitions) to control for any indirect effect on *Abnormal_Net_Hiring* from other investment decisions; see Appendix A for detailed variable definitions. *Investor_Stability* and all other explanatory variables are lagged by one

[3] We present the regression results for equation (5) in Table B.1 of Appendix B. Consistent with Pinnuck and Lillis (2007), we find that sales growth, profitability, stock returns, size, and corporate liquidity have a positive and significant impact on net hiring. Leverage and the loss bins, on the other hand, are negatively associated with net hiring. Most importantly, the fitted value from regression (5) is the estimate of a firm's *Expected_Net_Hiring*, while the unexplained portion (or residual) becomes our estimate of a firm's *Abnormal_Net_Hiring*.

period.[4] Finally, we account for time-invariant industry heterogeneity and time trends by including a vector of industry fixed effects and time dummies (λ_j and η_t). Standard errors are heteroskedasticity-robust and clustered at the firm level.

2.5 Summary Statistics and Univariate Tests

Table 1 reports summary statistics for the labor investment, ownership, and control variables used in our main analysis.[5] The average and median values of our dependent variable, *Abnormal_Net_Hiring*, are 0.120 and 0.070, respectively; this means that actual net hiring deviates on average from expected net hiring by 12 percentage points. These figures are in line with Jung, Lee, and Weber (2014), who report mean and median *Abnormal_Net_Hiring* values of 0.113 and 0.070, respectively. Institutional investors own, on average, 45.5% of firms' equity. There is a clear time trend, with institutional ownership increasing substantially over the last 20 years (untabulated result). The average investor turnover (*Inv_Turnover*) is 0.203, which means that institutional investors hold an average stock in their portfolio for around 29.5 months.[6] Long-term institutional investors (i.e., investors in the bottom 33rd percentile of average turnover rate) hold, on average, 9.2% of their portfolio firms' shares, as compared to the 15.5% held by

[4] As a robustness test, we also control for a number of other variables in Sections 4.3 and 4.4. Our results remain qualitatively similar.

[5] The descriptive statistics for the variables in equation (5) are similar to those reported in Pinnuck and Lillis (2007) and Jung, Lee, and Weber (2014). For example, the average expected annual percentage change in the number of employees (*Expected_Net_Hiring*) is 5.7%, which is very close to the 5.4% reported in Pinnuck and Lillis (2007) and the 5.9% reported in Jung, Lee, and Weber (2014).

[6] Recalling that *Inv_Turnover* takes values in the interval [0, 2], an average *Inv_Turnover* of 0.203 means that 0.203/2 = 10.15% of the portfolio is turned over in a given quarter. This corresponds to 40.6% of the position being turned over in a given year, which implies that institutional investors hold an average stock in their portfolio for around 12/0.406 = 29.5 months. There is a clear time trend in *Inv_Turnover*; that is, *Inv_Turnover* has increased in recent years (untabulated result).

short-term investors. The summary statistics for the control variables used in our baseline specifications are generally comparable to those reported in Jung, Lee, and Weber (2014).

Panel A of Table 2 provides information on the correlations between our dependent variable, *Abnormal_Net_Hiring*, our main variable of interest, *Investor_Stability*, and the other ownership variables. Consistent with our main hypothesis, we find that the correlation between *Investor_Stability* and *Abnormal_Net_Hiring* is negative (-0.092), suggesting that longer investment horizons are associated with more efficient levels of investment in labor. As expected, *Abnormal_Net_Hiring* is also negatively correlated with both institutional ownership (*Inst_Ownership*) and long-term ownership (*Long-term_IO*), but has a positive correlation with short-term ownership (*Short-term_IO*).

In Panel B of Table 2, we conduct a univariate analysis in which we compare *Abnormal_Net_Hiring* for firms with above- and below-median *Investor_Stability*. Column 1 reports the average and median *Abnormal_Net_Hiring* values across all firms in the sample. Columns 2 and 3 present the mean and median values for firms with above- and below-median *Investor_Stability*, respectively. Column 4 reports the difference in means (medians), along with the significance level for the *t*-test of differences in means and the Wilcoxon rank-sum test of differences in medians. Our comparison reveals that firms with above-median *Investor_Stability* display significantly lower *Abnormal_Net_Hiring* than firms with below-median *Investor_Stability*. Specifically, the average (median) value of *Abnormal_Net_Hiring* is 10.7% (6.6%) for firms with above-median *Investor_Stability*, compared to a value of 13.3% (7.7%) for firms with below-median *Investor_Stability*. The difference of 2.6 (1.1) percentage points is statistically significant at the 1% level, and is economically significant as it amounts to around 22% (9%) of the average value of *Abnormal_Net_Hiring*. This preliminary finding suggests that

more stable ownership by institutional investors is associated with fewer sub-optimal employment decisions, consistent with our main hypothesis.

3. Empirical Results

3.1 Investment Horizons and Labor Investment Efficiency: Main Findings

Table 3 presents the regression results on the relation between institutional portfolio stability and abnormal net hiring. We report p-values based on heteroskedasticity-robust standard errors, clustered at the firm level. All regressions include industry and year dummies but, to conserve space, we do not report their estimates. In Model 1, we exclude *Investor_Stability* and regress *Abnormal_Net_Hiring* on the control variables listed in Section 2.4. Firms with higher institutional ownership stakes, of a bigger size, with less liquidity, more conservative debt policies, positive dividend payouts, more tangible assets, and higher labor intensity tend to exhibit lower inefficiencies in their labor investments. At the same time, *Abnormal_Net_Hiring* is positively related to a higher incidence of losses, abnormal non-labor investments, and the volatilities of cash flow, sales, and past net hiring. These results are broadly consistent with previous evidence in the literature (e.g., Jung, Lee, and Weber, 2014).

Model 2 is identical to Model 1 except that *Investor_Stability*, our main variable of interest, is now introduced as an additional explanatory variable. In line with our main hypothesis, we find that the coefficient estimate for *Investor_Stability* is negative and highly significant, suggesting that a more stable institutional ownership structure helps improve the efficiency of a firm's labor investments. The impact of investor portfolio stability on abnormal net hiring is also economically significant: a one standard deviation increase in *Investor_Stability*

(0.056), which corresponds to an increase in the investment horizon of 6.3 months, is associated with a reduction in *Abnormal_Net_Hiring* of 11.3% relative to the median.

In Model 3, we use long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership as our main independent variables in place of *Investor_Stability*. The results show that, as expected, ownership by long-term investors has a strong negative impact on abnormal net hiring, while the holdings of short-term investors are positively associated with abnormal net hiring. This result is largely consistent with our main hypothesis that direct monitoring by long-term investors, coupled with less myopic pressure from short-term investors, should reduce sub-optimal labor investments. Interestingly, the coefficient on *Long-term_IO* (-0.069) is three times the size of the coefficient on *Short-term_IO* (0.021), which suggests that the presence of long-term investors has a more pronounced effect on labor investment efficiency than the presence of short-term investors. This finding points to the importance of the monitoring role played by institutional investors with longer investment horizons in mitigating agency conflicts. To assess the economic significance of these effects, we look into marginal effects: a one standard deviation increase in *Long-term_IO* (*Short-term_IO*) leads to a reduction (rise) in *Abnormal_Net_Hiring* of 7.1% (2.8%) relative to the median.

Overall, our findings are qualitatively similar across a variety of model specifications, that is, institutional ownership stability has a robust and negative impact on abnormal net hiring practices. This evidence is consistent with our main hypothesis that the investment horizon of a firm's institutional shareholders increases the efficiency of its labor investments.

3.2 Investment Horizons and Specific Types of Labor Investment Inefficiency

In this section, we provide evidence on the interaction between institutional investment horizons and specific forms of labor investment inefficiencies. We separately investigate whether investor portfolio stability mitigates over- and/or under-investment in labor. We define over-investing firms as those with positive abnormal net hiring (i.e., *Actual_Net_Hiring* greater than *Expected_Net_Hiring*) and under-investing firms as those with negative abnormal net hiring (i.e., *Actual_Net_Hiring* less than *Expected_Net_Hiring*).

Table 4 presents the results on the relation between investor stability and over-investment. In Model 1, we estimate equation (6) for our subsample of over-investing firms. We find that *Investor_Stability* reduces *Abnormal_Net_Hiring* for these firms. In Model 2, we substitute *Investor_Stability* with long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership. Long-term investors have a significantly negative impact on abnormal net hiring, while short-term investors have no significant effect. This is largely consistent with our hypothesis that long-term investors, through monitoring, help mitigate agency conflicts that lead self-interested managers to engage in over-investment activities.

In Models 3–6, we further decompose over-investment into over-hiring and under-firing based on whether a firm's labor force is expected to grow or diminish according to economic fundamentals. Specifically, a firm over-hires (under-fires) if it over-invests when its expected level of net hiring is positive (negative). We find that each form of over-investment is mitigated by the presence of long-term investors.

In Table 5, we report the results on the effect of investor stability on under-investment. In Model 1, we estimate equation (6) for a subsample of under-investing firms. We find that *Investor_Stability* reduces the deviation between actual and expected net hiring. In Model 2, we

substitute *Investor_Stability* with long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership. Similarly to the results for the subsample of over-investing firms, long-term investors have a strong negative impact on the abnormal net hiring of under-investing firms, while short-term investors exert no such effect. In Models 3–6, we further break down under-investment into under-hiring and over-firing. A firm under-hires (over-fires) if it under-invests when its expected level of net hiring is positive (negative). We find that only under-hiring is mitigated by the presence of long-term investors. Over-firing is not related to any of our institutional ownership variables, that is, investment horizon or ownership level variables.

In summary, we find that, except for over-firing, each particular form of labor investment inefficiency is mitigated by the presence of long-term investors. These results suggest that long-term investors are not solely associated with increases or reductions in labor investment, but actually play an important role in ensuring that firms' employment levels are generally closer to those justified by economic fundamentals. Our findings for labor are largely consistent with Cella's (2014) results on non-labor-related investments (capital expenditure, R&D, acquisitions), in which she shows that an increase in the stake held by long-term investors is associated with a subsequent decrease (increase) in real investment in firms that invest too much (too little). Finally, our result that the presence of long-term investors has a more pronounced effect than the presence of short-term investors on labor investment efficiency is also in line with Cella's (2014) finding of no association between short-term investors and real investment policies.[7]

[7] Recall that the significant result we find in Table 4 for short-term investors disappears when we investigate over- and under-investment separately.

3.3 Moderating Effect of Labor Adjustment Costs

In an attempt to better explain the investor incentives for the observed negative relation between *Investor_Stability* and *Abnormal_Net_Hiring*, we examine whether the impact of *Investor_Stability* on *Abnormal_Net_Hiring* is more pronounced for firms that face higher labor adjustment costs. Earlier studies document the presence of economically significant costs associated with firms' labor adjustments. These costs, which include the costs of firing (e.g., severance pay and lawsuits), search (e.g., recruitment agency fees and advertising), selection and hiring (e.g., application screening and interviews), training, and costs due to productivity losses (e.g., peer and supervisor disruption), tend to rise with the skill level of the human capital that a firm employs (Oi, 1962; Pfann and Palm, 1993; Mortensen and Pissarides, 1994; Hamermesh and Pfann, 1996; Dixit, 1997). Because firms cannot adjust their labor demand costlessly, they have an incentive to keep labor turnover stable and to minimize deviations from the optimal labor demand policy implied by economic fundamentals (Dixit, 1997). Therefore, we expect long-term investors to have a stronger incentive to monitor the employment activities of the firm when it faces higher labor adjustment costs because deviations from the optimal labor demand policy are more costly to the firm in this case.

We use a firm's level of dependence on skilled labor to proxy for the labor adjustment costs it faces. The argument that skilled workers are associated with higher labor adjustment costs is well backed by prior evidence in the literature (e.g., Oi 1962; Dixit 1997, Ochoa, 2013). To measure firms' reliance on skilled labor, we follow Ochoa (2013), and Belo and Lin (2013), and use Occupational Employment Statistics (OES) data from the Bureau of Labor Statistics and the U.S. Department of Labor's O*NET program classification of occupations according to skill

level, to construct an industry-specific index that proxies for the labor adjustment costs faced by the average firm in that industry.[8]

To test our predictions, we split our sample firms into skilled-labor dependent and skilled-labor independent. We define firms with above-median *Labor_Skill* scores as skilled-labor dependent and those with below-median scores as skilled-labor independent.[9] Table 6 shows how the relation between firms' *Investor_Stability* and *Abnormal_Net_Hiring* varies with their degree of reliance on skilled labor. Columns 1 and 2 report the results for the whole sample. The coefficient on *Investor_Stability* is three times the size for skill-dependent firms (-0.218) as for skill-independent firms (-0.073); the difference is statistically significant at the 1% level. Columns 3-4 and 5-6 reveal similar patterns when we examine the over- and under-investment problems separately. In sum, our findings are consistent with the hypothesis that long-term investors play a stronger monitoring role when the deviation from the optimal labor demand policy is more costly to the firm.

4. Robustness Tests

4.1 Alternative Proxies for the Expected Level of Net Hiring

A central issue in our research design is how we estimate a firm's expected (optimal) level of labor investment. Following Pinnuck and Lillis (2007), we have thus far used the fitted value of net hiring in a regression of it on firm-level fundamentals as a proxy for the optimal level of investment in labor. To examine the robustness of our results, we replicate our analysis using several alternative measures of expected net hiring. The results are reported in Table 7.

[8] The O*NET occupational classifications are based on how much education, related work experience, and training an employee would need in order to perform a given job at a competent level.

[9] Our results are qualitatively similar when we use top and bottom 30th percentile cut-off points instead.

Since the original Pinnuck and Lillis (2007) model includes only industry fixed effects, we first test for the robustness of our findings by estimating expected net hiring with industry and time fixed effects in Model 1 as well as with firm and time fixed effects in Model 2. The results are qualitatively similar to our baseline findings. In Model 3, we estimate expected net hiring using the median investment in the firm's industry (Harvey, Lins, and Roper, 2004; Cella, 2014; Jung, Lee, and Weber, 2014), defining industries using the Fama-French (1997) 48-industry classification. In Model 4, we estimate expected net hiring using the firm's average investment in the previous three years (Titman, Wei, and Xie, 2004; Cella, 2014). In both models, we find that the coefficient on *Investor_Stability* remains negative and highly significant, suggesting that our results are robust to alternative definitions of expected net hiring.

4.2 Endogeneity of Investment Horizons

A major concern with a causal interpretation of our empirical results is self-selection. If long-term investors choose to invest in firms based on the efficiency of these firms' labor investments then our coefficient estimate for *Investor_Stability* may be biased. Firms with longer investor horizons will be associated with lower values of *Abnormal_Net_Hiring*, not because the long-term investors of these firms mitigate agency conflicts through monitoring but because these investors are able to self-select into these firms. To mitigate this endogeneity concern, we perform several robustness tests, as follows.

4.2.1 Indexers versus Non-indexers

Following Derrien, Kecskés, and Thesmar (2013), and Kecskés, Mansi, and Nguyen (2014), our first approach to addressing this potential endogeneity problem and establishing causality is to use long-term indexers. Indexing by long-term investors is both exogenous and

relevant. First, indexers are passive investors that are widely diversified and do not trade much. They cannot choose their portfolio firms based on their labor investment efficiency because they must replicate an index. Therefore, long-term indexers are exogenous for our purposes.

Second, index funds do not have the flexibility to sell their holdings of stocks, and as a result of this inability to follow the "Wall Street Rule" they are more likely to try to influence the firms in which they invest through voice or private negotiations (Carleton, Nelson, and Weisbach, 1998; Del Guercio and Hawkins, 1999; Becht, Franks, Mayer, and Rossi, 2009; Fenn and Robinson, 2009). As Derrien, Kecskés, and Thesmar (2013) describe, indexers cannot be active investors but they can play an activist role. Indeed, a number of recent papers show that the presence of long-term indexers in a firm's ownership structure and/or the increase in their ownership following a firm's inclusion in an index can affect a wide range of corporate policies, including cash holdings (Harford, Kecskés, and Mansi, 2012), investment in stakeholder capital (Kecskés, Mansi, and Nguyen, 2014), innovation (Aghion, Van Reenen, and Zingales, 2013), capital structure (Michaely and Vincent, 2013), CEO turnover and capital expenditure (Mullins, 2014), and payout policy (Crane, Michenaud, and Weston, 2014).

To examine the effect of exogenous long-term indexers on abnormal net hiring, we rely on Bushee's (1998) classification of institutional investors.[10] Following Bushee (1998), we classify long-term investors into dedicated and quasi-indexed and we repeat our baseline analysis using these two new variables instead of either *Investor_Stability* or the aggregated measure of *Long-term_IO*.

Table 8 presents the results. In Models 1 and 2, we regress *Abnormal_Net_Hiring* on the percentage ownership of dedicated (*Dedicated_IO*) and quasi-indexed (*Quasi-indexed_IO*)

[10] We thank Brian Bushee for sharing his institutional investor classification data.

investors, respectively. In Model 3, we include both variables in the same regression. The results show that *Dedicated_IO* and *Quasi-indexed_IO* have similar impacts on *Abnormal_Net_Hiring:* the coefficient estimates for both are negative and significant. By showing that our results hold for exogenous long-term indexers, we are able to largely mitigate the concern that our results may be driven by self-selection.

4.2.2 Two-Stage Least Squares (2SLS)

To further alleviate the endogeneity concerns associated with *Investor_Stability*, we adopt an instrumental variable approach in which we use implied mutual fund trades induced by individual investor flows (*MFFlow*) as well as stock liquidity as instruments for *Investor_Stability*.

The idea for using our first instrument, *MFFlow*, follows from Coval and Stafford (2007) and Edmans, Goldstein, and Jiang (2012), who show that, when a mutual fund experiences large investor outflows, it is forced to liquidate a portion of its holdings to repay these investors. *MFFlow* satisfies the relevance and exclusion conditions of a valid instrument because the implied mutual fund trades will reduce a firm's *Investor_Stability* but not for reasons associated with firm characteristics such as labor investment. Our approach is similar to that of Michaely, Popadak, and Vincent (2014), who use *MFFlow* to establish a causal effect of institutional ownership on leverage. Following Edmans, Goldstein, and Jiang (2012), *MFFlow* is defined as the firm-specific annual dollar change in holdings implied by mutual fund investor outflows and previously disclosed mutual fund holdings. Specifically, *MFFlow,* for firm *i* in quarter *q,* is

$$MFFlow_{i,q} = \sum_{f=1}^{n} \frac{F_{j,q} * S_{i,j,q-1} * P_{i,q-1}}{TA_{j,q-1} * Vol_{i,q}} \quad (7)$$

where $F_{j,q}$ is the total outflow that fund j experiences in quarter q, $S_{i,j,q-1} * P_{i,q-1}$ is the dollar value of fund j's holdings of stock i at the end of the previous quarter, $TA_{j,q-1}$ is fund j's total assets at the end of the previous quarter, and $Vol_{i,q}$, is the total dollar trading volume of stock i in quarter q. The funds considered are those for which quarterly investor outflows equal or exceed 5% of total assets (i.e. $-F_{j,q}/TA_{j,q-1} \geq 5\%$). Finally, to compute the annual *MFFlow* for firm i, we sum $MFFlow_{i,q}$ across the four quarters in a given year.[11]

Our second instrument, *Liquidity*, is defined using the trade impact measure of Amihud (2002) multiplied by -1.[12] We expect *Investor_Stability* to be lower for more liquid firms because shareholders of these firms face lower transaction costs and a smaller price impact of winding down their positions if dissatisfied with the firm (Porter, 1992). However, we cannot see any reason why liquidity should be directly related to labor investment efficiency. Hence, we argue that *Liquidity* is a valid instrument in our setting.

Table 9 reports the impact of *Investor_Stability* on *Abnormal_Net_Hiring*, estimated via 2SLS. The results from the first-stage regression show that our two instruments have negative and significant impacts on *Investor_Stability*, as expected. Also, the first-stage F-statistic (169.75) rejects the hypothesis that our instruments are weak. The second-stage regression confirms our previous finding that *Investor_Stability* has a significantly negative impact on *Abnormal_Net_Hiring*. The test of over-identifying restrictions (J-statistic = 0.27) fails to reject the joint null hypothesis that our two instruments are uncorrelated with the error term, and are correctly excluded from the second-stage regression. Therefore, we conclude that our instruments are valid. It is also worth noting that the effect of *Investor_Stability* on

[11] We thank Alex Edmans for sharing his mutual fund flows data (accessed March 2014).

[12] Our results are qualitatively similar if we define *Liquidity* using the effective trading cost measure of Hasbrouck (2009).

Abnormal_Net_Hiring increases substantially under the instrumental variable specification. A one standard deviation increase in *Investor_Stability* leads to a reduction in *Abnormal_Net_Hiring* of 47.3% relative to the median, compared to the 11.3% decline in our baseline model. In summary, the 2SLS results confirm our previous findings: *Investor_Stability* continues to be negatively associated with *Abnormal_Net_Hiring*, even after controlling for endogeneity.

4.3 Controlling for Firm Governance

To further address the concern that long-term shareholders may be investing in firms with more efficient labor investments merely because they enjoy other superior governance practices, we carry out the following two tests.

Our first approach for controlling for a firm's governance involves including six corporate governance variables as additional controls in our regressions. We follow Bhagat and Bolton (2013) and consider the following five variables: the Gompers, Ishii, and Metrick (2003) corporate governance index (*G-index*), the Bebchuck, Cohen, and Ferrel (2009) entrenchment index (*E-index*), the natural log of the dollar value of common stock owned by the median director (*Direct_Own*), the percentage of board members classified as independent (*Ind_Direct*), and *CEO-Duality*, which is an indicator variable that takes the value of one if the CEO of the sample firm is also the board chair, and zero otherwise. We also include managerial ownership (*Manag_Own*), measured as the value of the CEO's stock and option portfolio, as an additional control variable (Daniel, Li, and Naveen, 2013). The results reported in Table 10 show that the impact of *Investor_Stability* on *Abnormal_Net_Hiring* survives the inclusion of standard corporate governance measures. The coefficient estimate for *Investor_Stability* remains negative

and highly significant in all models. Overall, the results in this section mitigate the concern that our findings may be driven by the quality of firms' other governance practices.

Second, we conduct a two-step analysis (non-tabulated) similar to those in Chen, Harford, and Li (2007) and Fich, Harford, and Tran (2014). The first stage of this analysis involves estimating a regression of *Investor_Stability* on firm size, lagged stock return, leverage, Tobin's Q, and the Gompers, Ishii, and Metrick (2003) corporate governance index (*G-index*). Next, we use the abnormal level of *Investor_Stability* (the residual from the above regression) as the key independent variable in a regression similar to our baseline model reported in Table 3. The abnormal level of *Investor_Stability* captures the investment horizon of the firm's institutional investors that is unexplained by the governance of the firm. The results of the second-stage regression show that the investment horizon of the firm's institutional investors, as captured by the abnormal level of *Investor_Stability*, has a negative and significant impact on the firm's *Abnormal_Net_Hiring*. This result adds support to the endogeneity tests in Section 4.2 and further mitigates the concern that our results may be driven by self-selection.

4.4 Controlling for Blockholdings and Managerial Ability

Blockholders play a critical role in the governance of firms because their sizable stakes give them incentives to bear the cost of monitoring managers.[13] An alternative explanation for our findings could be that blockholders tend to be more long-term because of the high costs associated with trading their large ownership stakes. If this is the case then our results may be driven not by the horizons of investors but by their ownership concentration. Therefore, it is

[13] Edmans (2014) provides a comprehensive survey of the theoretical and empirical literature on the role of blockholders in corporate governance.

important to control for the separate effect of block ownership in our regressions in order to alleviate this concern. We classify investors that own at least 5% of a firm's shares as blockholders and we repeat our main analysis after including the number of blockholders in a firm's ownership structure as an additional control variable. The results in Model 1 of Table 11 show that block ownership is negatively and significantly related to *Abnormal_Net_Hiring*, which is in line with a monitoring role being played by blockholders. However, controlling for the blockholdings does not affect the statistical and economic significance of the *Investor_Stability* coefficient.[14] This suggests that investor horizons and ownership concentration have distinct effects on labor investment efficiency.

If long-term shareholders invest in companies that happen to have more efficient labor investments simply because they have more able managers, then our results could be driven by managerial ability rather than investor horizons. To rule out this explanation, we control for managerial ability in our baseline regression. To define managerial ability, we use a measure proposed by Demerjian, Lev, and McVay (2012).[15] This measure is very relevant to our analysis as it defines managerial ability based on managers' efficiency, relative to their industry peers, in transforming corporate resources into revenues. As explained by Demerjian, Lev, and McVay (2012), this includes the ability to manage employees more efficiently. The results of Model 2 in Table 11 show that, consistent with Demerjian, Lev, and McVay (2012), firms experience less inefficiency in their labor investments when they have more able managers. However, the

[14] Our result for *Investor_Stability* is robust to the use of alternative measures of blockholdings, such as the total ownership of blockholders, total ownership of the five largest institutions, ownership of the largest institution, or ownership concentration.

[15] Demerjian, Lev, and McVay (2012) use data envelopment analysis to estimate firm efficiency. They then remove from the total firm efficiency measure any firm-specific characteristics that are expected to assist or hamper the management's efforts. The unexplained portion of firm efficiency is attributed to management ability.

coefficient on *Investor_Stability* remains statistically and economically significant, even after controlling for the effect of managerial ability.

4.5 Propensity Score Matching

Since the characteristics of firms with high *Investor_Stability* may differ from those with low *Investor_Stability*, we further use propensity score matching to test for the difference in *Abnormal_Net_Hiring* between firms with above-median *Investor_Stability* and matched firms with below-median *Investor_Stability*. The variables used in the matching are the control variables from our baseline specification. We report the results in Table 12. Depending on the matching technique used (e.g., the nearest neighborhood and Gaussian kernel matching techniques), we find that, on average, the abnormal net hiring of firms with high investor portfolio stability is 1.0 to 1.1 percentage points lower than that of matched firms with low investor portfolio stability. This result adds support to our main tests and further mitigates the concern that our findings may be driven by confounding effects.

5. Conclusion

This paper examines the relation between the investment horizon of institutional shareholders and the efficiency of their portfolio firms' labor investments. We argue that, because long-term investors are more likely to remain shareholders of the firm long enough to reap the benefits associated with optimal labor investment, they have stronger motives to influence firms' labor investment choices. Optimal employment decisions may not bring short-term benefits but should be reflected in stock prices over the long term. Thus, long-term investors are more likely to engage in monitoring to deter managers from deviating from the optimal level of labor investment.

Consistent with a monitoring role being played by long-term investors, we find that abnormal net hiring, measured as the absolute deviation from net hiring predicted by economic fundamentals, decreases in the presence of long-term investors. We further provide evidence that the presence of long-term investors mitigates both over-investment (over-hiring and under-firing) and under-investment (under-hiring) problems. This finding suggests that long-term investors are not simply linked with increases or reductions in labor investments, but in fact play an important role in ensuring that firms' employment levels are generally closer to those justified by economic fundamentals. We also show that the monitoring role of long-term investors is more pronounced for firms facing higher labor adjustment costs. This supports the argument that long-term investors play a stronger monitoring role when deviation from the optimal labor demand policy would be more costly to the firm.

To mitigate endogeneity concerns, we show that our results hold for both potentially endogenous long-term non-indexers and exogenous long-term indexers. We also conduct an instrumental variable analysis in which we use implied mutual fund flows and stock liquidity as instruments for *Investor_Stability*. The results from the 2SLS analysis support our main findings. Notably, our results are robust to the inclusion of standard corporate governance measures, as well as proxies for managerial ownership, blockholdings, and managerial ability. Overall, our findings suggest that institutional investors, and in particular their investment horizons, play an important role in firm-level employment decisions.

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Appendix A: Variable Definitions

Variable	Definition (Compustat data items in parentheses)
Ownership variables:	
Investor_Turnover	The weighted average of the turnover rates of all institutional investors in a firm's ownership structure (based on Gaspar, Massa, and Matos, 2005).
Investor_Stability	*Investor_Turnover* multiplied by -1.
Long-term_IO	The firm's percentage ownership held by investors in the bottom 33rd percentile of the average turnover rate.
Short-term_IO	The firm's percentage ownership held by investors in the top 33rd percentile of the average turnover rate.
Institutional Ownership	Percentage of shares owned by institutional investors.
Dedicated_IO	Percentage of shares owned by dedicated institutional investors (based on Bushee, 1998).
Quasi-indexed_IO	Percentage of shares owned by quasi-indexed institutional investors (based on Bushee, 1998).
Blockholdings	The number of institutions whose ownership is at least 5% of the firm's outstanding shares.
MFFlow	Firm-specific annual dollar change in holdings implied by mutual fund investor outflows and previously disclosed mutual fund holdings (based on Edmans, Goldstein, and Jiang, 2012).
Labor investment variables:	
Net_Hiring	Percentage change in the number of employees (*emp*).
Expected_Net_Hiring	Expected percentage change in the number of employees (*emp*) based on the Pinnuck and Lillis (2007) model.
Abnormal_Net_Hiring	|*Actual_Net_Hiring – Expected_Net_Hiring*|
Over-investment	Positive abnormal net hiring.
Under-investment	Negative abnormal net hiring.
Over-hiring	Over-investment when the expected level of net hiring is positive.
Under-firing	Over-investment when the expected level of net hiring is negative.
Under-hiring	Under-investment when the expected level of net hiring is positive.
Over-firing	Under-investment when the expected level of net hiring is negative.
Firm characteristics:	
Sales_Growth	Percentage change in sales revenue (*sale*).
Profit	Net income (*ni*) scaled by beginning-of-year total assets (*at*).
Δ*Profit*	The change in net income (*ni*) scaled by beginning-of-year total assets (*at*).
Return	Total stock return in the last 12 months.
Size	The logarithm of the firm's book value of assets (*at*).
Quick_Ratio	The ratio of cash and short-term investments (*che*) plus receivables (*rect*) to current liabilities (*lct*).
Leverage	Long-term debt (*dltt*) plus debt in current liabilities (*dlc*), all scaled by the book value of assets (*at*).
Loss_Bins	Five dummy variables indicating each interval of profitability of length 0.005 from 0 to -0.025. For example, Loss_Bin1 takes the value of one if Profit is between -0.005 and 0 and zero otherwise, and so on for the other Loss_Bins.
Market-to-book	Book value of assets (*at*) plus the market value of common equity (*prcc_f* × *csho*) minus the book value of common equity (*ceq*), all scaled by the book value of assets (*at*).

Dividend Dummy	A dummy variable set equal to one in years in which a firm pays common dividends (*dvc*), and zero otherwise.
Cash Flow Volatility	The standard deviation of the ratio of firm-level cash flow (*oibdp – xint – txt – dvc*) to assets (*at*) for the previous five years.
Sales Volatility	The standard deviation of firm-level sales revenue (*sale*) for the previous five years.
Net Hiring Volatility	The standard deviation of a firm's *Net_Hiring* for the previous five years.
Tangibility	The ratio of property, plant, and equipment (*ppent*) to total assets (*at*).
Loss Dummy	A dummy variable set equal to one in years in which a firm makes a loss (*Profit* < 0).
Labor Intensity	The ratio of the number of employees (*emp*) to total assets (*at*).
Abn_Non-labor_Invest	Abnormal non-labor investments, defined as the absolute value of the residual from the regression of *Non-labor_Invest* on *Sales_Growth* where *Non-labor_Invest* is measured as the sum of capital expenditure (*capx*), acquisition expenditure (*aqc*), and research and development expenditure (*xrd*), less cash receipts from the sale of property, plant, and equipment (*sppe*), all scaled by lagged total assets.
Labor_Skill	A firm's reliance on skilled labor measured as $\text{Labor\_Skill}_i = \sum_{j=1}^{O}\left(\frac{E_{ji}}{E_i} * Z_j\right)$, where E_{ji} is the number of employees in industry i working in occupation j, E_i is the total number of employees in industry i, O is the total number of occupations in industry i, and Z_j is the U.S. Department of Labor's O*NET program classification of occupations based on skill level.
Liquidity	The trade impact measure of Amihud (2002) multiplied by -1.

Governance variables:

G-index	The Gompers, Ishii, and Metrick (2003) corporate governance index of 24 antitakeover provisions.
E-index	The Bebchuck, Cohen, and Ferrel (2009) managerial entrenchment index.
Direct_Own	The natural log of the dollar value of common stock owned by the median director (based on Bhagat and Bolton, 2013).
Ind_Direct	The percentage of board members classified as independent.
CEO-Duality	An indicator variable that takes the value of one if the CEO of the sample firm is also the board chair, and zero otherwise.

Managerial characteristics:

Manag_Own	The value of the CEO's stock and option portfolio (based on Daniel, Li, and Naveen, 2013).
Managerial Ability	Managers' efficiency, relative to their industry peers, in transforming corporate resources to revenues (based on Demerjian, Lev, and McVay, 2012).

Appendix B: Table B.1. Estimation of the Expected Level of Net Hiring

This table reports the regression results for the estimation of the expected level of net hiring using Pinnuck and Lillis' (2007) model. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

		Dependent variable: Net Hiring
Variables	Predicted Sign	
Sales_Growth $_{t}$	+	0.317***
		(0.00)
Sales_Growth $_{t-1}$	+	0.057***
		(0.00)
Profit $_{t}$	+	0.177***
		(0.00)
ΔProfit $_{t}$	-	-0.217***
		(0.00)
ΔProfit $_{t-1}$	+	-0.042***
		(0.01)
Return $_{t}$	+	0.030***
		(0.00)
Size $_{t-1}$	+	0.003***
		(0.00)
Quick_Ratio $_{t-1}$	+	0.005***
		(0.00)
ΔQuick_Ratio $_{t-1}$	+	0.023***
		(0.00)
ΔQuick_Ratio $_{t}$	+/-	-0.031***
		(0.00)
Leverage $_{t-1}$	-	-0.046***
		(0.00)
Loss_Bin1 $_{t-1}$	-	-0.028***
		(0.00)
Loss_Bin2 $_{t-1}$	-	-0.021***
		(0.00)
Loss_Bin3 $_{t-1}$	-	-0.031***
		(0.00)
Loss_Bin4 $_{t-1}$	-	-0.004
		(0.68)
Loss_Bin5 $_{t-1}$	-	-0.000
		(0.97)
Intercept	+/-	-0.017***
		(0.00)
Industry fixed effects		Yes
Observations		33,715
Adjusted R^2		0.24

Table 1. Summary Statistics

This table presents summary statistics for the labor investment, ownership, and control variables used in our main analysis. We also report descriptive statistics for the control variables used in the estimation of the expected level of net hiring. Our sample consists of 41,819 firm-year observations representing 6,391 unique firms over the period 1983 to 2010. All variables are defined in Appendix A.

Variable	Mean	Std. Dev.	Median	Q1	Q4
Labor investment variables:					
Actual_Net_Hiring	0.065	0.255	0.026	-0.045	0.128
Expected_Net_Hiring	0.057	0.117	0.047	-0.000	0.098
Abnormal_Net_Hiring	0.120	0.169	0.070	0.032	0.140
Ownership variables:					
Investor_Turnover	0.203	0.056	0.198	0.168	0.231
Long-term_IO	0.092	0.078	0.076	0.029	0.136
Short-term_IO	0.155	0.129	0.129	0.044	0.236
Institutional Ownership	0.455	0.268	0.455	0.225	0.679
Other variables:					
Sales_Growth	0.133	0.358	0.080	-0.015	0.205
Profit	0.014	0.180	0.046	-0.009	0.094
Return	0.187	0.699	0.077	-0.210	0.400
Size	5.898	1.935	5.707	4.493	7.158
Quick_Ratio	1.905	2.081	1.246	0.797	2.139
Leverage	0.216	0.206	0.185	0.033	0.330
Market-to-book	2.740	3.502	1.948	1.183	3.297
Dividend Dummy	0.402	0.490	0.000	0.000	1.000
Cash Flow Volatility	0.071	0.090	0.048	0.028	0.082
Sales Volatility	0.181	0.176	0.129	0.074	0.226
Tangibility	0.291	0.221	0.234	0.117	0.411
Loss Dummy	0.270	0.444	0.000	0.000	1.000
Net Hiring Volatility	0.241	0.435	0.137	0.074	0.252
Labor Intensity	0.008	0.010	0.005	0.003	0.010
Abn_Non-labor_Invest	0.098	0.111	0.078	0.041	0.114

Table 2. Correlation Matrix and Univariate Analysis

This table presents pair-wise correlations and univariate test results. Panel A reports correlation coefficients between our main ownership variables and abnormal net hiring. Panel B reports mean and median *Abnormal_Net_Hiring* values for the full sample and two subsamples of firms according to their investor portfolio stability (i.e., firms with above- and below-median *Investor_Stability*). All variables are defined in Appendix A. The sample period is 1983-2010. N denotes the number of observations. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Correlation between Main Ownership Variables and Abnormal Net Hiring

	Ab_N_H	Inv_St	IO	LTIO	STIO
Abnormal_Net_Hiring $_{t}$	1.000				
Investor_Stability $_{t-1}$	-0.092***	1.000			
Institutional Ownership $_{t-1}$	-0.074***	-0.147***	1.000		
Long-term_IO $_{t-1}$	-0.115***	0.341***	0.561***	1.000	
Short-term_IO $_{t-1}$	0.010*	-0.550***	0.752***	0.152***	1.000

Panel B. Univariate Analysis

	Overall sample (N=33,792)	Firms with below-median Inv_Stability (N=16,829)	Firms with above-median Inv_Stability (N=16,963)	Difference in means (medians) (1) - (2)
Means:				
Abnormal_Net_Hiring $_{t}$	0.120	0.133	0.107	0.026***
Medians:				
Abnormal_Net_Hiring $_{t}$	0.070	0.077	0.066	0.011***

Table 3. The Relation between Investor Horizons and Abnormal Net Hiring

This table reports the regression results on the impact of institutional investment horizons on abnormal net hiring. In Model 1, we regress *Abnormal_Net_Hiring* on the set of control variables. In Model 2, we include *Investor_Stability* as an additional explanatory variable. In Model 3, we use long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership as our main independent variables in place of *Investor_Stability*. All regressions include year and industry fixed effects. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Abnormal_Net_Hiring $_t$		
Variables	(1)	(2)	(3)
Investor_Stability $_{t-1}$		-0.143***	
		(0.00)	
Long-term_IO $_{t-1}$			-0.069***
			(0.00)
Short-term_IO $_{t-1}$			0.021***
			(0.01)
Institutional Ownership $_{t-1}$	-0.012***	-0.015***	
	(0.00)	(0.00)	
Market-to-book $_{t-1}$	0.000	0.000	0.000
	(0.61)	(0.93)	(0.80)
Size $_{t-1}$	-0.003***	-0.004***	-0.004***
	(0.00)	(0.00)	(0.00)
Quick_Ratio $_{t-1}$	0.007***	0.007***	0.007***
	(0.00)	(0.00)	(0.00)
Leverage $_{t-1}$	0.021***	0.021***	0.022***
	(0.00)	(0.00)	(0.00)
Dividend Dummy $_{t-1}$	-0.009***	-0.007***	-0.007***
	(0.00)	(0.00)	(0.00)
Cash Flow Volatility $_{t-1}$	0.106***	0.099***	0.105***
	(0.00)	(0.00)	(0.00)
Sales Volatility $_{t-1}$	0.034***	0.031***	0.032***
	(0.00)	(0.00)	(0.00)
Tangibility $_{t-1}$	-0.025***	-0.025***	-0.024***
	(0.00)	(0.00)	(0.00)
Loss Dummy $_{t-1}$	0.011***	0.012***	0.012***
	(0.00)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.031***	0.030***	0.031***
	(0.00)	(0.00)	(0.00)
Labor Intensity $_{t-1}$	-0.731***	-0.713***	-0.715***
	(0.00)	(0.00)	(0.00)
Abn_Non-labor_Invest $_t$	0.405***	0.404***	0.403***
	(0.00)	(0.00)	(0.00)
Intercept	0.073***	0.052***	0.076***
	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	33,715	33,715	33,715
Adjusted R^2	0.14	0.14	0.14

Table 4. The Relation between Investor Horizon and Over-investment in Labor

This table reports the regression results on the impact of institutional investment horizon on abnormal net hiring for over-investing firms. In Models 1, 3, and 5, we regress *Abnormal_Net_Hiring* on *Investor_Stability* and the set of control variables. In Models 2, 4, and 6, we replace *Investor_Stability*, our main proxy for investor horizons, with long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership. In Models 1 and 2, we estimate equation (6) for a subsample of over-investing firms where over-investment is defined as positive abnormal net hiring. In Models 3–6, we further decompose over-investment into over-hiring and under-firing. A firm over-hires (under-fires) if it over-invests when its expected level of net hiring is positive (negative). All regressions include year and industry fixed effects. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Over-investment		Over-hiring		Under-firing	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Investor_Stability $_{t-1}$	-0.197***		-0.250***		-0.045	
	(0.00)		(0.00)		(0.49)	
Long-term_IO $_{t-1}$		-0.129***		-0.125***		-0.112***
		(0.00)		(0.00)		(0.00)
Short-term_IO $_{t-1}$		0.026		0.016		0.022
		(0.11)		(0.41)		(0.47)
Institutional Ownership $_{t-1}$	-0.028***		-0.036***		-0.016	
	(0.00)		(0.00)		(0.28)	
Market-to-book $_{t-1}$	-0.000	-0.000	-0.001*	-0.001	0.002	0.002
	(0.76)	(0.85)	(0.06)	(0.11)	(0.15)	(0.15)
Size $_{t-1}$	-0.004***	-0.005***	-0.005***	-0.005***	-0.004*	-0.005*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.05)
Quick_Ratio $_{t-1}$	0.008***	0.008***	0.008***	0.009***	0.004	0.004
	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.14)
Leverage $_{t-1}$	0.015	0.016	0.025	0.027*	0.022	0.022
	(0.20)	(0.16)	(0.10)	(0.07)	(0.20)	(0.21)
Dividend Dummy $_{t-1}$	-0.007	-0.006	-0.008	-0.008	-0.007	-0.006
	(0.10)	(0.16)	(0.16)	(0.17)	(0.24)	(0.35)
Cash Flow Volatility $_{t-1}$	0.062*	0.070**	-0.021	-0.007	0.212***	0.211***
	(0.08)	(0.05)	(0.59)	(0.85)	(0.00)	(0.00)
Sales Volatility $_{t-1}$	0.067***	0.067***	0.086***	0.087***	0.021	0.020
	(0.00)	(0.00)	(0.00)	(0.00)	(0.40)	(0.41)
Tangibility $_{t-1}$	-0.049***	-0.048***	-0.065***	-0.063***	-0.018	-0.017
	(0.00)	(0.00)	(0.00)	(0.00)	(0.39)	(0.42)
Loss Dummy$_{t-1}$	-0.010**	-0.009*	0.000	0.001	0.001	0.002
	(0.04)	(0.06)	(0.96)	(0.93)	(0.82)	(0.78)
Net Hiring Volatility $_{t-1}$	0.038***	0.039***	0.036***	0.037***	0.038**	0.037**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)
Labor Intensity $_{t-1}$	-1.766***	-1.761***	-1.886***	-1.876***	-1.375**	-1.366**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Abn_Non-labor_Invest $_{t}$	0.485***	0.485***	0.498***	0.497***	0.356***	0.356***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	0.081***	0.115***	0.056***	0.101***	0.045*	0.058***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,861	13,861	10,276	10,276	3,585	3,585
Adjusted R^2	0.16	0.16	0.16	0.16	0.15	0.15

Table 5. The Relation between Investor Horizon and Under-investment in Labor

This table reports the regression results on the impact of institutional investment horizon on abnormal net hiring for under-investing firms. In Models 1, 3, and 5, we regress *Abnormal_Net_Hiring* on *Investor_Stability* and the set of control variables. In Models 2, 4, and 6, we replace *Investor_Stability*, our main proxy for investor horizons, with long-term (*Long-term_IO*) and short-term (*Short-term_IO*) institutional ownership. In Models 1 and 2, we estimate equation (6) for a subsample of under-investing firms, where under-investment is defined as negative abnormal net hiring. In Models 3–6, we further decompose under-investment into under-hiring and over-firing. A firm under-hires (over-fires) if it under-invests when its expected level of net hiring is positive (negative). All regressions include year and industry fixed effects. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Under-investment		Under-hiring		Over-firing	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Investor_Stability $_{t-1}$	-0.068***		-0.086***		-0.015	
	(0.00)		(0.00)		(0.66)	
Long-term_IO $_{t-1}$		-0.029***		-0.031**		0.005
		(0.00)		(0.01)		(0.83)
Short-term_IO $_{t-1}$		0.003		0.005		0.002
		(0.69)		(0.60)		(0.87)
Institutional Ownership $_{t-1}$	-0.011***		-0.014***		0.002	
	(0.00)		(0.00)		(0.79)	
Market-to-book $_{t-1}$	-0.000	-0.000	-0.000	-0.000	0.001	0.001
	(0.85)	(0.93)	(0.80)	(0.88)	(0.11)	(0.11)
Size $_{t-1}$	-0.003***	-0.003***	-0.003***	-0.003***	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.23)
Quick_Ratio $_{t-1}$	0.007***	0.007***	0.008***	0.008***	0.003**	0.003**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)
Leverage $_{t-1}$	0.030***	0.030***	0.046***	0.046***	-0.018**	-0.018**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)
Dividend Dummy$_{t-1}$	-0.005***	-0.005***	-0.002	-0.003	-0.006	-0.006
	(0.00)	(0.00)	(0.23)	(0.21)	(0.15)	(0.14)
Cash Flow Volatility $_{t-1}$	0.156***	0.160***	0.198***	0.203***	0.056**	0.056**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)
Sales Volatility $_{t-1}$	-0.004	-0.003	-0.010	-0.009	0.008	0.008
	(0.52)	(0.62)	(0.20)	(0.28)	(0.48)	(0.46)
Tangibility $_{t-1}$	-0.012**	-0.011*	-0.007	-0.005	-0.032***	-0.032***
	(0.04)	(0.05)	(0.33)	(0.44)	(0.00)	(0.00)
Loss Dummy $_{t-1}$	0.032***	0.032***	0.040***	0.040***	0.010***	0.010***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.025***	0.026***	0.029***	0.030***	0.016***	0.016***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Labor Intensity $_{t-1}$	0.288**	0.285**	0.244*	0.247*	0.395*	0.392*
	(0.02)	(0.01)	(0.07)	(0.07)	(0.07)	(0.08)
Abn_Non-labor_Invest $_{t}$	0.150***	0.149***	0.145***	0.145***	0.128***	0.127***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	0.052***	0.062***	0.042***	0.055***	0.115***	0.118***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,854	19,854	14,948	14,948	4,906	4,906
Adjusted R^2	0.15	0.15	0.19	0.19	0.07	0.07

Table 6. Moderating Effect of Labor Adjustment Costs

This table presents the impact of institutional investment horizon on abnormal net hiring for firms facing high labor adjustment costs (LACs) versus firms facing low LACs. We proxy for LACs using firms' reliance on skilled labor (*Labor_Skill*). For each year, we define firms with above- (below-) median *Labor_Skill* as high (low) LAC firms. The last row reports the p-values of the *F*-tests for differences in the coefficients on *Investor_Stability* for the two subsamples of high and low LAC firms. All regressions include year and industry fixed effects. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Whole Sample		Over-investment		Under-investment	
Variables	High LACs (1)	Low LACs (2)	High LACs (3)	Low LACs (4)	High LACs (5)	Low LACs (6)
Investor_Stability $_{t-1}$	-0.218***	-0.073*	-0.285***	-0.092	-0.150***	-0.045
	(0.00)	(0.09)	(0.00)	(0.23)	(0.00)	(0.26)
Institutional Ownership $_{t-1}$	-0.021***	-0.010	-0.029**	-0.016	-0.016**	-0.012**
	(0.00)	(0.14)	(0.03)	(0.29)	(0.04)	(0.02)
Market-to-book $_{t-1}$	-0.000	-0.000	0.001	-0.001	-0.001**	0.001
	(0.98)	(0.82)	(0.27)	(0.55)	(0.05)	(0.43)
Size $_{t-1}$	-0.003***	-0.003**	-0.004	-0.003	-0.003**	-0.002*
	(0.00)	(0.01)	(0.11)	(0.29)	(0.01)	(0.06)
Quick_Ratio $_{t-1}$	0.007***	0.004***	0.007***	0.006**	0.008***	0.004**
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.02)
Leverage $_{t-1}$	0.035**	0.001	0.028	0.004	0.041**	0.001
	(0.02)	(0.95)	(0.11)	(0.86)	(0.03)	(0.93)
Dividend Dummy$_{t-1}$	-0.004	-0.006*	-0.003	-0.008	-0.003	-0.003
	(0.38)	(0.09)	(0.71)	(0.29)	(0.48)	(0.39)
Cash Flow Volatility $_{t-1}$	0.119***	0.189***	0.112**	0.195***	0.145***	0.182***
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
Sales Volatility $_{t-1}$	-0.029**	0.035**	-0.017	0.071**	-0.039***	0.008
	(0.04)	(0.01)	(0.53)	(0.01)	(0.00)	(0.52)
Tangibility $_{t-1}$	-0.053***	0.003	-0.055*	-0.004	-0.054***	-0.002
	(0.00)	(0.78)	(0.06)	(0.86)	(0.00)	(0.88)
Loss Dummy $_{t-1}$	0.017***	0.008*	-0.005	-0.011	0.038***	0.019***
	(0.00)	(0.09)	(0.50)	(0.21)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.027***	0.033***	0.035***	0.054***	0.020***	0.025***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Labor Intensity $_{t-1}$	-0.268	-0.690***	-1.615***	-1.460***	0.898***	-0.022
	(0.41)	(0.00)	(0.01)	(0.00)	(0.00)	(0.91)
Abn_Non-labor_Invest $_{t}$	0.301***	0.430***	0.364***	0.477***	0.129***	0.240***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	0.194***	0.034**	-0.012	0.019	0.210***	0.041***
	(0.00)	(0.03)	(0.73)	(0.55)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,979	7,515	3,780	2,857	5,199	4,658
Adjusted R^2	0.15	0.14	0.14	0.16	0.19	0.13
p-value (*F*-test of equal coefficient estimates on Investor_Stability)	(0.01)		(0.07)		(0.07)	

Table 7. Alternative Proxies for the Expected Level of Net Hiring

This table presents the results of robustness tests in which we replicate our main analysis using several alternative measures of expected net hiring. In Models 1–4, we regress *Abnormal_Net_Hiring* on *Investor_Stability* and the set of control variables. In Model 1, we estimate expected net hiring using the Pinnuck and Lillis (2007) model with industry and time fixed effects. In Model 2, we estimate expected net hiring using the Pinnuck and Lillis (2007) model after adding time effects and replacing the industry dummies with firm fixed effects. In Model 3, we estimate expected net hiring using the median investment in the firm's industry. Industries are defined using the Fama-French (1997) 48-industry classification. In Model 4, we measure expected net hiring using the firm's average investment in the previous three years. All regressions include year and industry fixed effects. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	Pinnuck & Lillis model with year and industry effects (1)	Pinnuck & Lillis model with year and firm effects (2)	Expected Net Hiring = industry median (3)	Expected Net Hiring = average in previous three years (4)
Investor_Stability $_{t-1}$	-0.138***	-0.128***	-0.202***	-0.160***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Ownership $_{t-1}$	-0.016***	-0.014***	-0.009*	-0.006
	(0.00)	(0.00)	(0.06)	(0.34)
Market-to-book $_{t-1}$	-0.000	-0.000	0.001	-0.001
	(0.89)	(0.22)	(0.14)	(0.19)
Size $_{t-1}$	-0.003***	-0.003***	-0.004***	-0.001
	(0.00)	(0.00)	(0.00)	(0.33)
Quick_Ratio $_{t-1}$	0.007***	0.008***	0.005***	0.006***
	(0.00)	(0.00)	(0.00)	(0.00)
Leverage $_{t-1}$	0.021***	0.023***	0.001	0.027***
	(0.00)	(0.00)	(0.88)	(0.00)
Dividend Dummy $_{t-1}$	-0.007***	-0.006**	-0.016***	-0.016***
	(0.00)	(0.02)	(0.00)	(0.00)
Cash Flow Volatility $_{t-1}$	0.096***	0.092***	0.031	0.022
	(0.00)	(0.00)	(0.16)	(0.56)
Sales Volatility $_{t-1}$	0.031***	0.030***	0.053***	0.123***
	(0.00)	(0.00)	(0.00)	(0.00)
Tangibility $_{t-1}$	-0.023***	-0.027***	-0.040***	-0.050***
	(0.00)	(0.00)	(0.00)	(0.00)
Loss Dummy$_{t-1}$	0.012***	0.012***	0.012***	0.018***
	(0.00)	(0.00)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.030***	0.028***	0.031***	0.128***
	(0.00)	(0.00)	(0.00)	(0.00)
Labor Intensity $_{t-1}$	-0.710***	-0.663***	-0.885***	-1.018***
	(0.00)	(0.00)	(0.00)	(0.00)
Abn_Non-labor_Invest $_{t}$	0.393***	0.393***	0.500***	0.417***
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	0.050***	0.060***	0.063***	0.071***
	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	33,715	33,715	33,715	23,054
Adjusted R^2	0.14	0.14	0.15	0.18

Table 8. Endogeneity Concerns: Indexers versus Non-indexers

This table presents the results of our baseline regression after we classify long-term investor ownership into long-term non-indexer (dedicated) ownership and long-term indexer (quasi-indexed) ownership. In Models 1 and 2, we regress *Abnormal_Net_Hiring* on the percentage ownership of dedicated (*Dedicated_IO*) and quasi-indexed (*Quasi-indexed_IO*) investors, respectively. In Model 3, we include both variables in the same regression. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Abnormal_Net_Hiring $_t$		
Variables	(1)	(2)	(3)
Dedicated_IO $_{t-1}$	-0.041***		-0.035***
	(0.00)		(0.01)
Quasi-indexed_ IO $_{t-1}$		-0.030***	-0.031***
		(0.00)	(0.00)
Market-to-book $_{t-1}$	-0.000	0.000	-0.000
	(0.83)	(0.68)	(0.81)
Size $_{t-1}$	-0.003***	-0.003***	-0.003***
	(0.00)	(0.00)	(0.00)
Quick_Ratio $_{t-1}$	0.008***	0.007***	0.008***
	(0.00)	(0.00)	(0.00)
Leverage $_{t-1}$	0.023***	0.020***	0.021***
	(0.00)	(0.00)	(0.00)
Dividend Dummy $_{t-1}$	-0.009***	-0.008***	-0.008***
	(0.00)	(0.00)	(0.00)
Cash Flow Volatility $_{t-1}$	0.096***	0.104***	0.092***
	(0.00)	(0.00)	(0.00)
Sales Volatility $_{t-1}$	0.036***	0.033***	0.034***
	(0.00)	(0.00)	(0.00)
Tangibility $_{t-1}$	-0.024***	-0.025***	-0.026***
	(0.00)	(0.00)	(0.00)
Loss Dummy$_{t-1}$	0.010***	0.011***	0.010***
	(0.00)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.035***	0.031***	0.034***
	(0.00)	(0.00)	(0.00)
Labor Intensity $_{t-1}$	-0.676***	-0.725***	-0.681***
	(0.00)	(0.00)	(0.00)
Abn_Non-labor_Invest $_t$	0.414***	0.405***	0.415***
	(0.00)	(0.00)	(0.00)
Intercept	0.071***	0.074***	0.075***
	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	29,173	33,715	29,173
Adjusted R^2	0.15	0.14	0.15

Table 9. Endogeneity Concerns: Instrumental Variable Regressions

This table presents the results of a two-stage least squares regression in which we use implied mutual fund trades induced by individual investor flows (*MFFlow*) and stock liquidity as instruments for *Investor_Stability*. In the first-stage regression, we regress *Investor_Stability* on the control and instrumental variables. In the second-stage regression, we regress *Abnormal_Net_Hiring* on the predicted *Investor_Stability* together with the other control variables. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	2SLS	
Variables	1st Stage	2nd Stage
Investor_Stability $_{t-1}$		-0.600***
		(0.00)
Institutional Ownership $_{t-1}$	-0.032***	-0.029***
	(0.00)	(0.00)
Market-to-book $_{t-1}$	-0.000***	-0.001
	(0.01)	(0.27)
Size $_{t-1}$	0.008***	-0.004***
	(0.00)	(0.00)
Quick_Ratio $_{t-1}$	-0.000**	0.006***
	(0.04)	(0.00)
Leverage $_{t-1}$	-0.015***	0.019**
	(0.00)	(0.02)
Dividend Dummy $_{t-1}$	0.013***	-0.002
	(0.00)	(0.55)
Cash Flow Volatility $_{t-1}$	-0.025***	0.072***
	(0.00)	(0.00)
Sales Volatility $_{t-1}$	-0.013***	0.029***
	(0.00)	(0.00)
Tangibility $_{t-1}$	0.003	-0.029***
	(0.30)	(0.00)
Loss Dummy$_{t-1}$	0.004***	0.016***
	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	-0.005***	0.026***
	(0.00)	(0.00)
Labor Intensity $_{t-1}$	0.086*	-0.716***
	(0.08)	(0.00)
Abn_Non-labor_Invest $_{t}$	-0.008***	0.428***
	(0.00)	(0.00)
MFFlow $_{t-1}$	-0.001***	
	(0.00)	
Liquidity $_{t-1}$	-0.006***	
	(0.00)	
Intercept	-0.198***	-0.033
	(0.00)	(0.26)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	24,304	24,304
Adjusted R^2	0.29	0.14
F-statistic	169.75	
J-statistic (p-value)		(0.27)

Table 10. Controlling for Corporate Governance

This table reports the regression results on the impact of institutional investment horizons on abnormal net hiring, controlling for several firm-level corporate governance variables. G-index is the Gompers, Ishii, and Metrick (2003) corporate governance index of 24 antitakeover provisions. E-index is the Bebchuck, Cohen, and Ferrel (2009) managerial entrenchment index. Direct_Own is the natural log of the dollar value of common stock owned by the median director (based on Bhagat and Bolton, 2013). Ind_Direct is the percentage of board members classified as independent. CEO-Duality is an indicator variable that takes the value of one if the CEO of the sample firm is also the board chair, and zero otherwise. Manag_Own is the value of the CEO's stock and option portfolio (based on Daniel, Li, and Naveen, 2013). All the other variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	G-index (1)	E-index (2)	Direct_Own (3)	Ind_Direct (4)	CEO-Duality (5)	Manag_Own (6)
Investor_Stability $_{t-1}$	-0.144**	-0.145**	-0.143**	-0.133**	-0.131**	-0.201***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.00)
Corporate Governance $_{t-1}$	-0.000	-0.001	-0.002	0.024*	-0.000	0.000
	(0.53)	(0.37)	(0.14)	(0.09)	(0.97)	(0.77)
Institutional Ownership $_{t-1}$	0.004	0.005	-0.007	-0.005	-0.001	-0.018**
	(0.69)	(0.63)	(0.53)	(0.71)	(0.93)	(0.04)
Market-to-book $_{t-1}$	0.000	0.000	0.000	0.000	0.000	0.000
	(0.68)	(0.69)	(0.51)	(0.62)	(0.56)	(0.72)
Size $_{t-1}$	-0.002	-0.002*	-0.002	-0.003**	-0.003**	-0.004***
	(0.12)	(0.09)	(0.18)	(0.02)	(0.04)	(0.00)
Quick_Ratio $_{t-1}$	0.007***	0.007***	0.007***	0.006***	0.006***	0.006***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage $_{t-1}$	0.041***	0.041***	0.035**	0.034**	0.034**	0.022**
	(0.00)	(0.00)	(0.02)	(0.02)	(0.02)	(0.04)
Dividend Dummy $_{t-1}$	-0.005	-0.005	-0.008**	-0.008*	-0.007*	-0.000
	(0.22)	(0.19)	(0.04)	(0.06)	(0.07)	(0.89)
Cash Flow Volatility $_{t-1}$	0.048	0.047	0.068	0.042	0.045	0.043
	(0.38)	(0.39)	(0.16)	(0.28)	(0.25)	(0.29)
Sales Volatility $_{t-1}$	0.039**	0.039**	0.033**	0.038**	0.040***	0.053***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)
Tangibility $_{t-1}$	0.002	0.002	0.008	0.008	0.009	-0.018*
	(0.89)	(0.85)	(0.53)	(0.52)	(0.45)	(0.08)
Loss Dummy$_{t-1}$	0.011**	0.011**	0.014**	0.016***	0.016***	0.012***
	(0.02)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.025**	0.025**	0.027**	0.025**	0.025**	0.031***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Labor Intensity $_{t-1}$	-0.630***	-0.641***	-0.602***	-0.762***	-0.757***	-1.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Abn_Non-labor_Invest $_{t}$	0.374***	0.374***	0.388***	0.397***	0.397***	0.423***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	0.052***	0.051**	0.073***	0.050**	0.024	0.044***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.25)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,991	5,991	6,279	6,476	6,502	13,351
Adjusted R^2	0.14	0.14	0.14	0.15	0.15	0.15

Table 11. Controlling for Blockholdings and Managerial Ability

This table reports the regression results on the impact of institutional investment horizon on abnormal net hiring, controlling for blockholding and managerial ability. All variables are defined in Appendix A. The p-values in parentheses are based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Abnormal_Net_Hiring $_t$	
Variables	(1)	(2)
Investor_Stability $_{t-1}$	-0.136***	-0.144***
	(0.00)	(0.00)
Blockholders $_{t-1}$	-0.001*	
	(0.06)	
Managerial Ability $_{t-1}$		-0.026***
		(0.00)
Market-to-book $_{t-1}$	-0.000	0.000
	(0.92)	(0.70)
Size $_{t-1}$	-0.004***	-0.003***
	(0.00)	(0.00)
Quick_Ratio $_{t-1}$	0.007***	0.007***
	(0.00)	(0.00)
Leverage $_{t-1}$	0.022***	0.020***
	(0.00)	(0.00)
Dividend Dummy $_{t-1}$	-0.007***	-0.007***
	(0.00)	(0.00)
Cash Flow Volatility $_{t-1}$	0.100***	0.095***
	(0.00)	(0.00)
Sales Volatility $_{t-1}$	0.032***	0.036***
	(0.00)	(0.00)
Tangibility $_{t-1}$	-0.024***	-0.029***
	(0.07)	(0.00)
Loss Dummy$_{t-1}$	0.012***	0.009***
	(0.00)	(0.00)
Net Hiring Volatility $_{t-1}$	0.031***	0.030***
	(0.00)	(0.00)
Labor Intensity $_{t-1}$	-0.704***	-0.641***
	(0.00)	(0.00)
Abn_Non-labor_Invest $_t$	0.403***	0.404***
	(0.00)	(0.00)
Intercept	0.053***	0.049***
	(0.00)	(0.00)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	33,695	33,438
Adjusted R^2	0.14	0.14

Table 12. Propensity Score Matching

This table reports the results of the propensity score matching used to test for the difference in abnormal net hiring between firms with above-median investor portfolio stability and matched firms with below-median investor portfolio stability, using the nearest neighborhood and Gaussian kernel matching techniques. We use all the control variables from our baseline specification to perform the matching. Bootstrapped standard errors are based on 50 replications with replacement. Bias-corrected 95% confidence intervals are reported in brackets and p-values in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Nearest neighborhood	Gaussian kernel
Difference in Abnormal_Net_Hiring between above-median and matched below-median Investor_Stability firms	-0.010*** (0.00) [-0.014, -0.006]	-0.011*** (0.00) [-0.013, 0.006]