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THE EFFECT OF MANAGERS ON SYSTEMATIC RISK

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ABSTRACT

Tracking the movement of top managers across firms, we document the importance of manager-specific fixed effects in explaining heterogeneity in firm exposures to systematic risk. These differences in systematic risk are partially explained by managers' corporate strategies, such as their preferences for internal growth and financial conservatism. Managers' early-career experiences of starting their first job in a recession also contribute to differential loadings on systematic risk. These effects are more pronounced for smaller firms. Overall, our results suggest that managerial styles have important implications for asset prices.

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1 Introduction

A key principle in asset pricing theory is that investors are compensated for bearing systematic risk, but not idiosyncratic risk (Cochrane 2005). Drawing on this insight, empirical asset pricing models decompose stock return variability into systematic and idiosyncratic components (e.g., Fama and French 2015, 2018). The systematic risk of a stock is determined by its beta, which measures the sensitivity of the stock's return to common risk factors such as the market factor. In an effort to uncover the underlying sources of systematic risk, a large literature investigates the determinants of beta.[1] The general conclusion from these studies is that a large amount of variation in systematic risk cannot be explained by firm-, industry-, or market-level variables.[2] In this paper, we ask whether manager-specific differences account for part of this unexplained variation.

A growing body of research suggests that CEOs and other top executives exhibit large person-specific differences in their management styles. Bertrand and Schoar (2003) document that such person-specific styles explain a significant amount of variation in firms' capital structures, investment decisions, and organizational structures. The notion that CEOs differ in their styles is reinforced by Bennedsen, Pérez-González, and Wolfenzon (2020) who exploit hospitalizations to examine variation in firms' exposures to their CEOs. Similarly, a vibrant literature suggests that managers' personal traits play a role in shaping their management approach (e.g., Malmendier and Tate 2005; Kaplan, Klebanov, and Sorensen 2012; Graham, Harvey, and Puri 2013; Benmelech

[1] See, for example, Beaver, Kettler, and Scholes (1970), Hamada (1972), Breen and Lerner (1973), Rosenberg and McKibben (1973), Fisher (1974), Lev and Kunitzky (1974), Melicher (1974), Robichek and Cohn (1974), Ben-Zion and Shalit (1975), and Karolyi (1992).

[2] Ben-Zion and Shalit (1975) conclude that "a search for the 'missing variable' seems to be a worthwhile undertaking for future research, not only because an important determinant of risk might thus be identified, but also because in the process we may gain a better understanding of the different aspects of risk" (p. 1025).

and Frydman 2015).[3] Prior research, however, often assumes that managerial style mostly affects firms' exposures to idiosyncratic risk rather than systematic risk. For example, Bushman, Dai, and Wang (2010) "posit that idiosyncratic volatility reflects information arrival related to the impact of CEO talent on firm performance, while systematic volatility captures aspects of return volatility unrelated to CEO talent and beyond the CEO's control" (p. 382). Our results suggest that managerial style explains a substantial fraction of the variation in both idiosyncratic risk and systematic risk.[4]

Our argument that managers matter to a firm's exposure to systematic risk is a building block in many models where managers make investment decisions. For example, Berk, Green, and Naik (1999) model a firm as a portfolio of projects that differ in their risk exposures. At each point in time, managers of the firm can decide to take on new projects and close down existing ones. While these project-level choices made by managers are difficult to measure or quantify, we do observe the firm's aggregated systematic risk, which is a weighted average of the risk exposures of all projects undertaken by the firm at a given point in time. Within this model, managers can significantly alter a firm's asset portfolio and thus its risk exposure as new investment opportunities with varying risk characteristics arrive and existing projects wind down.[5] We argue that managers make these project-level choices based not only on economic incentives and accessible information, but also on their individual preferences, risk-aversion, ability, knowledge,

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[3] In addition, recent research documents that individuals exhibit large differences in their expectations about future macroeconomic conditions, which influences their desire to invest in the stock market and purchase durable goods (e.g., Kuhnen and Miu 2017; Das, Kuhnen, and Nagel 2020).

[4] A strand of research suggests that managers' incentives shape their risk-taking behavior (see Section 2 for details). However, this literature does not focus on individual differences of managers. Instead, this literature assumes that different managers will make similar decisions when provided with the same incentives.

[5] Butler, Cornaggia, Grullon, and Weston (2011) provide evidence supporting that market prices respond efficiently to changes in risk when firms raise capital and undertake investment projects.

experiences, and other idiosyncrasies. Hence, the individual differences of managers can potentially explain a firm's exposure to systematic risk.

Starting from a single-factor market model, we decompose stock return variability into systematic and idiosyncratic components. Total risk (*TVOL*) is the standard deviation of a firm's daily stock returns within its fiscal year. We estimate the market model using a one-year window with daily returns. Our measure of systematic risk (β_{MKT}) is the slope coefficient on the excess return of the market portfolio and our measure of idiosyncratic risk (*IVOL*) is the standard deviation of the residuals. Although we focus on the single-index model, our results generalize to other empirical asset pricing models such as the Fama-French Six-Factor Model.[6]

Following Bertrand and Schoar (2003), we track the movement of managers across firms over time to disentangle manager fixed effects from firm fixed effects. We cannot separate manager fixed effects from firm fixed effects if, for example, a manager never switches firms and advances only through internal promotions. In our base model, we regress each measure of risk on firm fixed effects and year fixed effects. Then, we add manager fixed effects to our base model and examine whether the manager fixed effects have incremental explanatory power.[7] Intuitively, we test whether systematic risk is correlated across at least two firms when the same manager is present, controlling for time-invariant firm characteristics (firm fixed effects) and year-specific cross-sectional effects (year fixed effects).

[6] We focus on market beta due to its strong theoretical roots (Sharpe 1964; Lintner 1965) and its widespread use in practice. Berk and van Binsbergen (2016) find that the Capital Asset Pricing Model (CAPM) is the dominant model used by mutual fund investors to make their capital allocation decisions. In addition, Graham and Harvey (2001) report that more than 70% of CFOs use the CAPM to calculate their cost of equity. Dessaint, Olivier, Otto, and Thesmar (2021) provide systematic evidence on the real effects of using the CAPM in capital budgeting.

[7] This approach does not rule out that managers may develop their style over time or that the market may learn about a manager's style over her tenure (e.g., Pan, Wang, and Weisbach 2015). Manager fixed effects do not capture such a time-varying dimension of style.

Our results indicate that managerial style is an important determinant of systematic risk. We observe a 7.16% increase in adjusted R^2 when we add manager fixed effects to the model with β_{MKT} as the dependent variable, which translates to a 16.67% increase relative to the base model. For comparison, we observe a 4.43% increase in adjusted R^2 when we use $IVOL$ as the dependent variable and we observe a 4.56% increase in adjusted R^2 when we use $TVOL$ as the dependent variable. Adjusted R^2 increases by 7.19% and 7.36% relative to the base model for $IVOL$ and $TVOL$, respectively. Furthermore, the frequency of significant manager fixed effects is far greater than would be expected under the null hypothesis that managerial style is not a determinant of systematic risk: 49.26% of the manager fixed effects are significant at the 10% level, 43.18% of the manager fixed effects are significant at the 5% level, and 35.01% of the manager fixed effects are significant at the 1% level. In terms of economic magnitude, hiring a manager at the 25th percentile leads to a 0.201 decrease in β_{MKT} and hiring a manager at the 75th percentile leads to a 0.161 increase in β_{MKT}.

In addition, we confirm the above results with a more parametric specification by tracking the evolution of β_{MKT} in event-time surrounding executive transitions. When a firm hires a manager with a beta-increasing style, we observe an immediate and persistent increase in β_{MKT}. In contrast, when a firm hires a manager with a beta-decreasing style, we observe an immediate and persistent decrease in β_{MKT}.

To understand the channels through which top managers affect systematic risk, we analyze whether specific firm-level decisions that managers undertake translate into differential loadings on systematic risk. We first examine whether manager fixed effects on the real side of the firm, such as capital structure decisions and other firm policies, explain manager fixed effects on beta, β_{MKT}. Bertrand and Schoar (2003) show that manager fixed effects are important for a number of corporate policy variables. We conduct factor analysis which shows that these manager fixed effects vary along three dimensions: internal growth, financial conservatism, and external growth. Manager fixed effects on β_{MKT} are positively related to managers' preferences for internal growth and negatively related to managers' preferences for financial conservatism, but do not vary systematically with measures of external growth.[8]

To analyze the importance of managerial strategies in explaining manager fixed effects on β_{MKT}, we also rerun our regressions, but directly control for time-varying firm characteristics. This specification directly absorbs changes on the real side of the firm that top managers might be undertaking. When we control for time-varying firm characteristics, adjusted R^2 increases by 6.86% (compared to 7.16% in the benchmark specification). Our results indicate that time-varying firm characteristics partially explain manager fixed effects on β_{MKT}, However, manager fixed effects have significant explanatory power after controlling for time-varying firm characteristics. The above results suggest that managers affect their firm's loading on systematic risk via the project-level choices that they make, and a large amount of the variation in manager fixed effects on β_{MKT} are not captured in traditional corporate policy variables.

Similarly, by using unlevered betas (i.e. asset betas) we separate out the effect of the firm's capital structure and isolate the component of systematic risk due to the firm's assets. Adjusted R^2 increases by 6.06%, which translates to a 13.98% increase relative to the base model. Our results indicate that manager fixed effects are an important determinant of unlevered beta, which confirms that managers influence the risk of their firm's underlying assets and not only the capital structure of their firm.

[8] A caveat is that these documented relations are not necessarily causal.

In a next step, we analyze whether observable manager characteristics explain manager fixed effects with respect to systematic risk. We find that manager fixed effects on β_{MKT} are related to managers' early-career experiences. On average, the signed effect on β_{MKT} is 0.240 smaller for managers who originally entered the labor market during recessions. These results are in line with the findings in Schoar and Zuo (2017) that managers who enter the labor market during recessions adopt more conservative corporate strategies, such as lower SG&A or reduced leverage. We do not find evidence that other characteristics like age or gender are related to manager fixed effects on β_{MKT}.

To shed light on the settings in which managerial style matters more for systematic risk, we analyze whether certain firm and market conditions moderate the effect of managers on beta. We find that manager fixed effects on β_{MKT} are more pronounced in smaller firms compared to larger firms, which is consistent with the notion that managers have more discretion over firm outcomes in smaller firms.

Two things are worth noting in interpreting our results. First, the documented managerial effects on a firm's systematic risk are not the causal effects of randomly assigning managers to firms. A manager's preferred level of systematic risk may be (at least partially) observable to the board before she is appointed. Therefore, a firm with a need for a certain level and type of risk exposure may seek a manager whose style fits its vision. For example, boards might prefer to hire beta-increasing managers when they expect a bull market and vice versa for beta-decreasing managers in a bear market. While we do not find evidence of such hiring patterns based on observables, we cannot rule out that endogenous matching of firms and managers may partly explain our results. Second, our sample focuses on managers who work in two or more firms, i.e., movers. It could be the case that managers who tend to have strong beta styles are those who tend to move. Hence, we caution that our results may not generalize to managers who never switch firms.

The rest of our paper is organized as follows. Section 2 reviews the related literature and discusses our paper's contributions. Section 3 describes our sample. Section 4 describes our measures of risk and presents descriptive statistics. Section 5 presents the main results. Section 6 summarizes and offers some concluding remarks.

2 Related Literature and Contributions

One of the key insights of asset pricing theory is that investors are rewarded for bearing systematic risk, but not idiosyncratic risk. To shed light on the sources of systematic risk, a large literature studies the fundamental determinants of beta. Early empirical work identified several firm-, industry-, and market-level determinants.[9] More recently, a strand of the literature models beta as a function of firm characteristics, including size, book-to-market, and financial leverage. For example, Gomes, Kogan, and Zhang (2003) model a dynamic general equilibrium production economy that links beta with firm size and book-to-market. Size captures the importance of growth options relative to assets-in-place. Small firms derive most of their value from growth options, while large firms derive most of their value from assets-in-place. Since growth options are riskier than assets-in-place, small firms have higher beta. On the other hand, book-to-market is a measure of the risk associated with a firm's assets-in-place, leading to a positive relation between beta and book-to-market. Carlson, Fisher, and Giammarino (2004) elaborate on the mechanism underlying this relation. High book-to-market firms have higher operating leverage (i.e., more fixed costs), which increases their sensitivity to aggregate demand shocks. Livdan, Sapriza, and Zhang (2009)

[9] See, for example, Beaver, Kettler, and Scholes (1970), Hamada (1972), Breen and Lerner (1973), Rosenberg and McKibben (1973), Fisher (1974), Lev and Kunitzky (1974), Melicher (1974), Robichek and Cohn (1974), Ben-Zion and Shalit (1975), and Karolyi (1992).

study the relation between beta and financial leverage. Levered firms are riskier because financial constraints hinder their ability to adjust capital investments in response to aggregate demand shocks. We contribute to this literature by identifying managerial style as a novel determinant of beta. Our paper differs from prior research in that we examine manager-specific differences rather than firm, industry, or market characteristics.

A growing body of research suggests that CEOs and other top executives exhibit large person-specific differences in their management styles (see reviews in Malmendier (2018) and Hanlon, Yeung, and Zuo (2021)). Bertrand and Schoar (2003) document that such person-specific styles explain a large fraction of the variation in firms' investment, financial, and organizational policies. In a similar vein, other studies have documented the importance of managerial style for tax avoidance (Dyreng, Hanlon, and Maydew 2010), voluntary disclosure (Bamber, Jiang, and Wang 2010), and financial reporting (Ge, Matsumoto, and Zhang 2011). Recently, Bennedsen, Pérez-González, and Wolfenzon (2020) show that CEOs have significant effects on investment and profitability using hospitalizations as an exogenous source of variation in firms' exposures to their CEOs. A related strand of literature suggests that managers' styles are shaped by their personal traits including overconfidence (Malmendier and Tate 2005, 2008; Hirshleifer, Low, and Teoh 2012), political connection (Fan, Wong, and Zhang 2007), skills and expertise (Kaplan, Klebanov, and Sorensen 2012; Custódio and Metzger 2013, 2014), military service (Benmelech and Frydman 2015), marriage (Roussanov and Savor 2014), parenting a daughter (Cronqvist and Yu 2017), and formative experiences during childhood (Malmendier, Tate, and Yan 2011; Bernile, Bhagwat, and Rau 2016) and the beginning of a manager's career (Dittmar and Duchin 2015; Schoar and Zuo 2016, 2017).[10] While a growing body of research documents the effects of

[10]A large body of work in the strategic management literature argues that managers' unique experiences, values, and personalities influence how they respond to complex situations, see Hambrick and Mason (1984) or Hambrick (2007).

individual managers in accounting and corporate finance, the asset pricing implications of managerial style have remained unexplored. We fill this gap by documenting the importance of managerial style for firms' systematic risk exposures.

Several papers have pointed out that a CEO's compensation can influence her willingness to take risk. In particular, option contracts can shape managerial risk-taking (e.g., Hall and Murphy 2003; Coles, Daniel, and Naveen 2006; Lewellen 2006; Armstrong and Vashishtha 2012; Hayes, Lemmon, and Qiu 2012; Shue and Townsend 2017; Kubick, Robinson, and Starks 2018). Since options have convex payoffs, they create incentives for managers to take risk. But options also increase the sensitivity of a manager's wealth to her firm's stock price, which can lead a risk-averse manager to reduce firm risk. In addition, research suggests that observed compensation arrangements can arise as either the solution to an optimal contracting problem or the outcome of a governance problem where managers are paid for luck (Bertrand and Mullainathan 2001; Gormley, Matsa, and Milbourn 2013). Gopalan, Milbourn, and Song (2010) highlight the potential for CEO compensation to affect firm loadings on systematic risk. They propose that the optimal contract needs to provide incentives for managers to forecast sector movements and to choose a strategy that yields the optimal exposure to such movements. We view our paper as complementary to this literature. While existing work in the compensation literature views managers as *homo economicus* (an economic being) and highlights the role of firm-level mechanisms in shaping managers' risk-taking incentives, we view managers as *homo sapiens* (a human being) and focus on managers' person-specific styles that are orthogonal to firm-level factors.

First, a manager's field of vision is limited and they might therefore operate with specific heuristics. Second, the information selected for processing is interpreted through a filter woven by the manager's cognitive frame.

3 Sample

Our sample begins with all executives covered by Execucomp between 1992 and 2016. Within the Execucomp universe, we identify managers who work in two or more firms ("movers").[11] In doing so, we require that movers work at least three years in each firm, giving these managers an opportunity to "imprint their mark."[12] If a firm employs a mover at any point during our sample period, we retain all of that firm's observations. Lastly, our sample excludes financial firms (SIC = 6) and utilities (SIC = 49).[13] The resulting sample includes 25,266 firm-year observations corresponding to 1,675 firms and 1,683 movers.[14]

Table 1 summarizes the nature of executive transitions in our sample. We use three variables in Execucomp to code the position of a specific manager in a given firm: (1) *titleann*, (2) *ceoann*, and (3) *cfoann*. Following the prior literature (e.g., Jiang, Petroni, and Wang 2010), we use *ceoann* to identify CEOs.[15] For the sample period after and including 2006, we use *cfoann* to identify CFOs. For the sample period before 2006, we code a manager as CFO if *titleann* includes any of the following phrases: CFO, Chief Financial Officer, Treasurer, Controller, or Finance.[16]

A small subset of managers work at more than two firms: 131 (7.78%) managers work at three firms, 14 (0.83%) managers work at four firms, and 3 (0.18%) managers work at five firms.

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[11] Beginning in 1994, Execucomp has tracked the top five highest paid executives in the S&P 1500. Execucomp includes both incumbent firms as well as firms that were once part of the S&P 1500, but were later removed from the index. Before 1994, Execucomp's coverage was limited to the S&P 500. Our sample selection procedure excludes managers who move from an Execucomp firm to a non-Execucomp firm and vice versa. However, we do not believe that this sample selection issue limits the generalizability of our results since the S&P 1500 covers approximately 90% of the U.S. market capitalization.

[12] Our inferences remain largely unchanged when we do not impose this restriction.

[13] Our results are qualitatively similar if we include these firms.

[14] Because the dependent variable is firm-specific rather than manager-specific, we do not include non-movers in the estimation. As noted in Graham, Li, and Qiu (2012), an alternative approach based on Abowd, Kramarz, and Margolis (1999) can be used to include non-movers and increase the precision of the model estimates when the dependent variable is manager-specific (e.g., executive compensation).

[15] When a firm-year is not assigned a CEO (i.e., *ceoann* is missing), we assign a CEO using the variables *becameceo* and *leftofc*, if possible.

[16] The variables *ceoann* and *titleann* are available for the entire sample period; *cfoann* is not available before 2006.

When a manager works at three or more firms (i.e., moves more than once), Table 1 reports the last move only. Therefore, the "to" positions in Table 1 can be interpreted as the last position held by each manager. Our sample contains 582 executives whose last position is CEO, 414 executives whose last position is CFO, and 687 executives whose last position is neither CEO nor CFO (i.e., Other). "Other" refers to miscellaneous job titles, such as Chief Operating Officer, Corporate Secretary, General Counsel, and various subdivision Presidents or Vice-Presidents (e.g., human resources, research and development, and marketing). In our main analysis, we use these three categories to group manager fixed effects. Our analysis includes the top-five executives instead of only the CEOs and CFOs because the management literature has long noted that organizational outcomes are shaped by the entire top management team (e.g., Hambrick and Mason 1984; Finkelstein, Hambrick and Cannella 2009).

Our sample contains 214 executives who leave a CEO position, 440 executives who leave a CFO position, and 1,029 executives who leave a non-CEO, non-CFO position. Among the set of executives who start as CEO, 132 become CEO at another firm and 82 move to a non-CEO, non-CFO position at another firm. Among the set of executives who start as CFO, 41 become CEO at another firm, 340 become CFO at another firm, and 59 move to a non-CEO, non-CFO position at another firm. Lastly, among the set of executives who start in a non-CEO, non-CFO position, 409 become CEO at another firm, 74 become CFO at another firm, and 546 move to a non-CEO, non-CFO position at another firm.

We merge the firm-year panel described above with annual accounting variables from Compustat, merger and acquisition data from SDC Platinum, institutional holdings data from

CDA/Spectrum, and volatilities calculated using daily stock returns from the Center for Research in Security Prices (CRSP) and daily factor returns from Kenneth French's data library.[17]

4 Variable Definitions and Descriptive Statistics

4.1 Risk

The Capital Asset Pricing Model (CAPM) proposed by Sharpe (1964) and Lintner (1965) formalizes the relation between risk and expected returns. Specifically, the Sharpe-Lintner CAPM shows that if investors have homogenous expectations and hold mean-variance efficient portfolios (Markowitz 1959), then the market portfolio will itself be a mean-variance efficient portfolio. The efficiency of the market portfolio leads to the following equilibrium pricing relation:

$$E[R_i] = R_f + \beta_{im}\left(E[R_m] - R_f\right) \tag{1}$$

$$\beta_{im} = \frac{Cov(R_i, R_m)}{Var(R_m)}$$

where R_i is the return of asset *i*; R_f is the return of the risk-free asset; and R_m is the return of the market portfolio. The beta coefficient, β_{im}, measures the sensitivity of the return of asset *i* to that of the market portfolio and has been widely adopted as a measure of systematic risk in security and portfolio analysis.

The Sharpe-Lintner CAPM is a one-period model. Thus, early studies often assumed that beta was time-invariant. However, empirical evidence challenges the veracity of this assumption (e.g., Bollerslev, Engle, and Wooldridge 1988; Harvey 1989; Jagannathan and Wang 1996). These studies advocate a dynamic or conditional CAPM in which beta is time-varying and depends on investors' information set at any given point in time.[18] Several recent studies estimate beta using

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[17] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[18] Liu, Stambaugh, and Yuan (2018) note: "[t]here are numerous approaches for estimating [time-varying] betas on individual stocks, and the literature does not really offer a consensus" (p. 3).

a one-year window with daily returns (e.g., Lewellen and Nagel 2006; Cederburg and O'Doherty 2016; Herskovic, Kelly, Lustig, and Van Nieuwerburgh 2016; Hong and Sraer 2016). Following these studies, we estimate the following time-series regression for each firm-year.[19]

$$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}\left(R_{mt\tau} - R_{ft\tau}\right) + \varepsilon_{it\tau} \tag{2}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ; $R_{ft\tau}$ is the risk-free rate on day *t* in year τ; and $R_{mt\tau}$ is the return of the market portfolio on day t in year τ. Our measure of systematic risk, β_{MKT}, is the slope coefficient on the excess return of the market portfolio. While systematic risk is the focus of our study, we also examine total risk and idiosyncratic risk. Total risk (*TVOL*) is the standard deviation of a firm's daily stock returns within its fiscal year and idiosyncratic risk ($IVOL$) is the standard deviation of the residuals $\varepsilon_{it\tau}$. Following Bali, Engle, and Murray (2016), we require at least 200 daily observations in year τ to estimate our measures of risk.[20]

4.2 Descriptive Statistics

Table 2 reports descriptive statistics for our measures of risk as well as the corporate policy variables and measures of firm performance studied in Bertrand and Schoar (2003). All variables are defined in Appendix 1. We winsorize all continuous variables at the 1st and 99th percentiles to reduce the influence of outliers. The mean (median) β_{MKT} in our sample is 1.082 (1.021). Although our sample focuses on the S&P 1500, we still observe considerable variation in firms' systematic risk exposures. The standard deviation of β_{MKT} is 0.521 and the interquartile range of β_{MKT} is 0.644.

[19] Equation (2) allows a firm's risk exposures to change annually but assumes that a firm's risk exposures are stable within its fiscal year.

[20] To ensure that microstructure frictions such as bid-ask bounce do not confound our results, we repeat our analysis for each measure of risk using weekly returns in lieu of daily returns. We require at least 26 weekly observations in year τ to estimate our measures of risk. Our results are qualitatively similar when we use these measures of risk.

5 Main Results

5.1 Executive Fixed Effects on Risk

To test whether managerial style is an important determinant of systematic risk, we adopt Bertrand and Schoar's (2003) identification strategy. First, we regress each measure of risk on firm fixed effects (γ_i) and year fixed effects (α_t). Firm fixed effects control for time-invariant firm characteristics. Year fixed effects control for cross-sectional changes in risk such as those documented by Campbell, Lettau, Malkiel, and Xu (2001). Then, we add manager fixed effects to our base model and examine whether the manager fixed effects have incremental explanatory power. Using the "to" positions in Table 1, we create three groups of manager fixed effects: λ_{CEO} are fixed effects for managers who are CEO in the last position we observe them in, λ_{CFO} are fixed effects for managers who are CFO in the last position we observe them in, and λ_{Other} are fixed effects for managers who are neither CEO nor CFO in the last position we observe them in. The manager fixed effects are indicator variables that equal one if manager *j* works at firm *i* during fiscal year τ. For each measure of risk, we estimate three models:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \varepsilon_{i\tau} \tag{3}$$

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \varepsilon_{i\tau} \tag{4}$$

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau} \tag{5}$$

Note that none of these models include time-varying firm characteristics (e.g., leverage). Suppose that differences between managers lead to differences in their firms' capital structure, which affects systematic risk. If we controlled for leverage, we would ignore this effect. The goal of our first test is to quantify the *total* effect of managers on systematic risk, so we exclude time-varying firm controls.[21] When we look at the mechanisms through which managers affect systematic risk, we include time-varying firm controls and examine the extent to which these controls explain manager fixed effects on systematic risk.

Table 3 reports the results from estimating equations (3), (4), and (5) using the sample of firm-years with non-missing data. For each measure of risk, the first row reports the adjusted R^2 of our base model that includes only firm fixed effects and year fixed effects. The second row reports adjusted R^2 when we include CEO fixed effects and the third row reports adjusted R^2 when we include fixed effects for all three groups of managers. The second and third rows also report F-statistics, which test the joint significance of the manager fixed effects.[22]

The adjusted R^2 of our base model is 42.94% for β_{MKT}. Adding CEO fixed effects to our base model increases adjusted R^2 to 45.60% and adding manager fixed effects for all three groups of managers increases adjusted R^2 to 50.10%.[23] Overall, adjusted R^2 increases by 7.16%, which translates to a 16.67% (7.16/42.94) increase relative to the base model. For comparison, we observe a 4.43% increase in adjusted R^2 when we use $IVOL$ as the dependent variable and we observe a 4.56% increase in adjusted R^2 when we use $TVOL$ as the dependent variable. Adjusted R^2 increases by 7.19% (4.43/61.62) and 7.36% (4.56/61.99) relative to the base model for $IVOL$

[21] As Angrist and Pischke (2008) note, "[s]ome variables are bad controls and should not be included in a regression model... Bad controls are variables that are themselves outcome variables" (p. 64).
[22] We use robust standard errors when we test the joint significance of the manager fixed effects. With clustered standard errors, the degree of freedom of our model is the minimum of the number of regressors and the number of clusters minus 1 (Cameron and Miller 2015). Since the number of clusters exceeds the number of regressors, the degree of freedom is the number of regressors. It is not possible to test the joint significance of the manager fixed effects using clustered standard errors because the number of linear restrictions exceeds the degree of freedom. It is, however, possible to consistently estimate the individual manager fixed effects using clustered standard errors, which we report in Figure 1.
[23] The evidence on non-CEO executive fixed effects are consistent with the view in the management literature that it is the entire TMT rather than the CEO alone that determines organizational outcomes (Finkelstein 1992; Ke, Mao, Wang, and Zuo 2021).

and $TVOL$, respectively. In all specifications, the F-test strongly rejects the null hypothesis that the manager fixed effects are jointly equal to zero ($p < 0.0001$).

The incremental adjusted R^2s reported in Table 3 are comparable in magnitude to those in prior studies. Bertrand and Schoar (2003) report large increases in adjusted R^2 for SG&A (37%), number of diversifying acquisitions (11%), and interest coverage (10%). However, Bertrand and Schoar (2003) report small increases in adjusted R^2 for other variables such as investment to cash flow sensitivity (1%), leverage (2%), and cash holdings (3%). More recently, Dyreng, Hanlon, and Maydew (2010) examine manager fixed effects for tax avoidance. Their adjusted R^2 increases by 6.4% when manager fixed effects and year fixed effects are added to their base model, which includes only firm fixed effects. Ge, Matsumoto, and Zhang (2011) examine manager fixed effects for several financial reporting variables: discretionary accruals, off-balance sheet accounting, pension accounting, meeting and beating analysts' expectations, earnings smoothing, and the likelihood of misstatements. Their average incremental adjusted R^2 is 2%.

5.2 Robustness Tests

5.2.1 Infrequent Trading

When a stock is infrequently traded, estimates of systematic risk using equation (2) may be biased (Dimson 1979). This concern is unlikely to confound our results since Execucomp tracks firms in the S&P 1500 and we use a relatively recent sample period (1992 to 2016). Nevertheless, we ensure the robustness of our results using Dimson's (1979) procedure: that is, we include current and lagged market returns in equation (2), estimating $\beta_{MKT,DIMSON}$ as the sum of the slopes on all lags. Following Lewellen and Nagel (2006), we include four lags of market returns, but we do not impose the constraint that lags two to four have the same slope. More specifically, we estimate the following time-series regression for each firm-year.

$$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}^{0}\left(R_{mt\tau} - R_{ft\tau}\right) + \sum_{k=1}^{4} \beta_{i\tau}^{k}\left(R_{m,t-k,\tau} - R_{f,t-k,\tau}\right) + \varepsilon_{it\tau} \tag{6}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ; $R_{ft\tau}$ is the risk-free rate on day *t* in year τ; and $R_{mt\tau}$ is the return of the market portfolio on day *t* in year τ. $\beta_{MKT,DIMSON}$ is the slope coefficient on the excess return to the market ($\beta_{i\tau}^{0}$) plus all of the slope coefficients on the lagged excess returns to the market ($\beta_{i\tau}^{1} + \beta_{i\tau}^{2} + \beta_{i\tau}^{3} + \beta_{i\tau}^{4}$). $IVOL_{DIMSON}$ is the standard deviation of the residuals $\varepsilon_{it\tau}$.

Table 4 reports the results from estimating equations (3), (4), and (5) for $\beta_{MKT,DIMSON}$ and $IVOL_{DIMSON}$. When we include fixed effects for all three groups of managers, we observe a 4.69% increase in adjusted R^2 for $\beta_{MKT,DIMSON}$ and a 4.44% increase in adjusted R^2 for $IVOL_{DIMSON}$. Relative to the base model, adjusted R^2 increases by 14.44% (4.69/32.47) for $\beta_{MKT,DIMSON}$ and 7.20% (4.44/61.65) for $IVOL_{DIMSON}$.

5.2.2 Fama-French Six-Factor Model

Drawing on Merton's (1973) Intertemporal Capital Asset Pricing Model (ICAPM) and Ross' (1976) Arbitrage Pricing Theory (APT), several multifactor models have been proposed (e.g., Fama and French 1993, 2015, 2018). In this section, we examine whether our results generalize to the Fama-French Six-Factor Model – one of the most recently adopted models in the asset pricing literature. We begin by estimating asset-specific factor loadings using the following time-series regression for each firm-year:

$$\begin{aligned} R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} &+ \beta_{i\tau}^{MKT} MKT_{t\tau} + \beta_{i\tau}^{SMB} SMB_{t\tau} + \beta_{i\tau}^{HML} HML_{t\tau} \\ &+ \beta_{i\tau}^{RMW} RMW_{t\tau} + \beta_{i\tau}^{CMA} CMA_{t\tau} + \beta_{i\tau}^{UMD} UMD_{t\tau} \\ &+ \varepsilon_{it\tau} \end{aligned} \tag{7}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ; $R_{ft\tau}$ is the risk-free rate on day *t* in year τ; $MKT_{t\tau}$ is the excess return of the market portfolio; $SMB_{t\tau}$ is the return to a diversified portfolio that is long in small (low market capitalization) firms and short in big (high market capitalization) firms;

$HML_{t\tau}$ is the return to a diversified portfolio that is long in high book-to-market (value) firms and short in low book-to-market (growth) firms; $RMW_{t\tau}$ is the return to a diversified portfolio that is long in firms that have robust (high) operating profitability and short in firms that have weak (low) operating profitability; $CMA_{t\tau}$ is the return to a diversified portfolio that is long in firms that have conservative (low) investment and short in firms that have aggressive (high) investment; and $UMD_{t\tau}$ is the return to a diversified portfolio that is long in firms that performed well during the previous 12 months and short in firms that performed poorly during the previous 12 months. The slope coefficients ($\beta_{i\tau}^{MKT}$, $\beta_{i\tau}^{SMB}$, $\beta_{i\tau}^{HML}$, $\beta_{i\tau}^{RMW}$, $\beta_{i\tau}^{CMA}$, and $\beta_{i\tau}^{UMD}$) are asset-specific sensitivities to the six factors of Fama and French (2018). We use $IVOL_{FF6}$ to denote the standard deviation of the residuals $\varepsilon_{it\tau}$.

Table 5 reports the results from estimating equations (3), (4), and (5) for the Fama-French (2018) factor loadings and $IVOL_{FF6}$. Adjusted R^2 increases by 3.03%, 2.58%, 2.09%, 2.05%, 5.10%, and 3.11% for $\beta_{MKT,FF6}$, $\beta_{SMB,FF6}$, $\beta_{HML,FF6}$, $\beta_{RMW,FF6}$, $\beta_{CMA,FF6}$, and $\beta_{UMD,FF6}$, respectively. This translates to a 14.57% (3.03/20.80), 6.15% (2.58/41.96), 9.02% (2.09/23.17), 8.76% (2.05/23.41), 41.13% (5.10/12.44), and 53.07% (3.11/5.876) increase in adjusted R^2 relative to each factor loading's base model. For comparison, we observe a 4.44% increase in adjusted R^2 when we use $IVOL_{FF6}$ as the dependent variable, which translates to a 7.22% (4.44/61.49) increase relative to the base model. While manager fixed effects improve the explanatory power for all of the Fama-French (2018) factor loadings, our results are most pronounced for the CMA investment factor.

Note that there is a fundamental difference between characteristics and factor loadings (Daniel and Titman 1997; Fama and French 2020). There is a mechanical relation between characteristics and factor loadings at the portfolio level, but such a relation need not exist at the firm level. Consider market capitalization and SMB. The loading on SMB must be higher for small firms than for big firms, *on average*. However, a large firm can have a large loading on SMB and a small firm can have a small loading on SMB. For example, a small firm that sells most of its products to Apple may move more closely with the prices of large firms than with the prices of other small firms. Our analysis explores whether a small firm moves more closely with the prices of large firms when a small firm employs a manager who has a "large-firm" management style.

5.2.3 Frequency of Significant Executive Fixed Effects

The alternative hypothesis of the F-tests performed in Table 3, Table 4, and Table 5 is that at least one of the manager fixed effects is not zero. Thus, a valid concern is that rejecting the null hypothesis does not necessarily mean that an economically significant number of manager fixed effects are different from zero.[24] To address this concern, Figure 1 reports the actual and expected number of significant manager fixed effects (*t*-statistics). Because systematic risk is the focus of our study, we report the number of significant manager fixed effects only for β_{MKT}, $\beta_{MKT,DIMSON}$, $\beta_{MKT,FF6}$, $\beta_{SMB,FF6}$, $\beta_{HML,FF6}$, $\beta_{RMW,FF6}$, $\beta_{CMA,FF6}$, and $\beta_{UMD,FF6}$. The number of significant manager fixed effects is qualitatively similar for the other measures of risk.

Under the null hypothesis that managerial style is not a determinant of systematic risk, we would expect 16 (i.e., 1628×0.01) manager fixed effects to be significant at the 1% level, 81 (i.e., 1628×0.05) manager fixed effects to be significant at the 5% level, and 163 (i.e., 1628×0.10) manager fixed effects to be significant at the 10% level. When we use β_{MKT} as the dependent variable, 570 manager fixed effects are significant at the 1% level, 703 manager fixed effects are significant at the 5% level, and 802 manager fixed effects are significant at the 10% level. When we use $\beta_{MKT,DIMSON}$ as the dependent variable, 549 manager fixed effects are significant at the 1%

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[24] Fee, Hadlock, and Pierce (2013) highlight this limitation of the *F*-test.

level, 689 manager fixed effects are significant at the 5% level, and 788 manager fixed effects are significant at the 10% level. When we use $\beta_{MKT,FF6}$ as the dependent variable, 586 manager fixed effects are significant at the 1% level, 734 manager fixed effects are significant at the 5% level, and 820 manager fixed effects are significant at the 10% level.

When we use $\beta_{SMB,FF6}$ as the dependent variable, 558 manager fixed effects are significant at the 1% level, 711 manager fixed effects are significant at the 5% level, and 812 manager fixed effects are significant at the 10% level. When we use $\beta_{HML,FF6}$ as the dependent variable, 579 manager fixed effects are significant at the 1% level, 730 manager fixed effects are significant at the 5% level, and 823 manager fixed effects are significant at the 10% level. When we use $\beta_{RMW,FF6}$ as the dependent variable, 554 manager fixed effects are significant at the 1% level, 702 manager fixed effects are significant at the 5% level, and 792 manager fixed effects are significant at the 10% level. When we use $\beta_{CMA,FF6}$ as the dependent variable, 562 manager fixed effects are significant at the 1% level, 712 manager fixed effects are significant at the 5% level, and 802 manager fixed effects are significant at the 10% level. Lastly, when we use $\beta_{UMD,FF6}$ as the dependent variable, 582 manager fixed effects are significant at the 1% level, 702 manager fixed effects are significant at the 5% level, and 803 manager fixed effects are significant at the 10% level.

Overall, the number of significant manager fixed effects is far greater than would be expected by chance. Moreover, our results suggest that manager fixed effects on systematic risk are pervasive and are not confined to a small subset of managers.

5.3 Distribution of Executive Fixed Effects

Next, we examine the economic magnitude of the manager fixed effects. In Table 6, we report the distribution of manager fixed effects for each regression in Table 3. When we compute these statistics, we weight each manager fixed effect by the inverse of its standard error to account for estimation error. Our results suggest that manager fixed effects are economically large. Hiring an executive at the 25th percentile of the distribution is expected to reduce β_{MKT} by 0.201, while hiring an executive at the 75th percentile of the distribution is expected to increase β_{MKT} by 0.161.[25]

5.4 Event-Time Analysis of Systematic Risk

In Figure 2, we plot the evolution of β_{MKT} in event-time surrounding executive transitions. We begin by classifying managers into four groups: beta-increasing (significant at the 5% level), beta-increasing (not significant at the 5% level), beta-decreasing (significant at the 5% level), and beta-decreasing (not significant at the 5% level). These categories are based on the sign and the significance of the fixed effects estimated in Table 3. If a firm employs one of these managers, we collect β_{MKT} for the period [–2, +2], where 0 denotes the hiring year. Then, we subtract the average value of β_{MKT} measured over the interval [-2, -1] from the raw value of β_{MKT} for each firm-year. Figure 2 plots these values for the full interval [–2, +2]. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm. The evidence in Figure 2 suggests that beta-increasing (beta-decreasing) managers lead to an immediate and persistent increase (decrease) in β_{MKT}.

The relatively rapid changes in betas are consistent with two interpretations. First, new managers can quickly change a firm's strategies and asset portfolios, which are immediately reflected in stock prices. Second, firms undergoing a beta-increasing change tend to hire managers from other high-beta firms, and firms undergoing a beta-decreasing change tend to hire managers from other low-beta firms. These two possibilities likely both contribute to the observed patterns

[25] When a new CEO is hired, the average unsigned change in β_{MKT} is 0.374 (untabulated).

in Figure 2. Under either interpretation, manager-specific differences matter to a firm's exposure to systematic risk.

5.5 Mechanisms

The previous sections of our paper indicate that manager fixed effects are an important determinant of systematic risk. In this section, we explore the channels through which managers influence systematic risk.

5.5.1 Executive Fixed Effects on Corporate Policy

In our first test, we examine whether manager fixed effects on corporate policy variables explain manager fixed effects on systematic risk. To shed light on this mechanism, we examine the relation between manager fixed effects on systematic risk and the manager fixed effects studied in Bertrand and Schoar (2003). Bertrand and Schoar (2003) document significant manager fixed effects for twelve corporate policy variables. These variables are related to investment policy (capital expenditures, investment to *Q* sensitivity, investment to cash flow sensitivity, and number of acquisitions), financial policy (leverage, interest coverage, cash holdings, and dividend payout), and organizational strategy (number of diversifying acquisitions, R&D expenditures, advertising expenditures, and SG&A expenditures).[26]

Due to multicollinearity, we do not simply regress manager fixed effects on beta on the twelve manager fixed effects studied in Bertrand and Schoar (2003). Instead, we proceed in two steps. In the first step, we examine whether latent factors (i.e., unobservable management styles) explain the covariance structure among the manager fixed effects studied in Bertrand and Schoar

[26] All variables are defined in Appendix 1. To reduce skewness, we use the natural logarithm of one plus the raw value for number of acquisitions, number of diversifying acquisitions, and interest coverage. Table 6 reports the distribution of manager fixed effects for each corporate policy variable. When we compute these statistics, we weight each manager fixed effect by the inverse of its standard error to account for estimation error. For brevity, we do not report the estimation of these manager fixed effects. Please refer to Bertrand and Schoar (2003) for details on each specific regression.

(2003). In the second step, we examine whether the factors thereof explain manager fixed effects on beta.

To prepare our data for factor analysis, we follow the convention of standardizing our variables to have zero mean and unit variance. Using a Scree test (Cattell 1966), we determine that there are three factors. Panel A of Table 7 reports the factor loadings of the three factors; Panel B of Table 7 reports the eigenvalues and the proportion of variation explained by the three factors; and Panel C of Table 7 examines the relation between the three factors and manager fixed effects on beta.

The three factors identified in Table 7 have natural interpretations. The first factor loads positively on number of acquisitions and number of diversifying acquisitions. We interpret this factor as a preference for external growth. The second factor loads positively (negatively) on interest coverage (leverage). We interpret this factor as a preference for financial conservatism. The third factor loads positively on investment (i.e., capital expenditures), cash holdings and R&D. We interpret this factor as a preference for internal growth.

In Panel C of Table 7, we examine the relation between the three factors and manager fixed effects on beta. To ensure that these relations are not driven by managerial ability on performance, we control for manager fixed effects on ROA.[27] Factor 1 (external growth) is not significantly related to manager fixed effects on β_{MKT}. This finding is intuitive. Managers who have a proclivity to acquire other firms can acquire either high-beta or low-beta targets. Therefore, a preference for external growth can be beta-increasing, beta-decreasing, or beta-neutral. Our results suggest that a preference for external growth is beta-neutral, on average.

[27] Our inferences are unchanged when we use manager fixed effects on operating return on assets to measure performance effects instead.

There is some evidence that Factor 2 (financial conservatism) is related to manager fixed effects on β_{MKT}. The coefficient on Factor 2 is statistically significant at the 10% level and economically large. The interquartile range for Factor 2 is 0.895 (untabulated), so we would expect the effect of a manager on β_{MKT} to be 0.062 smaller (i.e., 0.895×0.069) for a manager at the 75th percentile of Factor 2 relative to a manager at the 25th percentile of Factor 2, holding the other covariates constant.

On the other hand, Factor 3 (internal growth) is positively related to manager fixed effects on β_{MKT}. The coefficient on Factor 3 is statistically significant at the 1% level and economically large. The interquartile range for Factor 3 is 0.569 (untabulated), so we would expect the effect of a manager on β_{MKT} to be 0.147 larger (i.e., 0.569×0.259) for a manager at the 75th percentile of Factor 3 relative to a manager at the 25th percentile of Factor 3, holding the other covariates constant.

Manager fixed effects on ROA are not significantly related to manager fixed effects on β_{MKT}. However, manager fixed effects on ROA are negatively related to manager fixed effects on idiosyncratic risk. The coefficient on the performance effect is negative and significant at the 1% level for $IVOL$. Managers who have larger performance fixed effects are associated with lower idiosyncratic risk, suggesting that these managers have superior ability, not greater risk tolerance.[28]

Overall, Table 7 provides evidence that manager fixed effects on corporate policy variables partially explain manager fixed effects on systematic risk. Specifically, manager fixed effects on systematic risk are negatively related to managers' preferences for financial conservatism and positively related to managers' preferences for internal growth.

[28] The Pearson product-moment correlation (Spearman rank-order correlation) between manager fixed effects on β_{MKT} and manager fixed effects on $IVOL$ is 0.438 (0.450).

5.5.2 Firm-Level Determinants of Beta

In our second test, we estimate manager fixed effects after controlling for known firm-level determinants of beta. As discussed in Section 2, beta is related to firm size, book-to-market, and leverage. We adopt the standard definitions used in the prior literature (Cosemans et al. 2015). Size is the market value of equity. Book-to-market is book value of equity divided by market value of equity, where book value of equity equals common equity plus deferred taxes and investment tax credits minus the book value of preferred stock. Lastly, leverage is book value of assets divided by the market value of equity. We use the logarithmic transformation of these variables.

Without controlling for time-varying firm characteristics (Table 3), adjusted R^2 increases by 7.16% when we add manager fixed effects to the model with β_{MKT} as the dependent variable. After controlling for time-varying firm characteristics (Table 8), adjusted R^2 increases by 6.86% (51.51−44.65). This test indicates that manager fixed effects are incremental to known firm-level determinants of beta.

5.5.3 Unlevered Beta

In our third test, we estimate manager fixed effects on unlevered beta (i.e., asset beta). Unlevered beta removes the effect of the firm's capital structure and isolates the component of systematic risk due to the firm's assets, such as the different types of businesses in which the firm operates and the firm's operating leverage.

Following prior research (e.g., Choy, Lin, and Officer 2014), we estimate unlevered beta using Hamada's (1972) equation:

$$\beta_{MKT}^{U} = \frac{\beta_{MKT}}{1 + (1 - T_c)\left(\frac{D}{E}\right)} \tag{8}$$

β_{MKT}^{U} denotes unlevered beta (or asset beta), β_{MKT} denotes levered beta (or equity beta), T_c denotes the corporate tax rate, D denotes the market value of debt, and E denotes the market value of equity. We use equation (2) to estimate levered beta. Following the standard convention, we use book value of debt as a proxy for market value of debt, and we measure book value of debt and market value of equity at the beginning of the year during which levered beta is estimated. Lastly, we use the GAAP effective tax rate defined as total income tax expense divided by pre-tax book income before special items.[29]

The results of this test are reported in Table 9. The adjusted R^2 of our base model is 43.35%. Adding CEO fixed effects to our base model increases adjusted R^2 to 45.35% and adding fixed effects for all three groups of managers (CEO, CFO, and Other) increases adjusted R^2 to 49.41%. Adjusted R^2 increases by 6.06%, which translates to a 13.98% (6.06/43.35) increase relative to the base model. Overall, our results indicate that manager fixed effects are an important determinant of unlevered beta, suggesting that managers influence the risk of their firm's underlying assets. Another implication of this test is that removing the effect of leverage attenuates the explanatory power of manager fixed effects for beta (7.16% for levered beta versus 6.06% for unlevered beta), suggesting that managers also influence systematic risk through leverage.

5.6 Executive Characteristics

In Table 10, we examine whether manager fixed effects on systematic risk are related to observable manager characteristics. Specifically, we examine the economic conditions at the beginning of a manager's career, birth year, and gender.[30] Following Schoar and Zuo (2017), we

[29] Our results are robust to using simulated marginal tax rates (Graham 1996a, Graham 1996b) and the cash effective tax rate defined as cash tax paid divided by pre-tax book income before special items.

[30] Three notable events occurred during our sample period: the dotcom bubble, the Enron scandal, and the global financial crisis. Our identification strategy examines whether systematic risk is correlated across at least two firms when the same manager is present. If the events thereof induce executive transitions and affect firms' risk exposures, then these events could drive our results and our results may not generalize. This is not the case. Our results are

define *Recession* as an indicator variable that equals 1 if there is a recession in the calendar year when a manager turns 24 years old. We use the manager's birth year plus 24 as the beginning of the manager's career to avoid endogenous selection of when an individual chooses to enter the labor market. Recession years are based on the business cycle dating database of the National Bureau of Economic Research (NBER). Recession years include the trough of the business cycle and all years leading to the trough (excluding the peak of the business cycle).

Panel A of Table 10 presents descriptive statistics for the sample of managers for whom we were able to estimate manager fixed effects. The descriptive statistics are virtually identical for the Execucomp universe (untabulated). Not surprisingly, the majority of the executives in our sample are male (93.7%). 23.7% of the executives in our sample entered the labor market during a recession. The mean birth year in our sample is 1953.

In Panel B of Table 10, we find that manager fixed effects on β_{MKT} are related to managers' early-career experiences. The coefficient on *Recession* is statistically significant at the 5% level and economically large. On average, we would expect the signed effect of a manager on β_{MKT} to be 0.240 smaller if the manager entered the labor market during a recession, holding the other covariates constant. Age and gender, however, are not related to manager fixed effects on β_{MKT}. These results are surprising given that older cohorts are more risk-averse than younger cohorts and women are more risk-averse than men (e.g., Byrnes, Miller, and Schafer 1999). However, as Hambrick and Mason (1984) note, it may take "a certain kind of person to rise to the top ranks of a firm" (p. 204). Therefore, individuals who rise to the top ranks of a firm may share many similarities (e.g., risk-aversion), despite differences in age or gender. It should be noted, however, that the tests in Table 10 have low power. The dependent variables are regression coefficients,

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qualitatively similar if we exclude managers who join or leave a firm in 2000 (dotcom bubble), 2001 (Enron scandal), or 2007-2008 (global financial crisis).

which are noisy by definition. Moreover, demographic characteristics are “incomplete and imprecise proxies of executives’ cognitive frames” (Hambrick 2007, p. 335).

5.7 Executive Discretion

Next, we examine whether certain environments amplify the effects of managerial style on systematic risk. This test is inspired by Finkelstein, Hambrick, and Cannella’s (2009) influential book *Strategic Leadership*. They conclude that “considerable work is needed in understanding the determinants of [executive] discretion,” and call for “examination of how organizational and individual characteristics affect the top executive’s latitude of action” (p. 41).

In Table 11, we examine whether *unsigned* manager fixed effects on systematic risk vary with institutional holdings, firm size, return on assets, leverage, Tobin’s *Q*, and the value-weighted return to the market portfolio. All variables are defined in Appendix 1. We acknowledge that the results in this table do not establish causality and are purely exploratory. However, to alleviate some concerns about reverse causality we measure all explanatory variables in the year before each executive transition. For example, for an executive transition in year τ, we measure institutional holdings in year τ–1.

Only firm size is significantly related to unsigned manager fixed effects on β_{MKT}. The coefficient on *Size* is statistically significant at the 1% level and economically large. The interquartile range for *Size* in our sample is 2.239 (untabulated). Therefore, we would expect the unsigned effect of a manager on β_{MKT} to be 0.116 smaller (i.e., 2.239×0.052) if the manager leads a firm at the 75th percentile of the *Size* distribution relative to a firm at the 25th percentile of the *Size* distribution, holding the other covariates constant. Given that Execucomp tracks managers in the S&P 1500 and our sample selection procedure further requires that a manager work at two or more Execucomp firms, the results documented hitherto likely represent a lower bound on the effects of managerial style on systematic risk.[31]

5.8 Hiring Preferences

In Table 12, we ask whether certain firm and market characteristics lead to a preference for managers who have beta-increasing styles, and whether other firm and market characteristics lead to a preference for managers who have beta-decreasing styles. For example, if the market performed well in the previous year, do boards prefer beta-increasing managers? To this end, we examine whether *signed* manager fixed effects on systematic risk vary with institutional holdings, firm size, return on assets, leverage, Tobin's *Q*, and the value-weighted return to the market portfolio. While some of the coefficients in Table 12 are statistically significant, we do not find robust evidence that managers are matched to firms purely based on their observable style.

6 Conclusion

The objective of our paper is to show that manager-specific differences are important for understanding asset prices. While there is a growing body of research on the effects of individual managers in accounting and corporate finance, the asset pricing implications of managerial style have remained unexplored.

Tracking managers across different firms over time, we find that manager fixed effects explain a significant amount of variation in firms' exposures to systematic risk (i.e., firms' sensitivities to the market factor, and other risk factors like size, value, profitability, investment, and momentum). The impact of managerial styles on firm betas is a pervasive phenomenon and is

[31] In untabulated analysis, we also find that unsigned manager fixed effects on beta are larger in firms with high beta volatility. In particular, we perform two comparisons. First, we compare managers that worked at a high beta volatility firm with managers that never worked at a high beta volatility firm. Second, we compare managers that always worked at a high beta volatility firm with managers that did not always work at a high beta volatility firm. In both comparisons, unsigned manager fixed effects on beta are larger for the former group.

not confined to a small subset of managers. We show that manager fixed effects on corporate policy variables are one channel that partially explains manager fixed effects on systematic risk. Specifically, manager fixed effects on systematic risk are positively related to managers' preferences for internal growth and negatively related to managers' preferences for financial conservatism. Importantly, manager fixed effects are incremental to known determinants of systematic risk. We can also tie manager fixed effects on systematic risk to observable manager traits such as their personal experiences. We find that managers who enter the labor market during recessions exhibit a strong proclivity to reduce their firm's systematic risk. Finally, we show that these effects are more pronounced for smaller firms.

A limitation of the managerial style literature in general is that absent exogenous variation in executive transitions, we cannot disentangle whether (1) managers impose their styles on the firms that they lead or (2) boards hire managers who match their firm's strategic needs. For example, Finkelstein, Hambrick, and Cannella's (2009) fit-drift/shift-refit model expands on the second interpretation. They argue that the economic environment can gradually *drift* or radically *shift*, creating a mismatch between the incumbent CEO's style and the firm's strategic needs. CEO succession provides an opportunity for the board to realign the firm's leadership with its prevailing economic environment (Jenter and Lewellen 2021). Our results suggest that managerial style is relevant to asset pricing, regardless of whether managers impose their styles against the will of the board or whether boards actively seek managers with particular styles. More research along these lines could further our understanding of the implications of corporate managers for asset prices.

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APPENDIX 1

VARIABLE DEFINITIONS

Variable Name	Source	Description
$TVOL$	CRSP	Standard deviation of firm *i*'s daily stock returns during fiscal year τ.
β_{MKT} $IVOL$	CRSP, Fama-French factor data	For every firm *i*'s fiscal year τ, we estimate the following OLS regression using daily stock returns (*t* indexes days in year τ): $$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}(R_{mt\tau} - R_{ft\tau}) + \varepsilon_{it\tau}$$ β_{MKT} is the slope coefficient on the excess return to the market ($\beta_{i\tau}$). $IVOL$ is the standard deviation of the residuals $\varepsilon_{it\tau}$.
$\beta_{MKT,DIMSON}$ $IVOL_{DIMSON}$	CRSP, Fama-French factor data	For every firm *i*'s fiscal year τ, we estimate the following OLS regression using daily stock returns (*t* indexes days in year τ): $$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}^{0}(R_{mt\tau} - R_{ft\tau}) + \sum_{k=1}^{4} \beta_{i\tau}^{k}(R_{mt-k\tau} - R_{ft-k\tau}) + \varepsilon_{it\tau}$$ $\beta_{MKT,DIMSON}$ is the slope coefficient on the excess return to the market ($\beta_{i\tau}^{0}$) plus all of the slope coefficients on the lagged excess returns to the market ($\beta_{i\tau}^{1} + \beta_{i\tau}^{2} + \beta_{i\tau}^{3} + \beta_{i\tau}^{4}$). $IVOL_{DIMSON}$ is the standard deviation of the residuals $\varepsilon_{it\tau}$.
$\beta_{MKT,FF6}$ $\beta_{SMB,FF6}$ $\beta_{HML,FF6}$ $\beta_{RMW,FF6}$ $\beta_{CMA,FF6}$ $\beta_{UMD,FF6}$ $IVOL_{FF6}$	CRSP, Fama-French factor data	For every firm *i*'s fiscal year τ, we estimate the following OLS regression using daily stock returns (*t* indexes days in year τ): $$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}^{MKT} MKT_{t\tau} + \beta_{i\tau}^{SMB} SMB_{t\tau} + \beta_{i\tau}^{HML} HML_{t\tau} + \beta_{i\tau}^{RMW} RMW_{t\tau} + \beta_{i\tau}^{CMA} CMA_{t\tau} + \beta_{i\tau}^{UMD} UMD_{t\tau} + \varepsilon_{it\tau}$$ The slope coefficients ($\beta_{i\tau}^{MKT}$, $\beta_{i\tau}^{SMB}$, $\beta_{i\tau}^{HML}$, $\beta_{i\tau}^{RMW}$, $\beta_{i\tau}^{CMA}$, and $\beta_{i\tau}^{UMD}$) are asset-specific sensitivities to the six risk factors of Fama and French (2018). $IVOL_{FF6}$ is the standard deviation of the residuals $\varepsilon_{it\tau}$.

APPENDIX 1

VARIABLE DEFINITIONS

Variable Name	Source	Description
Investment	Compustat	Capital expenditures (*CAPX*) divided by net property, plant, and equipment at the beginning of the fiscal year (*PPENT*).
Tobin's *Q*	Compustat	Market value of assets divided by book value of assets (*AT*). Market value of assets equals book value of assets (*AT*) plus the market value of common equity (|*PCC_F*|×*CSHO*) less the sum of the book value of common equity and deferred taxes (*CEQ*+*TXDB*).
Cash flow	Compustat	The sum of earnings before extraordinary items and depreciation (*IB*+*DP*) divided by net property, plant, and equipment at the beginning of the fiscal year (*PPENT*).
Number of acquisitions	SDC Platinum	The total number of acquisitions in the fiscal year.
Leverage	Compustat	The sum of long-term debt and debt in current liabilities (*DLTT*+*DLC*) divided by the sum of long-term debt, debt in current liabilities, and the book value of common equity (*DLTT*+*DLC*+*CEQ*).
Interest coverage	Compustat	Earnings before depreciation, interest, and tax (*OIBDP*) divided by interest expense (*XINT*). We set interest coverage to zero for firms with negative *OIBDP* and positive *XINT*.
Cash holdings	Compustat	Cash and short-term investments (*CHE*) divided by lagged total assets (*AT*).
Dividends/earnings	Compustat	The sum of common dividends and preferred dividends (*DVC*+*DVP*) divided by earnings before depreciation, interest, and tax (*OIBDP*). We set this ratio to missing when it is negative.
Number of diversifying acquisitions	SDC Platinum	The total number of acquisitions in the fiscal year where the target's two-digit SIC differs from the acquirer's two-digit SIC.
R&D	Compustat	R&D expenditures (*XRD*) divided by lagged total assets (*AT*). Missing R&D is set to zero.

APPENDIX 1

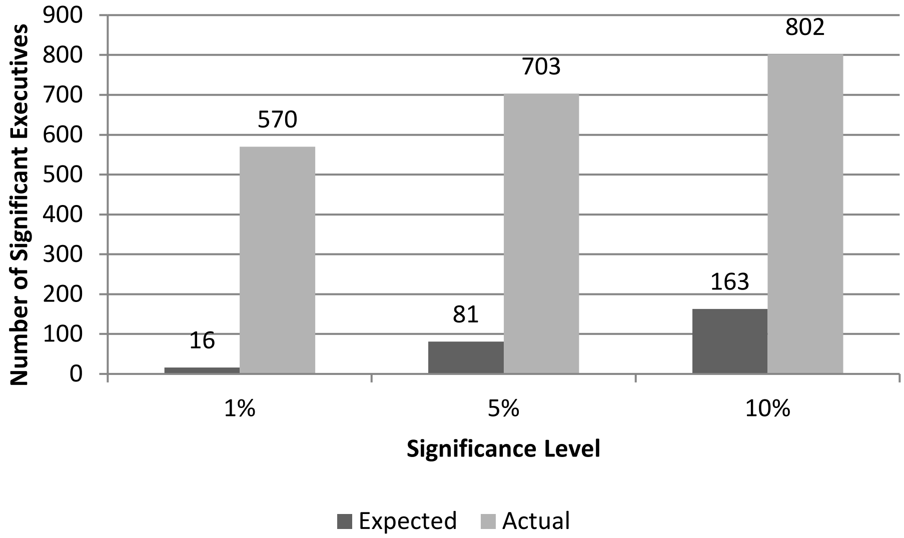
VARIABLE DEFINITIONS

Variable Name	Source	Description
Advertising	Compustat	Advertising expenditures (*XAD*) divided by lagged total assets (*AT*). Missing advertising is set to zero.
SG&A	Compustat	Selling, general, and administrative expenditures (*XSGA*) divided by sales (*SALE*). Missing SG&A is set to zero.
Return on assets	Compustat	Earnings before depreciation, interest, and tax (*OIBDP*) divided by lagged total assets (*AT*).
Operating return on assets	Compustat	Operating cash flow (*OANCF*) divided by lagged total assets (*AT*).
Institutional holdings	CDA/Spectrum	Institutional holdings divided by the number of shares outstanding.
Size	Compustat	The natural logarithm of total assets (*AT*).
Value-weighted market return	CRSP	Value-weighted return to the market (*VWRETD*) cumulated over the past 12 months.
Male	Execucomp	An indicator variable that equals one if a manager is male.
Birth year	Execucomp	A manager's birth year.
Recession	Execucomp	An indicator variable that equals one if a manager's birth year plus 24 is a recession year (Schoar and Zuo 2017). Recession years are based on the business cycle dating database of the National Bureau of Economic Research (NBER). Recession years include the trough of the business cycle and all years leading to the trough (excluding the peak of the business cycle).

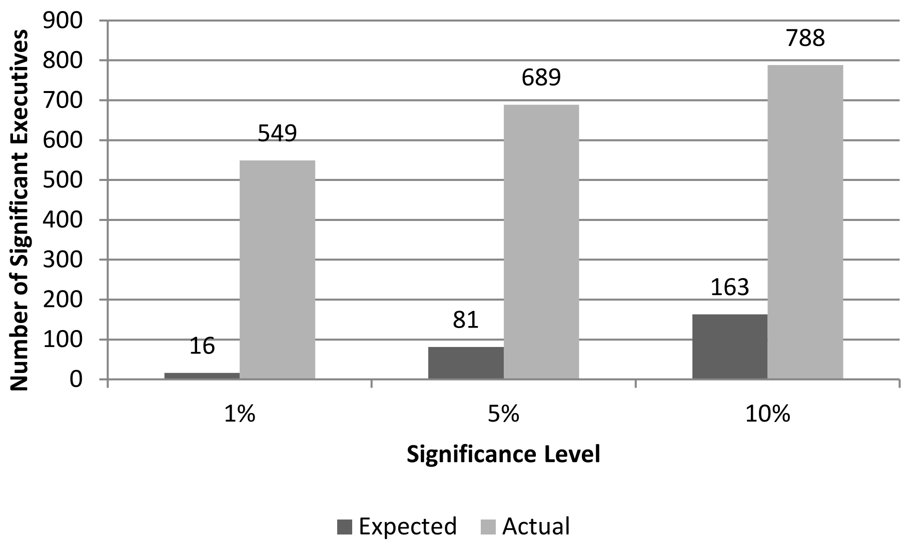
FIGURE 1

FREQUENCY OF SIGNIFICANT EXECUTIVE FIXED EFFECTS

Panel A: β_{MKT}



Panel B: $\beta_{MKT,DIMSON}$

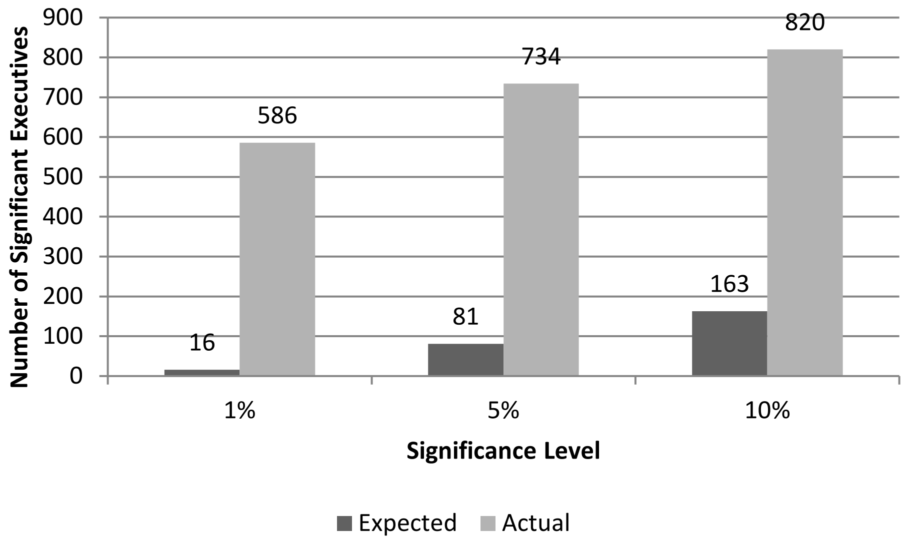


Notes:
Figure 1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

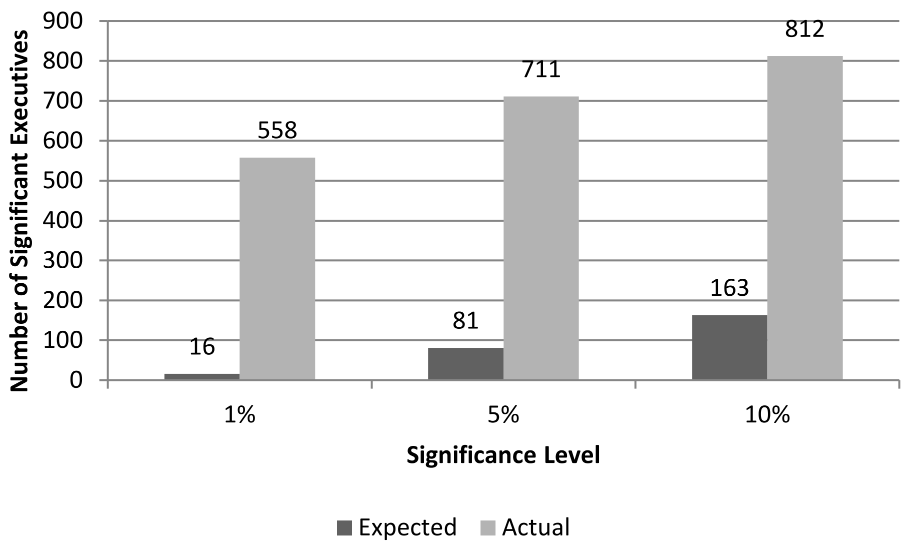
FIGURE 1 (CONTINUED)

FREQUENCY OF SIGNIFICANT EXECUTIVE FIXED EFFECTS

Panel C: $\beta_{MKT,FF6}$



Panel D: $\beta_{SMB,FF6}$



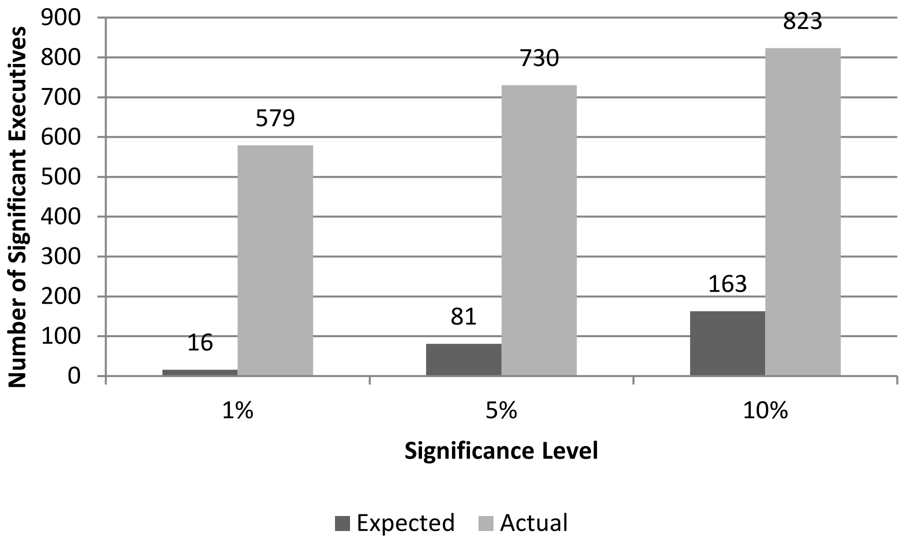
Notes:

Figure 1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

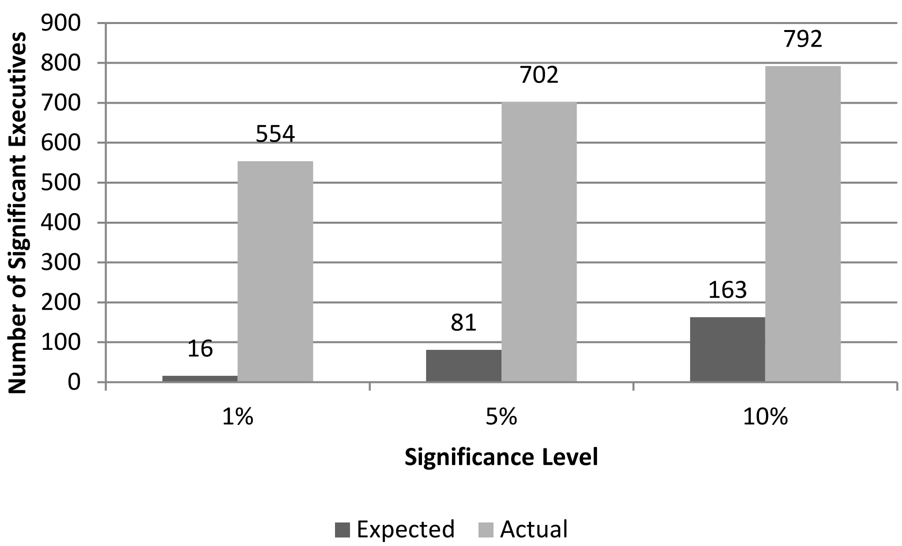
FIGURE 1 (CONTINUED)

FREQUENCY OF SIGNIFICANT EXECUTIVE FIXED EFFECTS

Panel E: $\beta_{HML,FF6}$



Panel F: $\beta_{RMW,FF6}$



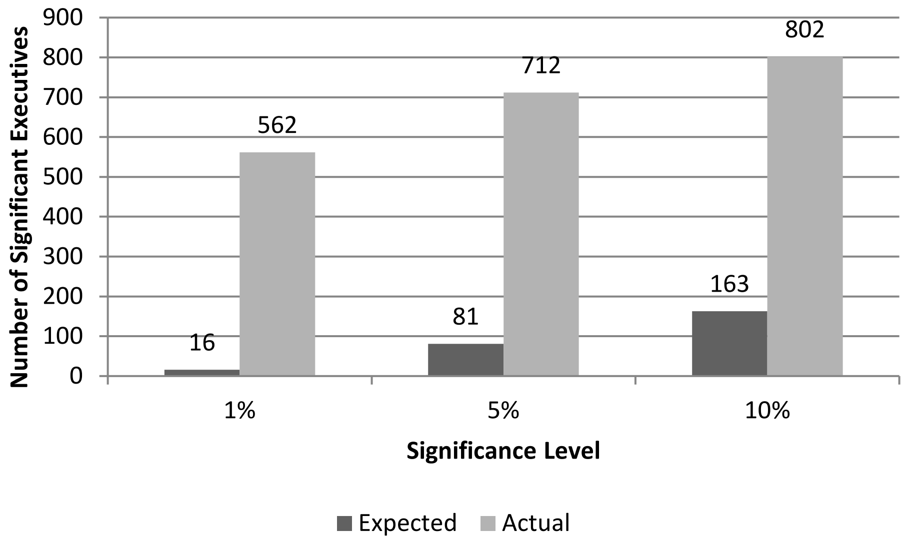
Notes:

Figure 1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

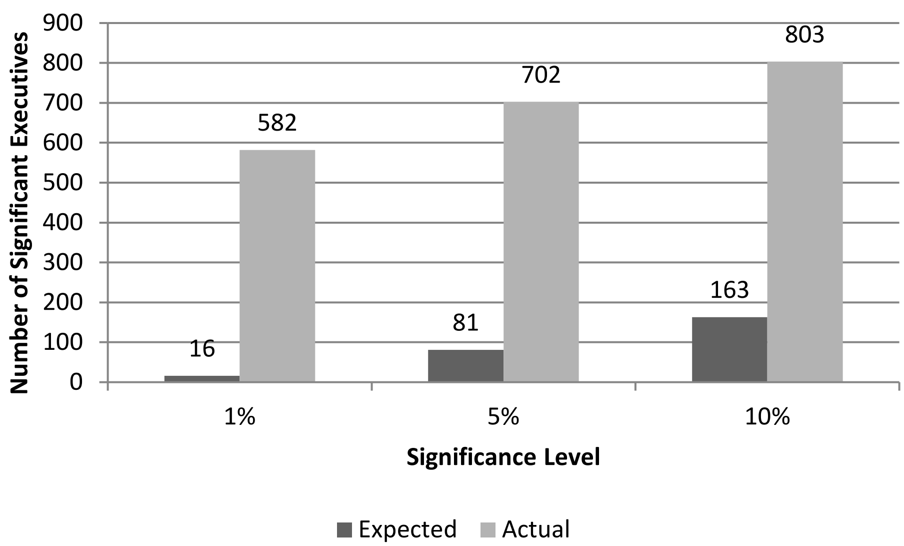
FIGURE 1 (CONTINUED)

FREQUENCY OF SIGNIFICANT EXECUTIVE FIXED EFFECTS

Panel G: $\beta_{CMA,FF6}$



Panel H: $\beta_{UMD,FF6}$

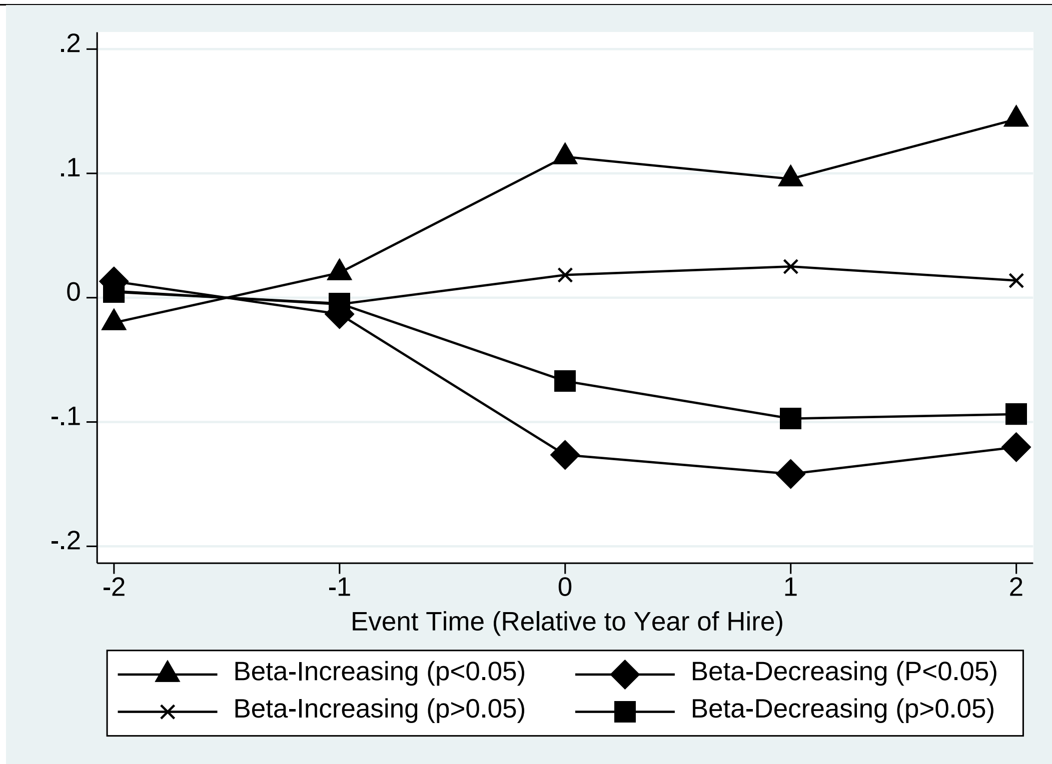


Notes:

Figure 1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

FIGURE 2

CHANGE IN BETA SURROUNDING EXECUTIVE TRANSITIONS



Notes:

Figure 2 plots the evolution of β_{MKT} for four groups: (1) firms that hire beta-increasing managers (significant at the 5% level), (2) firms that hire beta-increasing managers (not significant at the 5% level), (3) firms that hire beta-decreasing managers (significant at the 5% level), and (4) firms that hire beta-decreasing managers (not significant at the 5% level). Year 0 denotes the hiring year. To construct this figure, we subtract the average value of beta measured over the interval [-2, -1] from the raw value of beta for each firm-year. Thus, the value of beta over the interval [0, 3] represents the change in beta from the firm's average beta before the executive joined the firm.

TABLE 1

EXECUTIVE TRANSITIONS BETWEEN POSITIONS

To:	CEO	CFO	Other	Total
From:				
CEO	132	0	82	214
CFO	41	340	59	440
Other	409	74	546	1,029
Total	582	414	687	1,683

Notes:

This table summarizes executive transitions in our sample. Each manager in our sample works at least three years at two or more firms. When a manager works at three or more firms (i.e., moves more than once), we analyze the last move only. Each cell reports the number of transitions from the row position to the column position. “Other” refers to miscellaneous job titles, such as Chief Operating Officer, Corporate Secretary, General Counsel, and various subdivision Presidents or Vice-Presidents (e.g., human resources, research and development, and marketing).

TABLE 2

DESCRIPTIVE STATISTICS

	N	Mean	SD	p25	p50	p75
$TVOL$	23,762	0.027	0.014	0.018	0.024	0.033
β_{MKT}	23,762	1.082	0.521	0.722	1.021	1.366
$IVOL$	23,762	0.024	0.013	0.015	0.021	0.030
Investment	24,109	0.307	0.322	0.137	0.215	0.355
N of acquisitions	25,266	0.362	0.544	0.000	0.000	0.693
Leverage	24,415	0.353	0.313	0.103	0.326	0.500
Interest coverage	22,401	2.514	1.412	1.694	2.332	3.108
Cash holdings	24,327	0.180	0.269	0.028	0.089	0.233
Dividends/earnings	23,982	0.082	0.151	0.000	0.019	0.123
N of diversifying acquis.	25,266	0.170	0.382	0.000	0.000	0.000
R&D	24,346	0.039	0.072	0.000	0.004	0.047
Advertising	24,346	0.015	0.036	0.000	0.000	0.012
SG&A	24,482	0.239	0.181	0.106	0.209	0.333
Return on assets	24,275	0.164	0.122	0.098	0.153	0.221
Operating return on assets	24,297	0.115	0.105	0.061	0.109	0.166

Notes:
This table presents summary statistics for the sample of firms that employ a mover at some point during our sample period. All variables are defined in Appendix 1.

TABLE 3

EXECUTIVE FIXED EFFECTS ON RISK

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted* R^2
$TVOL$				23,762	.6199
$TVOL$	4.69 (<.0001, 563)			23,762	.6374
$TVOL$	3.86 (<.0001, 563)	4.53 (<.0001, 410)	8.72 (<.0001, 655)	23,762	.6655
β_{MKT}				23,762	.4294
β_{MKT}	5.00 (<.0001, 563)			23,762	.4560
β_{MKT}	4.50 (<.0001, 563)	6.14 (<.0001, 410)	4.60 (<.0001, 655)	23,762	.5010
$IVOL$				23,762	.6162
$IVOL$	4.21 (<.0001, 563)			23,762	.6330
$IVOL$	3.70 (<.0001, 563)	4.09 (<.0001, 410)	9.86 (<.0001, 655)	23,762	.6605

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 4

INFREQUENT TRADING

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
$\beta_{MKT,DIMSON}$				23,762	.3247
$\beta_{MKT,DIMSON}$	2.91 (<.0001, 563)			23,762	.3406
$\beta_{MKT,DIMSON}$	3.09 (<.0001, 563)	3.40 (<.0001, 410)	4.98 (<.0001, 655)	23,762	.3716
$IVOL_{DIMSON}$				23,762	.6165
$IVOL_{DIMSON}$	4.19 (<.0001, 563)			23,762	.6333
$IVOL_{DIMSON}$	3.72 (<.0001, 563)	3.79 (<.0001, 410)	9.98 (<.0001, 655)	23,762	.6609

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 5

FAMA-FRENCH SIX-FACTOR MODEL

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
$\beta_{MKT,FF6}$				23,768	.2080
$\beta_{MKT,FF6}$	2.76 (<.0001, 563)			23,768	.2178
$\beta_{MKT,FF6}$	2.52 (<.0001, 563)	3.27 (<.0001, 410)	4.39 (<.0001, 655)	23,768	.2383
$\beta_{SMB,FF6}$				23,768	.4196
$\beta_{SMB,FF6}$	3.07 (<.0001, 563)			23,768	.4281
$\beta_{SMB,FF6}$	2.68 (<.0001, 563)	2.64 (<.0001, 410)	5.86 (<.0001, 655)	23,768	.4454
$\beta_{HML,FF6}$				23,768	.2317
$\beta_{HML,FF6}$	2.83 (<.0001, 563)			23,768	.2395
$\beta_{HML,FF6}$	2.56 (<.0001, 563)	3.25 (<.0001, 410)	9.30 (<.0001, 655)	23,768	.2526
$\beta_{RMW,FF6}$				23,768	.2341
$\beta_{RMW,FF6}$	2.35 (<.0001, 563)			23,768	.2399
$\beta_{RMW,FF6}$	2.07 (<.0001, 563)	2.16 (<.0001, 410)	9.28 (<.0001, 655)	23,768	.2546
$\beta_{CMA,FF6}$				23,768	.1244
$\beta_{CMA,FF6}$	2.44 (<.0001, 563)			23,768	.1388
$\beta_{CMA,FF6}$	3.01 (<.0001, 563)	2.35 (<.0001, 410)	9.59 (<.0001, 655)	23,768	.1754
$\beta_{UMD,FF6}$				23,768	.0586
$\beta_{UMD,FF6}$	2.17 (<.0001, 563)			23,768	.0665
$\beta_{UMD,FF6}$	2.38 (<.0001, 563)	3.29 (<.0001, 410)	5.56 (<.0001, 655)	23,768	.0897

TABLE 5 (CONTINUED)

FAMA-FRENCH SIX-FACTOR MODEL

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted* R^2
$IVOL_{FF6}$				23,768	.6149
$IVOL_{FF6}$	4.73 (<.0001, 563)			23,768	.6320
$IVOL_{FF6}$	3.77 (<.0001, 563)	4.54 (<.0001, 410)	9.76 (<.0001, 655)	23,768	.6593

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_{\tau} + \gamma_{i} + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_{τ} are year fixed effects, γ_{i} are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 6

DISTRIBUTION OF EXECUTIVE FIXED EFFECTS

	N	Mean	SD	p25	p50	p75
$TVOL$	1,628	-0.001	0.006	-0.004	0.000	0.003
β_{MKT}	1,628	-0.011	0.303	-0.201	-0.008	0.161
$IVOL$	1,628	-0.001	0.006	-0.004	-0.001	0.002
Investment	1,600	0.004	0.134	-0.046	0.009	0.057
Inv to Q sensitivity	1,621	-0.011	0.381	-0.093	-0.007	0.066
Inv to CF sensitivity	1,621	-0.017	0.820	-0.098	-0.016	0.060
N of acquisitions	1,640	-0.008	0.329	-0.139	-0.014	0.140
Leverage	1,638	0.002	0.140	-0.060	0.002	0.076
Interest coverage	1,615	-0.047	0.591	-0.282	-0.031	0.204
Cash holdings	1,639	-0.001	0.103	-0.044	0.000	0.043
Dividends/earnings	1,636	-0.002	0.133	-0.023	0.002	0.020
N of diversifying acquis.	1,639	0.003	0.201	-0.069	-0.007	0.062
R&D	1,639	0.001	0.019	-0.006	0.001	0.008
Advertising	1,639	0.000	0.008	-0.001	0.000	0.002
SG&A	1,639	-0.002	0.045	-0.017	-0.001	0.013
Return on assets	1,640	0.003	0.065	-0.027	0.002	0.034
Operating return on assets	1,640	0.003	0.058	-0.025	0.001	0.028

Notes:

This table presents the distribution of the manager fixed effects estimated in Table 3, as well as the distribution of the manager fixed effects studied in Bertrand and Schoar (2003). For brevity, we do not report the estimation of the latter. For details on each corporate policy regression, please refer to Bertrand and Schoar (2003). We weight each manager fixed effect by the inverse of its standard error to account for estimation error.

TABLE 7

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICY

Panel A: Factor Loadings

	Factor 1	Factor 2	Factor 3
Investment	0.047	-0.052	0.326
Inv to Q sensitivity	-0.010	0.054	-0.048
Inv to CF sensitivity	-0.010	0.025	0.021
N of acquisitions	1.000	-0.002	0.000
Leverage	-0.063	-0.452	-0.117
Interest coverage	0.015	1.000	0.000
Cash holdings	0.022	0.082	0.755
Dividends/earnings	-0.048	0.020	0.058
N of diversifying acquis.	0.756	-0.012	0.021
R&D	0.030	0.032	0.591
Advertising	0.060	-0.004	0.133
SG&A	0.014	0.002	0.008

TABLE 7

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICY

Panel B: Eigenvalues and Variance Explained

	Eigenvalue	Pct. Explained	Cumulative Pct.
Factor 1 (external growth)	1.585	0.132	0.132
Factor 2 (financial conservatism)	1.219	0.102	0.234
Factor 3 (internal growth)	1.063	0.089	0.322

Notes:
We perform factor analysis on the manager fixed effects studied in Bertrand and Schoar (2003). Our results are obtained using Stata's *factor* command with the *ml* and *altdivisor* options (Kaplan and Sorensen 2021). All factors are non-rotated; however, our results are not sensitive to factor rotation. Using a Scree test (Cattell 1966), we determine that there are three factors. Panel A reports the factor loadings of the three factors. Factor loadings greater than 0.15 in absolute value are highlighted. Panel B reports the eigenvalues and the proportion of variation explained by the three factors.

TABLE 7

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICY

Panel C: Relation Between Factors and Executive Fixed Effects on Risk

	$TVOL$	β_{MKT}	$IVOL$
Factor 1 (external growth)	-0.026	-0.021	-0.053
	(0.036)	(0.041)	(0.034)
Factor 2 (financial conservatism)	-0.133***	-0.069*	-0.125***
	(0.040)	(0.039)	(0.038)
Factor 3 (internal growth)	0.129**	0.259***	0.102
	(0.066)	(0.066)	(0.063)
Performance	-0.176***	-0.012	-0.168***
	(0.039)	(0.054)	(0.042)
N	1,548	1,548	1,548
R^2	0.074	0.041	0.070

Notes:

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$F.E.(Risk)_j = \alpha + \delta_1 Factor_{1j} + \delta_2 Factor_{2j} + \delta_3 Factor_{3j} + \delta_4 Performance_j + \varepsilon_j$$

where j indexes managers. We weight each observation by the inverse of the standard error of the independent variable. Each column in Panel C of Table 7 reports the coefficients from a different multiple regression.

TABLE 8

MECHANISM: FIRM-LEVEL DETERMINANTS OF BETA

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
$TVOL$				22,382	.6685
$TVOL$	4.75 (<.0001, 556)			22,382	.6811
$TVOL$	4.19 (<.0001, 556)	6.08 (<.0001, 410)	10.65 (<.0001, 648)	22,382	.7056
β_{MKT}				22,382	.4465
β_{MKT}	4.99 (<.0001, 556)			22,382	.4726
β_{MKT}	4.45 (<.0001, 556)	5.92 (<.0001, 410)	4.71 (<.0001, 648)	22,382	.5151
$IVOL$				22,382	.6855
$IVOL$	4.26 (<.0001, 556)			22,382	.6960
$IVOL$	4.05 (<.0001, 556)	6.35 (<.0001, 410)	10.75 (<.0001, 648)	22,382	.7175

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \boldsymbol{\beta X}_{i\tau} + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, λ are manager fixed effects, and $\boldsymbol{X}_{i\tau}$ is a vector of time-varying firm characteristics (size, book-to-market, and leverage). The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 9

MECHANISM: EXECUTIVE FIXED EFFECTS ON UNLEVERED BETA

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
β^U_{MKT}				22,405	.4335
β^U_{MKT}	5.32 (<.0001, 561)			22,405	.4535
β^U_{MKT}	5.59 (<.0001, 561)	4.28 (<.0001, 409)	6.88 (<.0001, 649)	22,405	.4941

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 10

EXECUTIVE CHARACTERISTICS

Panel A: Descriptive Statistics

	N	Mean	SD	p25	p50	p75
Male	1,536	0.937	0.243	1.000	1.000	1.000
Recession	1,536	0.237	0.425	0.000	0.000	0.000
Birth Year	1,536	1953	8.268	1948	1954	1959

Notes:

This table presents summary statistics for the sample of managers for whom we were able to estimate manager fixed effects. All variables are defined in Appendix 1.

TABLE 10

EXECUTIVE CHARACTERISTICS

Panel B: Relation Between Executive Characteristics and Executive Fixed Effects on Risk

	Signed Manager Fixed Effects		
	$TVOL$	β_{MKT}	$IVOL$
Male	-0.160	0.008	-0.135
	(0.190)	(0.144)	(0.192)
Recession	-0.120	-0.240**	-0.037
	(0.100)	(0.100)	(0.099)
Birth Year	-0.005	0.007	-0.003
	(0.013)	(0.014)	(0.013)
Industry Fixed Effects	Yes	Yes	Yes
Decade Fixed Effects	Yes	Yes	Yes
N	1,536	1,536	1,536
R^2	0.081	0.099	0.069

Notes:

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression

$$F.E.(Risk)_j = \alpha + \delta Male_j + \eta Recession_j + \gamma Birth\,Year_j + \varepsilon_j$$

where j indexes managers. We weight each observation by the inverse of the standard error of the independent variable. Decade fixed effects are based on the decade in which the manager was born. Industry fixed effects are based on the industry (two-digit SIC) of the last firm we observe each manager in. Each column in Table 10 reports the coefficients from a different multiple regression.

TABLE 11

EXECUTIVE DISCRETION

	Unsigned Manager Fixed Effects		
	$TVOL$	β_{MKT}	$IVOL$
Institutional holdings	-0.215	-0.123	-0.177
	(0.148)	(0.132)	(0.142)
Size	-0.058***	-0.052***	-0.062***
	(0.018)	(0.019)	(0.017)
Return on assets	0.049	-0.082	0.137
	(0.439)	(0.406)	(0.393)
Leverage	0.010	0.004	0.026
	(0.032)	(0.019)	(0.037)
Tobin's Q	-0.019	-0.001	-0.024
	(0.019)	(0.025)	(0.019)
Value-weighted market return	-0.101	0.179	-0.051
	(0.202)	(0.165)	(0.203)
N	1,159	1,159	1,159
R^2	0.033	0.023	0.033

Notes:

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$\left|F.E.(Risk)_j\right| = \alpha + \delta FIRM_{ij\tau-1} + \eta VWRET_{\tau-1} + \varepsilon_j$$

i, j, and τ index firms, managers, and years, respectively. We weight each observation by the inverse of the standard error of the independent variable. Each column in Table 11 reports the coefficients from a different multiple regression. The dependent variable is the absolute value of the manager fixed effect on the column variable. *FIRM* is a vector of firm-level variables: institutional holdings, firm size, return on assets, leverage, and Tobin's Q. *VWRET* is the return on the CRSP value-weighted market portfolio. We measure *FIRM* in the last firm we observe each manager in, and we measure all independent variables (*FIRM* and *VWRET*) in the year before each executive transition.

TABLE 12

HIRING PREFERENCES

	Signed Manager Fixed Effects		
	$TVOL$	β_{MKT}	$IVOL$
Institutional holdings	0.284	0.076	0.230
	(0.199)	(0.203)	(0.189)
Size	0.041*	0.040	0.029
	(0.025)	(0.029)	(0.024)
Return on assets	-1.173**	-0.925*	-1.000**
	(0.490)	(0.525)	(0.483)
Leverage	0.038	0.027	0.038
	(0.050)	(0.052)	(0.043)
Tobin's Q	0.060**	0.065*	0.037
	(0.026)	(0.038)	(0.027)
Value-weighted market return	0.248	0.110	0.243
	(0.285)	(0.255)	(0.281)
N	1,159	1,159	1,159
R^2	0.044	0.022	0.032

Notes:

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$F.E.(Risk)_j = \alpha + \delta FIRM_{ij\tau-1} + \eta VWRET_{\tau-1} + \varepsilon_j$$

i, j, and τ index firms, managers, and years, respectively. We weight each observation by the inverse of the standard error of the independent variable. Each column in Table 12 reports the coefficients from a different multiple regression. The dependent variable is the signed manager fixed effect on the column variable. *FIRM* is a vector of firm-level variables: institutional holdings, firm size, return on assets, leverage, and Tobin's Q. *VWRET* is the return on the CRSP value-weighted market portfolio. We measure *FIRM* in the last firm we observe each manager in, and we measure all independent variables (*FIRM* and *VWRET*) in the year before each executive transition.