

# CEO Fitness and Firm Value<sup>◇</sup>

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This Draft: September 2014

## ABSTRACT

This study finds a positive relation between CEO fitness and firm value. For each of the years 2001 to 2011, we define CEOs of S&P 1500 companies as being fit if they finish a marathon. The literature suggests that fitness moderates stress and positively affects cognitive functions and performance. Accordingly, we find the strongest effects on firm value in subsamples where fitness is most important, i.e., for CEOs with high workload, above median age, and above median tenure. Fit CEOs are further associated with significantly higher abnormal announcement returns in M&A bids for large, public, and cross-border targets, concomitant with high stress. Our findings can explain the importance of CEO fitness in the managerial labor market and the trend among CEOs to stay fit.

*JEL classification:* G32, G34, J24

*Keywords:* CEO characteristics, CEO fitness, CEO work load, firm value, mergers and acquisitions

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Part of the paper was written while Limbach was visiting Rotterdam School of Management at Erasmus University Rotterdam.

<sup>◇</sup> We thank André Betzer, Alexander Kempf, Alexander Pütz, Martin Ruckes, and Meik Scholz for very helpful comments and discussions. Sonnenburg thanks Hannah Raible and Florian Stürz for research assistant.

*“It’s a mistake to ignore fitness in a high-stress, high-impact job.”*

- Jack Brennan, former CEO of The Vanguard Group and marathon runner

## 1 Introduction

In this study, we document an economically significant, positive relation between chief executive officer (CEO) fitness and firm value. We thereby contribute to the growing literature about CEO-specific heterogeneity and its impact on firm policies and value (see, e.g., Benmelech and Frydman (2014), Bertrand (2009), Custódio and Metzger (2013), and Custódio and Metzger (2014)). So far, the literature has remained relatively silent about physical aspects for which data is usually not available. We close this gap. To measure fitness, we use hand-collected data on U.S. marathons finished by S&P 1500 CEOs over the period 2001-2011.

Fitness moderates stress and increases cognitive and job performance. Thus, it should be relevant for CEOs as they face high levels of demands and responsibilities, particular work stress and physical requirements (Hambrick, Finkelstein, and Mooney (2005), and Lovelace, Manz, and Alves (2007)). CEOs make far-reaching decisions, are exposed to 24/7 media scrutiny and deal with changing schedules and global travel. It is hence not surprising that the business press has featured several articles about CEO job fatigue and the role of fitness in the managerial labor market.<sup>1</sup> In line with the emerging importance of CEO fitness, there is a growing trend among executives to participate in endurance sports, especially marathons.<sup>2</sup>

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<sup>1</sup> The Wall Street Journal (WSJ) article „When Job Fatigue Hits the CEO” (May 07, 2013) comments on a study by the Harvard Medical School faculty in which more than 90% of all senior leaders report to feel burned out, with one-third feeling extremely burned-out. The WSJ article „Want to Be CEO? What’s Your BMI?” (January 16, 2013) comments on the importance of fitness for CEOs. It states: *“While marathon training and predawn workouts aren’t explicitly part of a senior manager’s job description, leadership experts and executive recruiters say that staying trim is now virtually required for anyone on the track for the corner office.”*

<sup>2</sup> See „Executive endurance” in The Wall Street Journal MarketWatch on October 04, 2007. The article reports about the increasing number of CEOs and high-ranked managers to run marathons. It states that *“[...] for many CEOs, a motivation to keep running is that it leads to business success by reducing stress, creating a balance in their lives and fostering a mental toughness that can bring rewards in the boardroom.”*

The use of marathon data to measure CEO fitness is motivated by the nature of running: it can be done at virtually any place and any time, without any sports gear or teammates. Consequently, it is a primary sport for people who travel a lot, have changing schedules, a high need for flexibility and considerable work load, such as CEOs. Furthermore, the most common reason among marathoners to start running is to improve fitness (Summers, et al. (1982)). Consistent with the growing importance of CEO fitness, we find that an increasing number of CEOs run marathons (see Figure 2).

Studies from the fields of biology, medicine, psychology and sports find that physical activity and fitness have buffering effects on stress (e.g., Gal and Lazarus (1975), Brown (1991), and Unger, Johnson, and Marks (1997)) as well as positive effects on cognitive functions and executive-control processes like coordination, planning and working memory (e.g., Colcombe and Kramer (2003), and Kramer, et al. (1999)), and on academic and job performance (e.g., Coe, et al. (2006), and Rhea, Alvar, and Gray (2004)). Accordingly, fit CEOs should be less exhausted and better able to stand the high stress of their jobs and should thus be associated with better performance.

Using a panel of more than 9,500 firm-year observations, we find that CEOs who finish a marathon in a given year – denoted as fit CEOs – are associated with a significantly higher firm value (Tobin’s Q). Results are found both on univariate and multivariate level and are economically significant: firm value is between 4% and 10% larger for firms managed by a fit CEO (taking controls into account).

Analyzing subsamples, we provide strong evidence on the positive relation between CEO fitness and firm value consistent with the reasoning that fitness facilitates CEOs’ performance and ultimately affects Tobin’s Q. Specifically, fitness should be most important for older managers (as physical and cognitive abilities decline with age), for CEOs who have been in a top position for many years (and thus get exhausted over time), and for CEOs with

high workload (and hence high stress). Accordingly, we find that fit CEOs have a significantly positive effect on firm value in the subsample of CEOs with above-median age, those with above-median tenure as well as the subsample of high-workload CEOs defined as CEOs with two or more outside board seats.

The results for both the full sample and the subsamples hold after controlling for CEO, firm and governance characteristics, past performance and firm fixed effects. To further check the robustness of our results, we address several alternative explanations. Most important, our results might be the outcome of unobserved CEO heterogeneity. For example, fit CEOs could generally be more talented or could have an athletic background and a higher level of discipline which might enable them to run marathons and successfully manage their firms. Thus, our measure of CEO fitness could simply capture unobserved CEO characteristics instead of measuring CEOs' actual fitness. To address this issue, we exploit CEO-specific variation over our fitness measure and rerun all regressions using CEO-firm fixed effects. Results remain unchanged, also when we consider other alternative explanations.

To provide a better understanding of the effects of CEO fitness, we further examine mergers and acquisitions (M&As), which constitute the largest and most complex investments firms undertake. When attempting to purchase other companies, CEOs have to deal with extreme levels of pressure, responsibility, and stress. They have to make decisions which affect the entire bidder and target firm, while being exposed to considerable scrutiny by the media and the firms' owners. Consequently, they have to do a very good job while standing a high level of stress.<sup>3</sup> These aspects should be particularly distinct in bids for large, public and cross-border targets which are the most far-reaching M&A investment decisions characterized by extensive media scrutiny, increased uncertainty and risk of failure. Thus, CEO fitness should be highly relevant. Consistent with our reasoning, we find that fit CEOs are associated

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<sup>3</sup> In this context, Lehn and Zhao (2006) find that CEOs who are bad bidders are significantly more likely to be replaced.

with significantly higher abnormal announcement returns in bids for public targets (characterized by tough negotiations and much media attention) and in bids for considerably large and cross-border targets (characterized, e.g., by difficult post merger integrations). Results are economically significant: abnormal returns are between 1.7 and 3.0 percentage points larger if these deals are done by fit CEOs.

Our study contributes to the recently emerging literature about the importance of CEOs' physiology by introducing CEO fitness as a relevant factor for firm value. Two studies are related to our work in the sense that they also consider aspects of CEOs' physiology. Both use data about CEOs' facial traits to examine how others perceive CEO's outward appearance and whether this affects CEOs and the firms they manage. In experimental work, Graham, Harvey, and Puri (2014) find that CEOs' "look of competence" positively affect their compensation and selection, while it does not affect firm performance. Halford and Hsu (2013) find that S&P 500 CEOs who score high in a facial attractiveness index are associated with higher compensation, higher firm value, and higher M&A announcement returns.

In general, we contribute to the growing literature on CEO-specific heterogeneity based on Bertrand and Schoar (2003). Our findings suggest that fitness is an explainer for CEO heterogeneity so far unaddressed by the literature. Existing studies have identified CEO attributes, often time-invariant, such as military background (e.g., Benmelech and Frydman (2014)), industry and financial expertise (Custódio and Metzger (2013), and Custódio and Metzger (2014)), general managerial and interpersonal skills (e.g., Custódio, Ferreira, and Matos (2013), and Kaplan, Klebanov, and Sorensen (2012)), narcissism (e.g., Chatterjee and Hambrick (2007)) or early-life experience and overconfidence (e.g., Malmendier, Tate, and Yan (2011), and Schoar and Zuo (2011)). In contrast to several of these studies, we identify a value-relevant (physical) attribute that can actively be influenced by CEOs and CEO candidates themselves, basically over their entire career.

Our results are not only important for shareholders, but also for participants in the managerial labor market including CEOs, senior executives, firms' board members, and executive recruiting firms. We provide a rationale for why recruiting firms define physical fitness as a requirement for potential CEO candidates and can explain the growing trend among executives to stay fit. We believe that our results can be applied to other executives with jobs that resemble the job of the corporate CEO.

The remainder of this paper is organized as follows. In Section 2, we describe the data and sample. Section 3 presents our empirical results for the relation between CEO fitness and firm value and deals with the robustness of these results by addressing issues of identification and alternative explanations. In Section 4 we examine the role of CEO fitness in mergers and acquisitions. Conclusions follow.

## **2 Sample and Data Description**

### **2.1 Data on marathons and sample selection**

To construct our sample, we use two main data sources. Our panel of S&P 1500 firms is from the Corporate Library's *Board Analyst* database and covers the sample period 2001 to 2011.<sup>4</sup> The database provides detailed information about CEOs' names, gender, age and year of birth. This information is necessary to accurately match a firm-CEO panel with CEO-specific data (lacking CEO identifiers). This CEO-specific information constitutes our second

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<sup>4</sup> The Corporate Library's *Board Analyst* database is a machine-readable database which provides proxy-statement data including detailed information about CEOs and about firms' governance structures. The database has some advantages over other comparable databases as it includes information about founder CEOs, exact descriptions of chairmen that result in a comprehensible flag for CEO duality, as well as information about firms' age since foundation, a primary indicator for the stage of a firm's life cycle. Data is available for the year 2001 onwards. The database is used in several recent studies on corporate boards, such as Alam, et al. (2014) and Knayazeva, Knayazeva, and Raheja (2013).

main source of data, information about CEOs who finish marathons. We define these CEOs as fit CEOs. We hand collect all necessary information from public data sources on the internet.

Specifically, we collect data about all people who finished one of the fifteen largest U.S. marathons (in terms of the number of finishers) over the sample period. Table 1 provides an overview of the marathons we consider. For the vast majority of these marathons, information about finishers is available on the respective marathons' websites. For each person who finished one of the marathons in the 2001-2011 period, we gather the following data: first name, last name, age, gender, country. In case data are not available on the official marathon websites, we gather the data from [www.marathonguide.com](http://www.marathonguide.com), a public website providing detailed information about U.S. marathons from 2000 onwards.

– Please insert TABLE 1 approximately here –

Our data gathering process generates a sample of almost 2.4 million non-distinct and more than 1.5 million distinct marathon finishers. This sample accounts for about 50% of all non-distinct U.S. marathon finishers over the sample period and most likely for an even larger fraction of distinct marathoners.<sup>5</sup> The estimated total number of U.S. marathon finishers between 1990 and 2011 is shown in Appendix A.

Our focus on the fifteen largest U.S. Marathons, in order to keep the costs of hand-collection of data manageable, does not appear to be a serious limitation for our empirical analysis. In fact, the locations of the marathons we use fit the geographical distribution of the S&P 1500 firms very well as illustrated in Figure 1. In the figure we use zip codes to plot the locations of all S&P 1500 companies' headquarters in the U.S. The runner symbol indicates

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<sup>5</sup> The fact that we do not cover all U.S. marathon finishers may bring with it that we potentially exclude some CEOs (who finished a marathon but remain unidentified) from the group of fit CEOs. Yet, in this case, our reference group also contains some fit CEOs and thus we rather underestimate the true effects of CEO fitness.

the location of the marathons we use. As can be seen from Figure 1, we cover the vast majority of all major U.S. business centers.<sup>6</sup>

– Please insert FIGURE 1 approximately here –

We match our data on marathon finishers described above with the initial sample of CEOs from the *Board Analyst* database using the information about each CEO's first name, last name, and age. Particularly, if the first name, the last name, and the age of the marathon finisher exactly match the CEO's first name, last name and age, we define this as a positive (non-final) match. In case the names perfectly match, but the age matching results in an age difference between the CEO and the marathon finisher of one year, we consider this a potential positive (non-final) match. The reason is that it is possible that the CEO's birthday is before or after the marathon event and thus our matching procedure creates an age difference greater than zero, although the match may be correct. All matches are then manually checked (if possible) by screening the internet using LexisNexis, LinkedIn, and different Google searches, among other sources. Additionally, we gather data on name distributions from the U.S. census to calculate - for each positive match we identify - the probability of a false positive match for a given CEO's first name, last name and age.<sup>7</sup> Whenever the probability is greater than ten percent, we define an initially positive match as an unsuccessful one.

Using the described procedure, we find that six percent of all CEOs can be classified as fit, i.e., they finish at least one marathon in our sample period (also based on firm-year observations). The fraction of CEOs with at least one finished marathon has almost doubled between 2001 and 2011, as can be seen from Figure 2 which shows the annual percentage of

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<sup>6</sup> One might argue that we capture regional aspects with our CEO fitness measure because the CEOs of sample firms not located in business centers could be less likely to participate in the marathons we examine. However, this is unlikely to affect our analyses as we use firm fixed effects in all regressions and as headquarter changes are very rare events (see Pirinsky and Wang (2006)).

<sup>7</sup> Therefore, we assume that the 1.5 million distinct marathon finishers in our marathon dataset are representative for the U.S. population and consequently handle them as random draws from the U.S. population. This way, we can estimate the probability of a randomly achieved false positive match for a given CEO.



CEOs identified as marathon finishers over the sample period. In recent years the fraction of CEOs with at least one finished marathon is around seven to eight percent. CEOs finish two marathons on average; the maximum is ten.

– Please insert FIGURE 2 approximately here –

Our final sample consists of 9,549 firm-year observations (by 2,694 CEOs) containing information about CEO, firm and governance characteristics. CEO-specific data include age, tenure, duality, and whether the CEO is the firm's founder. Governance characteristics include board size, the fraction of independent directors, Bebchuk, Cohen, and Ferrell (2009) E-index, and whether the majority of a firm's outstanding shares are held by institutions (i.e., institutional majority). Firm characteristics include the standard controls used in the literature, i.e., firm age and size, leverage, operating cash flow, capital expenditures (CapEx), R&D, and business segments. Accounting data is from Compustat. Our measure for firm value is Tobin's Q. All variables are defined in Appendix B.

## **2.2 Summary statistics**

The summary statistics for our sample are presented in Table 2. In terms of CEO characteristics, we report that the typical CEO in our sample is 55 years old and has been on the company's board for 11 years. 63% of the CEOs in our sample have a dual role, i.e., are also the chairman of their board, and 8% of the CEOs are the founders of the company. The typical firm in our sample has a book leverage of 21%, R&D (defined as R&D expenses over sales) of 5%, CapEx (over sales) of 7%, and an operating cash flow of 11%. Mean (median) Tobin's Q is 1.81 (1.46). Mean firm age since foundation is 50 years and mean firm size is \$2.54 billion (i.e.,  $\ln(\text{total assets}_{t-1})$  is 7.84). Firms have three business segments on average. Regarding governance characteristics, our sample firms have a mean fraction of independent

directors of 70%, a board size of 9, and a mean E-index is 2.67. For 81% of our sample firms the majority of their outstanding shares is held by institutions.

In terms of CEO, firm and governance characteristics, our sample compares well to the related existing literature (e.g., Adams, Almeida, and Ferreira (2005), Alam, et al. (2014), Benmelech and Frydman (2014), Custódio and Metzger (2014), Fahlenbrach (2009), and Knayazeva, Knayazeva, and Raheja (2013)).<sup>8</sup> An important statistic for our study is the CEO's age as we use it for our marathon runner-CEO match and to create subsamples. Among other studies, Custódio and Metzger (2014) and Yim (2013) report the same mean and median CEO age as we do.

– Please insert TABLE 2 approximately here –

Table 2 also presents summary statistics for the subsamples of firms with and without fit CEOs (i.e., the variable *Fit CEO* is used to split the sample). Tests for mean and median differences suggest that the two subsamples show a few significant disparities: fit CEOs who are younger (53 vs. 55 years), manage smaller companies (with smaller boards), and are associated with higher investments (CapEx). Most important, Tobin's Q is significantly higher, comparing both mean and median values, for firms managed by fit CEOs. Univariate differences are economically important as Tobin's Q is between 5% und 19% larger. Figure 3 illustrates the annual differences in firm value between firms with and without fit CEOs for our sample period.

– Please insert FIGURE 3 approximately here –

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<sup>8</sup> For example, Adams, Almeida, and Ferreira (2005) and Fahlenbrach (2009) report fractions of founder CEOs of 9% and 10.6%, respectively, only slightly larger than the 8% we report. These studies also report comparable values with regard to firm age since the company's foundation, CapEx, leverage, and number of business segments. In terms of governance characteristics, our statistics are comparable to those in Alam, et al. (2014) and Knayazeva, Knayazeva, and Raheja (2013) who also use the *Board Analyst* database. Other studies (using other data sources) report comparable statistics. Cremers and Romano (2011), for example, report comparably high values for institutional ownership (72%), while Bebchuk, Cohen, and Ferrell (2009) report comparable values for their E-index.

As can be seen from Figure 3, except for the beginning of our sample period (years 2001 and 2002), Tobin's Q is always higher for the sample of fit CEOs. Hence, a positive effect of CEO fitness on firm value is directly reflected in the data.

### **3 Empirical results**

In this section, we analyze the relation between CEO fitness and firm value. Therefore, subsequent to the univariate results from Section 2, we examine in Section 3.1 whether the positive effect of CEO fitness on firm value can also be detected in a multivariate setting. In Section 3.2, we motivate the analyses of several subsamples of our firm panel based on the existing literature about fitness and the effects of aging and work stress. This way, we provide detailed evidence on firm value consistent with the benefits of CEO fitness.

#### **3.1 CEO fitness and firm value: evidence from the full sample**

We test the relation between CEO fitness and firm value using our full sample of 9,549 firm-year observations as described in Section 2.2. In Table 3, we show results from firm fixed effects regressions of the natural logarithm of Tobin's Q (specification (1)) and Tobin's Q (specification (2)) on CEO, firm and governance variables. The main independent variable is *Fit CEO* which equals one if a CEO finishes a marathon in a given year. The regression specifications include time fixed effects.

In terms of control variables, we follow recent related studies examining firm value (e.g., Custódio and Metzger (2014), Fahlenbrach (2009), and Nguyen and Meisner Nielsen (2014)). Apart from the standard firm characteristics – capital expenditures (CapEx), firm age, firm size, leverage, number of business segments, operating cash flow, and R&D – we control

for CEO characteristics commonly used in the literature. These are the CEO's age, tenure, whether he or she is the founder of the company and a control for CEO-chairman duality. Including firm size and age since foundation, business segments, and a CEO founder dummy, we are able to accurately account for the stage of a firm's life cycle. We control the firms' operating performance using the variable operating cash flow. Further, the CEO's age and tenure constitute important controls as they have been shown to negatively affect firms' investment activities and risk (e.g., Li, Low, and Makhija (2014), and Pan, Wang, and Weisbach (2013)), while they also negatively correlate with the likelihood that a CEO is a marathon finisher. Controls for the firms' level of corporate governance are used as well. These are the firms' board size and fraction of independent directors, a dummy for institutional majority ownership of outstanding shares, and the E-index (to proxy managerial entrenchment). Together with the CEO-specific variables, we are thus able to account for the power and experience of CEOs.

– Please insert TABLE 3 approximately here –

The results in Table 3 corroborate our findings from Section 2. Fit CEOs are associated with a significantly higher firm value. The coefficient of the variable *Fit CEO* is statistically significant at the 5% level in both specifications. It is also economically significant as can be seen from specification (1) in which we use the natural logarithm of Tobin's Q (denoted  $\ln(\text{Tobin's Q})$ ) as the dependent variable. The coefficient of *Fit CEO* is 0.0461 suggesting that Tobin's Q is about 5% higher for fit CEOs, taking the effects of all control variables into account.

With regard to the employed control variables, we report that firm size, leverage and the E-index have a significantly negative effect on Tobin's Q, while operating cash flow, R&D and institutional ownership have a significantly positive effect. The results are in line with the related studies named above and with recent studies on corporate governance, CEO

power and firm value (see, e.g., Bebchuk, Cohen, and Ferrell (2009), and Fracassi and Tate (2012)).<sup>9</sup>

### **3.2 CEO fitness and firm value: evidence from subsamples**

In this section, we attempt to provide evidence particularly consistent with the positive effect of CEO fitness on firm value. Therefore, we consider subsamples of our dataset for which we expect to find the strongest effects of CEO fitness on firm value. Specifically, we isolate groups of CEOs to proxy for circumstances under which CEO fitness should be most beneficial. These groups are older CEOs, high-tenure CEOs, and CEOs with a high workload.

Several studies suggest that physical and cognitive abilities decline with age (see, e.g. Verhaeghen and Salthouse (1997)) and that executive functions are especially prone to this effect (Rhodes (2004) and Taylor (1975)). Physical fitness, however, has been shown to counteract negative aging effects. In fact, physical activity and fitness positively affect cognitive functions and executive-control processes (e.g., coordination, planning and working memory) as well as academic and job performance (see Colcombe and Kramer (2003), Coe, et al. (2006), Kramer, et al. (1999), and Rhea, Alvar, and Gray (2004)). Thus, we expect a particularly strong effect of CEO fitness on firm value for the subsample of older CEOs.

For CEO tenure, a reasoning related to and based upon that for CEO age can be made. Consistent with anecdotal evidence (see footnote 1), we argue that over their tenure CEOs increasingly get exhausted, both physically and emotionally, due to the high demands and responsibilities of their 24/7-job. In this context, job demands are found to be positively associated with emotional exhaustion of organizational leaders (Knudsen, Ducharme, and

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<sup>9</sup> With regard to the CEO characteristics age, duality, founder and tenure, the literature finds either insignificant or opposing effects. For example, while Fahlenbrach (2009) finds a positive effect of founder CEOs on firm value, Nguyen and Meisner Nielsen (2014) find no effect, and Li, Lu, and Phillips (2014) find a negative effect. Similar examples can be made for all other CEO characteristics we use.

Roman (2009)) and to lead to burnout over time (Schaufeli and Bakker (2004)). Furthermore, CEOs usually have been in an already exhausting role (e.g., as CFO or COO) before. Due to its positive effect on performance (Coe, et al. (2006), and Rhea, Alvar, and Gray (2004)) and its moderating effect on stress (e.g., Gal and Lazarus (1975), Brown (1991), and Unger, Johnson, and Marks (1997)), we expect fitness to be of particular importance for CEOs who have held this position for many years. Hence, the effect of CEO fitness on firm value should be particularly strong in the subsample of high-tenure CEOs.

Finally, given its performance-enhancing and stress-buffering effect, we expect fitness to be highly relevant for CEOs with a relatively high workload. We follow the literature on busy directors and CEOs – see Fich and Shivdasani (2006) and Perry and Peyer (2005), respectively – and define CEOs as having a high workload if they hold two or more outside board seats. This measure of CEO workload is straightforward as any additional board seat outside the firm imposes a great extra workload on the CEO. In this regard, Perry and Peyer (2005) cite the National Association of Corporate Directors (NACD) which recommends to “budget at least four full 40-hour weeks of service for every board on which [the directors] serve” (see page 2084). Further, as members of the board of directors of other companies, CEOs with outside board seats are exposed to a higher stress level caused by even more unexpected corporate events that necessitate taking fast actions and, thus, spontaneous changes in their schedule. Due to the aforementioned aspects, the effect CEO fitness on firm value should be particularly strong for high-workload CEOs.

In Table 4 we present the results of our subsample analyses. In specifications (1) and (2) we split the sample into subsamples based on CEO age. Specification (1) shows the results for CEOs who are younger than (or as old as) the sample median (55 years). Specification (2) shows the results for CEOs with above median age. Specifications (3) and (4) show results based on CEO tenure. We again use the sample median to create subsamples. In the remaining

two specifications, we consider CEO workload. Specification (5) shows the results for the subsample of high-workload CEOs and specification (6) shows the results for the remaining CEOs (with one or no outside board seats). We run firm fixed effects regressions similar to those in Section 3.1. The dependent variable is the natural logarithm of Tobin's Q.

– Please insert TABLE 4 approximately here –

The results in Table 4 clearly corroborate our predictions and provide evidence consistent with a positive effect of CEO fitness on firm value. The regression coefficients of our main variable of interest, *Fit CEO*, are significantly positive for CEOs with above median age (at the 5% level), for CEOs with above median tenure (at the 1%-level), and for CEOs with a high workload (at the 5%-level). The coefficients are also highly significant in terms of their economic relevance. Firm value is between 8% and 10% higher if the variable *Fit CEO* assumes the value of one, taking the effects of all control variables into account. That means, relative to the economic effect found in the full sample in Section 3.1 (an average increase in Tobin's Q of 4.6%), the economic effect is about twice as large in the all three subsamples. Thus, fitness appears to be an economically important CEO attribute, particularly if firms are run by older CEOs, those who have held the position for several years, and those with high workload and stress. The findings from this section present important channels that help us understand why CEO fitness is relevant.

### **3.3 Robustness: identification and alternative explanations**

In the following, we deal with the robustness the previous results. In Section 4.1, we address the issue of unobserved CEO heterogeneity that plays an important role in our study. Section 4.2 considers several other alternative explanations.

### 3.3.1 Unobserved CEO heterogeneity

One important concern when dealing with CEO characteristics and firm outcomes such as performance is unobservable time-invariant CEO heterogeneity. In the context of our study, it is possible that CEOs who finish marathons differ from CEOs who do not. For example, they could generally be more talented or ambitious or they could have an athletic or military pedigree and a higher level of discipline (enabling them to do both, run marathons and successfully manage their firms). Thus, our variable *Fit CEO* may simply capture such unobserved CEO heterogeneity instead of measuring CEOs' actual fitness.

An advantage of our study is that we can account for such unobserved time-invariant CEO heterogeneity because our measure of CEO fitness is time-variant. That means we can exploit observable variation in our main variable of interest, *Fit CEO*, over the same CEOs. Therefore, we rerun the regressions shown in Section 3.1 and 3.2 using CEO-firm fixed effects. As long as the matching between CEOs and firms is based on time-invariant unobservable CEO and firm characteristics, this method also addresses a potential endogenous matching between firms and (fit) CEOs (see, e.g., Custódio and Metzger (2014), and Bertrand and Schoar (2003)). The results of these regressions are shown in Table 5.<sup>10</sup>

– Please insert TABLE 5 approximately here –

As can be seen from Table 5, our main results do not change when use CEO-firm effects instead of firm-fixed effects (as done in Section 3). In fact, the results remain significant, both statistically and economically. The *Fit CEO* dummy is positive and significant at the 10% level in the full sample regression shown in specification (1) and at the 5% level in all of the three subsamples where we expect particularly strong effects of CEO fitness on firm value (see specifications (3), (5) and (6)). The economic magnitude of CEO

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<sup>10</sup> Regressions are run with standard errors clustered at the firm level. As a robustness check, we alternatively cluster standard errors at the CEO-firm level in unreported regressions. The results are similar. As we use CEO-firm fixed effects, the indicator variable Founder CEO is excluded.



fitness remains meaningful as well. Firm value is about 4% higher in the full sample and between 8% and 9% in the subsamples. Consequently, we conclude that our results are not driven by unobserved time-invariant CEO heterogeneity.

### **3.3.2 Alternative explanations based on time-variant firm-specific heterogeneity**

In this section, we address alternative explanations based on time-varying firm characteristics. First, reverse causality might lead us to draw the false conclusion that CEO fitness positively affects firm value. In particular, it is possible that CEOs have less pressure to perform and find more time to run marathons if past firm performance, a potential driver of current firm performance, was good. If this is the case, the variable *Fit CEO* would simply capture good past performance and we might just document the positive effect of past on current performance. Although we control for past operating performance (by including operating cash flow) in all regressions, this accounting-based performance measure may only weakly capture past stock market performance. Therefore, in this section we additionally control lagged Tobin's Q.

Second, as shown in Table 2, fit CEOs are more prevalent among smaller firms. Smaller firms, in turn, tend to have higher sales growth rates which have been shown to positively affect stock market performance (see, e.g., Brush, Bromiley, and Hendrickx (2000)). The variable *Fit CEO* may hence capture the effect of higher sales growth on Tobin's Q. To address this issue, we additionally control for sales growth in this section.

Third, the variable *Fit CEO* might measure the effect of industry competition on firm performance. On the one hand, CEOs may have more time to run (and less pressure to perform) if competition is low. On the other hand, one may argue that CEOs have more need to care for their fitness and engage in activities that help them perform on a high level each

day if they have to face high industry competition. The latter has been shown to have a positive effect on corporate performance (Nickell (1996)). Additionally, Giroud and Mueller (2011) find that firms with weak corporate governance are associated with lower firm value only in industries with low competition. Yet, the literature on the effects of competition is not unambiguous and it is also possible that firms in low-competition industries have higher firm values, for example as they are able to sell products at higher prices and margins. To address the potential effect of competition on CEO fitness and firm value, we additionally control for industry competition in this section.

To account for the aforementioned alternative explanations, we rerun our regressions from Section 3.1 and 3.2 and include the variables Tobin's Q lagged, Sales growth and Competition.<sup>11</sup> Results are provided in Table 6. For brevity, we only report the regression coefficients for the variable *Fit CEO* and the newly added controls. In Panel A of Table 6, we show regression results using firm fixed effects. Panel B reports the results for CEO-firm fixed effects.

– Please insert TABLE 6 approximately here –

As can be seen from both Panel A and Panel B of Table 6, our main result does not change: the coefficient of *Fit CEO* remains statistically significant in all regressions. Importantly, compared to the results shown in Section 3, the economic significance of CEO fitness does not considerably change. Firm value is almost 4% higher in the full sample and between 8% and 9% in the subsamples if CEOs are fit. In terms of our additional control variables, we find that Tobin's Q lagged and Sales growth have significantly positive effects on Tobin's Q, as expected. In line with the rather ambiguous effect of industry competition on

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<sup>11</sup> The variables are defined in Appendix B. We measure industry competition on annual basis using the Herfindahl index of sales-based market share over all Compustat firms within the same two-digit SIC industries.

firm value, we find that the coefficient of the variable Competition switches signs and is insignificant in most regression specifications.

#### **4 CEO fitness and firm value: evidence from large corporate investments**

So far we have focused on the relation between CEO fitness and firm value measured by Tobin's Q. In this section, we provide additional micro-level evidence to better understand this relation. Therefore, we examine the role of CEO fitness in mergers and acquisitions, which typically represent the largest investments that firms undertake. As such they tend to have an immediate impact on shareholder wealth (see Betton, Eckbo, and Thorburn (2008)).

The market for mergers and acquisitions (M&As) constitutes an optimal laboratory for our study as CEO fitness should be highly relevant in complex and risky transactions. M&As of that kind particularly involve bids for large, public and cross-border targets. They are characterized by stressful, work-intensive and uncertain processes, in particular deal negotiation and post merger integration (PMI), which bear considerable risks of deal failure. Bids for public targets are typically associated with tough, lengthy negotiations (e.g., Officer (2007)) and strong media scrutiny (Liu and McConnell (2013)), while cross-border deals are typically characterized by cultural and governance-related differences across firms and countries (Erel, Liao, and Weisbach (2012)). The latter necessitate more coordination and travelling by executives during the bidding and integration process. These aspects typically also characterize large M&A deals. Furthermore, bids for large and cross-border targets constitute far-reaching investment decisions that cannot easily be reversed. In fact, they often times lead to significant reorganizations including plant closures and layoffs.

As suggested above, M&As including large, public and cross-border targets tend to be among the most stressful corporate actions for CEOs. As the firms' leaders, CEOs have to

carry the burden of being responsible for the entire company (including the target firm) and are exposed to increased scrutiny by the media and the involved firms' owners. As a consequence, CEOs are expected to perform while standing a high level of stress, often for a longer period of time. Due to the aforementioned reasons, the performance-enhancing and stress-buffering effects of fitness should be highly relevant for CEOs. Therefore, we expect bidding firms run by fit CEOs to be associated with significantly higher shareholder returns in bids for cross-border, public, and large targets.

To examine the effect of CEO fitness on shareholder returns we use a sample of 2,302 M&A transactions announced by our sample firms during the period 2001 to 2011. The M&A data is retrieved from the Standard and Poor's Capital IQ database. Our sample includes all M&A deals with a total transaction value of at least five million US dollars. Further, only bids for a majority (i.e., for at least 50%) of the target firm are included. The dependent variable in all regressions is the cumulative abnormal return around the merger announcement over the three-day event window, denoted as CAR [-1,1]. Our main independent variables are the *Fit CEO* indicator variable and, in particular, interaction terms of this variable with the deal characteristics of interest, i.e., cross-border, public target, and deal size. We use two variables for deal size. One variable is Relative Size defined as the ratio of the target's size (i.e., the transaction value) to the market value of the bidder. The other variable, Large Deal, is an indicator variable set to one if a deal's transaction value is in the top 25% percentile of the sample's distribution of transaction values. In line with our forgone reasoning, the coefficients of all interaction terms are expected to have a positive signs.

In the regressions, we use M&A-specific control variables in addition to the CEO, firm, and governance characteristics. We follow the existent M&A literature (e.g., Custódio and Metzger (2013), Fuller, Netter, and Stegemoller (2002), and Moeller, Schlingemann, and Stulz (2005)) and include controls for public and cross-border targets, for diversifying and

hostile deals, for the means of payment, and for the absolute and relative size of the transaction. All variable definitions directly follow the literature (see Table 7). We further include time and industry fixed effects. Regarding the latter, we use the Fama French classification of 48 industries. Standard errors are clustered at the acquirer level. Regression results are shown in Table 7.

– Please insert TABLE 7 approximately here –

The results in Table 7 provide strong support for the expected positive effect of CEO fitness on bidding firms' abnormal announcement returns in large and/or complex M&A transactions. The regression coefficients of all four interaction terms have a positive sign, as expected, and they are all statistically significant. Fit CEOs are associated with significantly higher abnormal announcement returns in bids for cross-border (10%-level) and public targets (1%-level) and in bids for large targets based on both relative (5%-level) and absolute (1%-level) target size. The magnitudes of the regression coefficients are economically significant. Abnormal returns are between 1.7 (for cross-border) and 3 (for public targets) percentage points larger in case large and/or complex M&A transactions are announced by firms that employ a fit CEO. For example, M&A bids for publicly targets, typically characterized by tough negotiations and management resistance, are generally associated with significantly negative abnormal bidder returns (see Custódio and Metzger (2013), and Moeller, Schlingemann, and Stulz (2005), among several other studies). Our results corroborate this finding. On average, abnormal returns are almost 1 percentage point lower (significant at the 1% level) if the target is public. However, if bids for public targets are announced by fit CEOs significantly positive abnormal returns can be observed.

In terms of our control variables, our findings are line with the studies named above. For example, similar to Fuller, Netter, and Stegemoller (2002) and Moeller, Schlingemann, and Stulz (2005) we find that relative deal size has a significantly positive effect on abnormal

announcement returns, while target size is insignificant. In line with Custódio and Metzger (2013), we find no effect of CEO age or tenure on abnormal returns.

Overall, our results contribute to the existing M&A literature as they further help to explain the heterogeneity in bidding firms' announcement returns. We provide evidence that fitness is an important CEO attribute in large and complex corporate investments and thereby identify another channel for the effect of CEO fitness on firm value.

## **5 Conclusion**

Despite the growing interest of economists in CEO attributes, the literature has remained relatively silent about physical aspects of CEOs. One reason is that data about CEOs' physical attributes is generally not available. In this study, we use hand-collected data on U.S. marathons to examine the role of CEO fitness. We classify CEOs as fit if they finish a marathon in a given year. Due to its buffering effect on stress and its positive effect on cognitive functions, executive control processes and job performance, fitness should play an important role for CEOs as their jobs are characterized by high, frequently changing demands, far-reaching decisions accompanied by media scrutiny, and high stress.

Using a panel of S&P 1500 companies over the period from 2001 to 2011 we provide evidence suggesting that fitness is an important CEO attribute. Firms run by fit CEOs have significantly higher firm values both on univariate and multivariate level. Regression results suggest that firm value is almost 5% higher on average. It is between 8% and 10% higher when CEOs' fitness is particularly important. Such cases include CEOs with above-median age and above-median tenure as well as CEOs with high workload. Our findings remain significant, both statistically and economically, when we address several alternative explanations including unobserved CEO heterogeneity. Finally, we show that abnormal

returns to announcements of large and complex M&A transactions are between 1.7 and 3 percentage points higher if the bidder employs a fit CEO.

Our findings explain the increasing importance of fitness in the managerial labor market and the recent trend for fitness among executives. For example, they provide a rationale for why executive recruiting firms look for physically fit candidates. Our results also suggest that corporate investments which help CEOs cope with the high demands and stress of their job, some of them might be (falsely) labeled as perquisites, may be valuable and thus in the interest of shareholders. Finally, we argue that our findings have general implications for executives (beyond the CEO) as fitness is likely to be highly relevant in jobs resembling that of the CEO, such as investment managers of large funds or lawyers.

## REFERENCES

- Adams, Renée B., Heitor Almeida, and Daniel Ferreira, 2005, Powerful CEOs and Their Impact on Corporate Performance, *Review of Financial Studies* 18, 1403-1432.
- Alam, Zinat S., Mark A. Chen, Conrad S. Ciccotello, and Harley E. Jr. Ryan, 2014, Does the Location of Directors Matter? Information Acquisition and Board Decisions, *Journal of Financial And Quantitative Analysis* 49, 131-164.
- Bebchuk, Lucian, Alma Cohen, and Allen Ferrell, 2009, What Matters in Corporate Governance?, *Review of Financial Studies* 22, 783-827.
- Benmelech, Efraim, and Carola Frydman, 2014, Military CEOs, *Journal of Financial Economics* (forthcoming).
- Bertrand, Marianne, 2009, CEOs, *Annual Review of Economics* 1, 121-150.
- Bertrand, Marianne, and Antoinette Schoar, 2003, Managing with Style: The Effect of Managers on Firm Policies, *The Quarterly Journal of Economics* 118, 1169-1208.
- Betton, Sandra, B. Espen Eckbo, and Karin S. Thorburn, 2008, Corporate Takeovers, in B.E. Eckbo, ed.: *Handbook of corporate finance: Empirical corporate finance* (Elsevier, North-Holland).
- Brown, Jonathan D., 1991, Staying fit and staying well: Physical fitness as a moderator of life stress, *Journal of Personality and Social Psychology* 60, 555-561.
- Brush, Thomas H., Philip Bromiley, and Margaretha Hendrickx, 2000, The free cash flow hypothesis for sales growth and firm performance, *Strategic Management Journal* 21, 455-472.
- Chatterjee, Arijit, and Donald C. Hambrick, 2007, It's All about Me: Narcissistic Chief Executive Officers and Their Effects on Company Strategy and Performance, *Administrative Science Quarterly* 52, 351-386.
- Coe, Dawn Podulka, James M. Pivarnik, Christopher J. Womack, Mathew J. Reeves, and Robert M. Malina, 2006, Effect of Physical Education and Activity Levels on Academic Achievement in Children, *Medicine & Science in Sports & Exercise* 38, 1515-1519.
- Colcombe, Stanley, and Arthur F. Kramer, 2003, Fitness Effects on the Cognitive Function of Older Adults: A Meta-Analytic Study, *Psychological Science* 14, 125-130.
- Cremers, Martijn, and Roberta Romano, 2011, Institutional Investors and Proxy Voting: The Impact of the 2003 Mutual Fund Voting Disclosure Regulation, *American Law and Economics Review* 13, 220-268.
- Custódio, Cláudia, Miguel A. Ferreira, and Pedro Matos, 2013, Generalists versus specialists: Lifetime work experience and chief executive officer pay, *Journal of Financial Economics* 108, 471-492.
- Custódio, Cláudia, and Daniel Metzger, 2013, How Do CEOs Matter? The Effect of Industry Expertise on Acquisition Returns, *Review of Financial Studies* 26, 2008-2047.
- Custódio, Cláudia, and Daniel Metzger, 2014, Financial expert CEOs: CEO's work experience and firm's financial policies, *Journal of Financial Economics* (forthcoming).
- Erel, Isil, Rose C. Liao, and Michael S. Weisbach, 2012, Determinants of Cross-Border Mergers and Acquisitions, *The Journal of Finance* 67, 1045-1082.
- Fahlenbrach, Rüdiger, 2009, Founder-CEOs, Investment Decisions, and Stock Market Performance, *Journal of Financial And Quantitative Analysis* 44, 439-466.
- Fich, Eliezer M., and Anil Shivdasani, 2006, Are Busy Boards Effective Monitors?, *The Journal of Finance* 61, 689-724.
- Fracassi, Cesare, and Geoffrey Tate, 2012, External Networking and Internal Firm Governance, *The Journal of Finance* 67, 153-194.

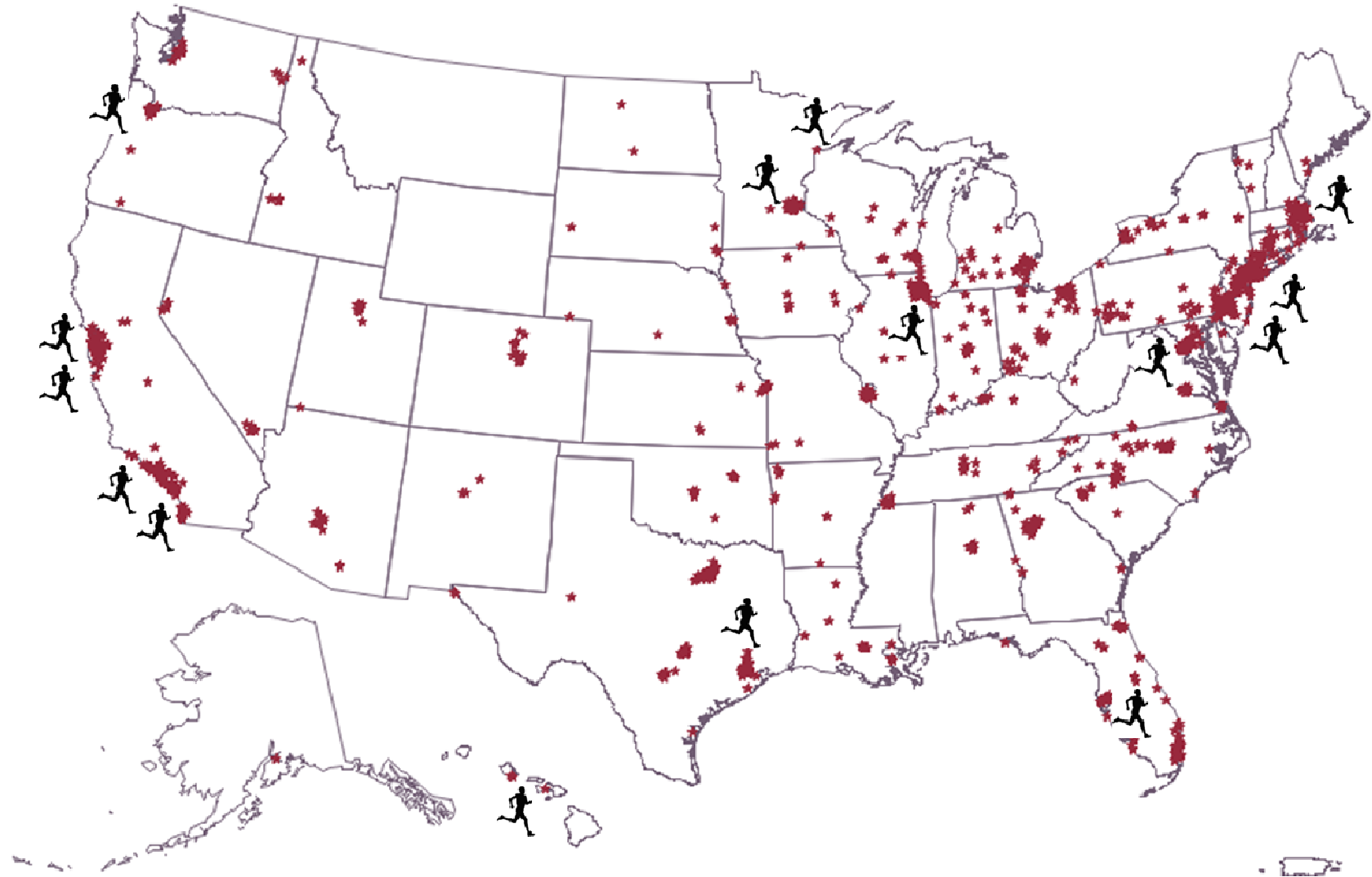


- Fuller, Kathleen, Jeffrey Netter, and Mike Stegemoller, 2002, What Do Returns to Acquiring Firms Tell Us? Evidence from Firms That Make Many Acquisitions, *The Journal of Finance* 57, 1763-1793.
- Gal, Reuven, and Richard S. Lazarus, 1975, The Role of Activity in Anticipating and Confronting Stressful Situations, *Journal of Human Stress* 1, 4-20.
- Giroud, Xavier, and Holger M. Mueller, 2011, Corporate Governance, Product Market Competition, and Equity Prices, *The Journal of Finance* 66, 563-600.
- Graham, John R., Campbell R. Harvey, and Manju Puri, 2014, A Corporate Beauty Contest, Working paper.
- Halford, Joseph T., and Scott H. C. Hsu, 2013, Beauty is Wealth: CEO Appearance and Shareholder Value, Working paper.
- Hambrick, Donald C., Sydney Finkelstein, and Ann C. Mooney, 2005, Executive Job Demands: New Insights for Explaining Strategic Decisions and Leader Behaviors, *The Academy of Management Review* 30, 472-491.
- Hoak, Amy, 2007, Executive endurance, Wall Street Journal MarketWatch.
- Kaplan, Steven N., Mark M. Klebanov, and Morten Sorensen, 2012, Which CEO Characteristics and Abilities Matter?, *The Journal of Finance* 67, 973-1007.
- Knayazeva, Anzhela, Diana Knayazeva, and Charu G. Raheja, 2013, The Benefits of Focus vs. Heterogeneity: Dissimilar Directors and Coordination within Corporate Boards, Working paper.
- Knudsen, Hannah K., Lori J. Ducharme, and Paul M. Roman, 2009, Turnover intention and emotional exhaustion "at the top": Adapting the job demands-resources model to leaders of addiction treatment organizations, *Journal of Occupational Health Psychology* 14, 84-95.
- Kramer, Arthur F., Sowon Hahn, Neal J. Cohen, Marie T. Banich, Edward McAuley, Catherine R. Harrison, Julie Chason, Eli Vakil, Lynn Bardell, Richard A. Boileau, and Angela Colcombe, 1999, Ageing, fitness and neurocognitive function, *Nature* 400, 418-419.
- Kwoh, Leslie, 2013, When Job Fatigue Hits the CEOs, Wall Street Journal.
- Lehn, Kenneth M., and Mengxin Zhao, 2006, CEO Turnover after Acquisitions: Are Bad Bidders Fired?, *The Journal of Finance* 61, 1759-1811.
- Li, Minwen, Yao Lu, and Gordon Phillips, 2014, CEOs and the Product Market: When are Powerful CEOs Beneficial?, Working paper.
- Li, Xiaoyang, Angie Low, and Anil K. Makhija, 2014, Career Concerns and the Busy Life of the Young CEO, Working paper.
- Liu, Baixiao, and John J. McConnell, 2013, The role of the media in corporate governance: Do the media influence managers' capital allocation decisions?, *Journal of Financial Economics* 110, 1-17.
- Lovelace, Kathi J., Charles C. Manz, and José C. Alves, 2007, Work stress and leadership development: The role of self-leadership, shared leadership, physical fitness and flow in managing demands and increasing job control, *Human Resource Management Review* 17, 374-387.
- Malmendier, Ulrike, Geoffrey Tate, and J. O. N. Yan, 2011, Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies, *The Journal of Finance* 66, 1687-1733.
- Moeller, Sara B., Frederik P. Schlingemann, and René M. Stulz, 2005, Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave, *The Journal of Finance* 60, 757-782.
- Nguyen, Bang Dang, and Kasper Meisner Nielsen, 2014, What Death Can Tell: Are Executives Paid for Their Contributions to Firm Value?, *Management Science* (forthcoming).

- Nickell, Stephen J., 1996, Competition and Corporate Performance, *Journal of Political Economy* 104, 724-746.
- Officer, Micah S., 2007, The price of corporate liquidity: Acquisition discounts for unlisted targets, *Journal of Financial Economics* 83, 571-598.
- Pan, Yihui, Tracy Yue Wang, and Michael S. Weisbach, 2013, CEO Investment Cycles, Working paper.
- Perry, Tod, and Urs Peyer, 2005, Board Seat Accumulation by Executives: A Shareholder's Perspective, *The Journal of Finance* 60, 2083-2123.
- Pirinsky, Christo, and Qinghai Wang, 2006, Does Corporate Headquarters Location Matter for Stock Returns?, *The Journal of Finance* 61, 1991-2015.
- Rhea, Matthew R., Brent A. Alvar, and Rayne Gray, 2004, Physical Fitness and Job Performance of Firefighters, *Journal of Strength and Conditioning Research* 18, 348-352.
- Rhodes, Matthew G., 2004, Age-Related Differences in Performance on the Wisconsin Card Sorting Test: A Meta-Analytic Review, *Psychology and Aging* 19, 482-494.
- Schaufeli, Wilmar B., and Arnold B. Bakker, 2004, Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study, *Journal of Organizational Behavior* 25, 293-315.
- Schoar, Antoinette, and Luo Zuo, 2011, Shaped by Booms and Busts: How the Economy Impacts CEO Careers and Management Styles, Working paper.
- Summers, Jeffery J., Greg I. Sargent, Amanda J. Levey, and Kevin D. Murray, 1982, Middle-aged, non-elite marathon runners: A profile, *Perceptual and Motor Skills* 54, 963-969.
- Taylor, Ronald N., 1975, Age and Experience as Determinants of Managerial Information Processing and Decision Making Performance, *The Academy of Management Journal* 18, 74-81.
- Unger, Jennifer B., C. Anderson Johnson, and Gary Marks, 1997, Functional decline in the elderly: Evidence for direct and stress-buffering protective effects of social interactions and physical activity, *Annals of Behavioral Medicine* 19, 152-160.
- Verhaeghen, Paul, and Timothy A. Salthouse, 1997, Meta-analyses of age-cognition relations in adulthood: Estimates of linear and nonlinear age effects and structural models, *Psychological Bulletin* 122, 231-249.
- Yim, Soojin, 2013, The acquisitiveness of youth: CEO age and acquisition behavior, *Journal of Financial Economics* 108, 250-273.

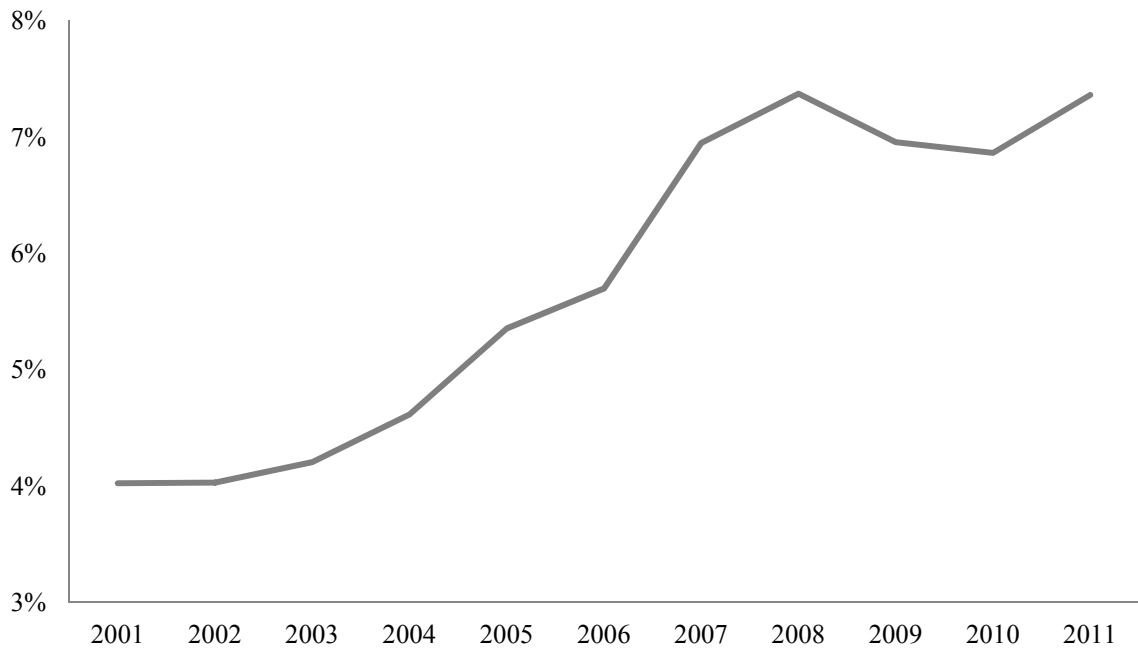
**Figure 1 – Company clusters and marathon locations**

This figure plots the geographical distribution of the S&P 1500 companies (based on zip codes) and the 15 largest U.S. marathons. Each red star marks a company's headquarter location. The runner symbol indicates the marathon's location. For an overview of the 15 largest U.S. marathons, see Table 1.



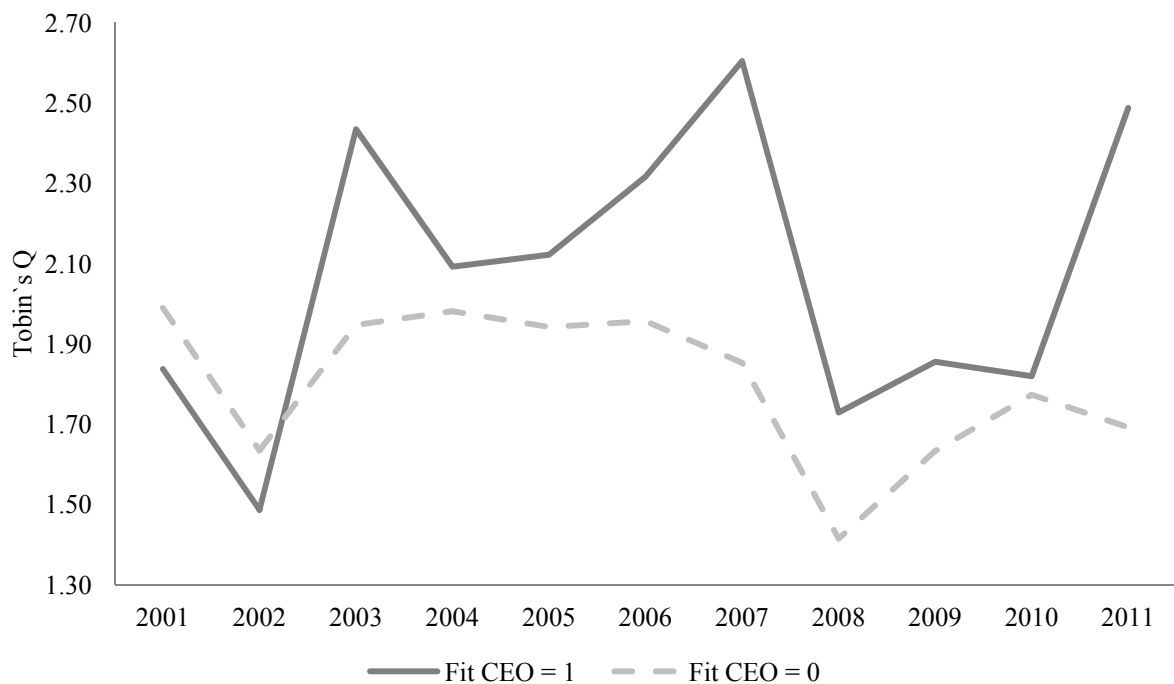
**Figure 2 – Fraction of CEOs identified as marathon runners over the sample period**

This figure shows the annual fraction of S&P 1500 CEOs identified as marathon finishers over the sample period 2001 to 2011.



**Figure 3 – CEO fitness and firm value**

This figure shows the annual mean *Tobin's Q* for firms with and without a *Fit CEO* for each year in the sample period 2001 to 2011. Variables are defined in Appendix B.



**Table 1 – Largest 15 U.S. marathons by number of finishers**

This table presents the fifteen largest marathons in the United States ranked by the number of finishers in the year 2011. Data about the number of marathon finishers in the U.S. is provided by [www.runningusa.org](http://www.runningusa.org).

	Name of marathon	Location	# finishers 2011	Avrg. # finishers 2001-2011
1	ING New York City	New York, NY	47,133	37,665
2	Bank of America Chicago	Chicago, IL	35,755	32,196
3	Boston	Boston, MA	23,913	19,193
4	Marine Corps	Washington, DC	21,042	18,604
5	Honda LA	Los Angeles, CA	19,902	21,121
6	Honolulu	Honolulu, HI	19,102	21,742
7	Walt Disney World	Orlando, FL	13,551	11,072
8	Philadelphia	Philadelphia, PA	10,267	6,927
9	Medtronic Twin Cities	St. Paul, MN	8,534	7,593
10	Portland	Portland, OR	8,461	7,424
11	Rock'n'Roll San Diego	San Diego, CA	8,290	14,467
12	Chevron Houston	Houston, TX	6,919	5,368
13	Grandma's	Duluth, MN	6,337	6,594
14	Nike Women's	San Francisco, CA	6,108	4,193
15	San Francisco	San Francisco, CA	5,989	3,948
$\Sigma$			243,859	218,107

**Table 2 – Summary statistics**

This table reports summary statistics (on firm-year level) for our full sample of S&P 1500 companies for the sample period 2001 to 2011 as well as for the subsamples as defined by CEO fitness. Mean and median differences for the subsamples of firms with and without a *Fit CEO* are reported. All variables are defined in the Appendix. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively, for the difference in means and medians between both subsamples (based on t-tests and Mann-Whitney-Wilcoxon rank-sum tests).

	Mean	p25	p50	p75	Std Dev	N	Mean			Median		
							Fit CEO = 1	Fit CEO = 0	Difference	Fit CEO = 1	Fit CEO = 0	Difference
<b><i>CEO characteristics:</i></b>												
CEO age	55.53	51.00	55.00	60.00	7.22	9,549	53.12	55.56	-2.44 ***	53.00	55.00	-2.00 ***
CEO tenure	11.30	5.00	9.00	16.00	9.05	9,549	11.32	9.98	1.34	8.00	9.00	-1.00
CEO duality	0.63	0.00	1.00	1.00	0.48	9,549	0.64	0.63	0.01	1.00	1.00	0.00
Founder CEO	0.08	0.00	0.00	0.00	0.27	9,549	0.04	0.08	-0.04	0.00	0.00	0.00
<b><i>Firm characteristics:</i></b>												
Tobin's Q	1.81	1.13	1.46	2.07	1.09	9,549	2.14	1.80	0.33 ***	1.53	1.46	0.07 *
Firm age	50.08	19.00	36.00	76.00	40.76	9,549	45.66	50.14	-4.48	34.00	36.00	-2.00
Firm size	7.84	6.63	7.69	8.91	1.66	9,549	7.34	7.85	-0.51 ***	7.18	7.70	-0.51 ***
Book leverage	0.21	0.06	0.20	0.33	0.18	9,549	0.21	0.21	-0.01	0.19	0.20	-0.01
R&D/sales	0.05	0.00	0.00	0.03	0.30	9,549	0.03	0.05	-0.02	0.00	0.00	0.00
CapEx/sales	0.07	0.02	0.03	0.07	0.14	9,549	0.10	0.07	0.03 **	0.03	0.03	0.00
Operating Cash flow	0.11	0.06	0.10	0.16	0.10	9,549	0.13	0.11	0.01	0.10	0.10	0.00
Business segments	2.90	1.00	3.00	4.00	2.14	9,549	2.82	2.91	-0.08	3.00	3.00	0.00
<b><i>Governance characteristics:</i></b>												
Boardsize	9.45	8.00	9.00	11.00	2.47	9,549	8.66	9.46	-0.80 ***	9.00	9.00	0.00 ***
% indep. directors	0.70	0.60	0.71	0.82	0.15	9,549	0.69	0.70	-0.01	0.70	0.71	-0.01
E-index	2.67	2.00	3.00	3.00	1.32	9,549	2.53	2.68	-0.15	2.00	3.00	-1.00
Institutional majority	0.81	1.00	1.00	1.00	0.39	9,549	0.77	0.81	-0.03	1.00	1.00	0.00

**Table 3 – CEO fitness and firm value: evidence from the full sample**

This table reports coefficients from firm fixed effects regression of the natural logarithm of Tobin's Q and Tobin's Q on the *Fit CEO* dummy and other control variables. All regression specifications include year fixed effects. Other control variables are defined as in the appendix. Robust t-values of the regression coefficients in parentheses are based on standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Ln(Tobin's Q) (1)	Tobin's Q (2)
<b>Fit CEO</b>	<b>0.0461**</b> <b>(2.067)</b>	<b>0.1440**</b> <b>(2.165)</b>
<i>CEO characteristics:</i>		
CEO age	0.0009 (0.822)	0.0027 (0.959)
CEO tenure	-0.0029 (-0.405)	-0.0081 (-0.442)
CEO duality	0.0092 (0.761)	0.0173 (0.482)
Founder CEO	-0.0323 (-1.220)	-0.0356 (-0.438)
<i>Firm characteristics:</i>		
Firm age	0.0275 (0.888)	0.0822 (1.104)
Firm size	-0.1707*** (-12.100)	-0.4278*** (-9.445)
Book leverage	-0.1052** (-2.158)	-0.2808* (-1.822)
R&D/sales	0.1148*** (19.333)	0.4763*** (15.253)
CapEx/sales	-0.0882 (-1.590)	-0.4127 (-1.169)
Operating Cash flow	0.4821*** (7.495)	1.1426*** (4.860)
Business segments	-0.0011 (-0.153)	-0.0087 (-0.520)
<i>Governance characteristics:</i>		
Boardsize	-0.0214 (-0.783)	-0.0739 (-1.008)
% indep. directors	-0.0033 (-0.132)	0.0118 (0.177)
E-index	-0.0151*** (-3.233)	-0.0301*** (-2.606)
Institutional majority	0.0322*** (3.442)	0.0472** (1.993)
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
NObs	9,549	9,549
Within R-Squared	0.288	0.223
Adj. R-Squared from LSDV	0.8475	0.8132

**Table 4 – CEO fitness and firm value: evidence from subsamples**

This table reports coefficients from firm fixed effects regression of the natural logarithm of Tobin's Q on the *Fit CEO* dummy and other control variables for different subsamples. All regression specifications include year fixed effects. Other control variables are defined as in the appendix. Robust t-values of the regression coefficients in parentheses are based on standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Dep. Var.:	CEO age		CEO tenure		High-workload CEO	
Ln(Tobin's Q)	≤ Median	> Median	≤ Median	> Median	1	0
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Fit CEO</b>	<b>0.0122</b>	<b>0.0822**</b>	<b>0.0105</b>	<b>0.0981***</b>	<b>0.0831**</b>	<b>0.0292</b>
	<b>(0.536)</b>	<b>(1.992)</b>	<b>(0.399)</b>	<b>(2.604)</b>	<b>(2.315)</b>	<b>(0.969)</b>
<i>CEO characteristics:</i>						
CEO age	0.0023	-0.0029	0.0012	0.0019	0.0007	-0.0011
	(0.963)	(-1.182)	(0.809)	(0.591)	(0.388)	(-0.771)
CEO tenure	0.0018	-0.0084	0.0040	-0.0108	0.0014	0.0039
	(0.164)	(-0.736)	(0.385)	(-0.253)	(0.105)	(0.377)
CEO duality	-0.0057	0.0387**	0.0136	-0.0072	0.0013	0.0184
	(-0.351)	(2.142)	(0.920)	(-0.327)	(0.068)	(1.094)
Founder CEO	-0.0630	-0.0402	-0.0262	-0.0723*	-0.0682	-0.0298
	(-1.466)	(-0.961)	(-0.252)	(-1.856)	(-1.266)	(-0.899)
<i>Firm characteristics:</i>						
Firm age	-0.0223	0.0866*	0.0659	-0.0030	0.0482	0.0186
	(-0.514)	(1.800)	(1.329)	(-0.100)	(1.267)	(0.355)
Firm size	-0.1758***	-0.1794***	-0.1630***	-0.1635***	-0.1771***	-0.1768***
	(-8.393)	(-8.284)	(-8.576)	(-6.735)	(-7.049)	(-9.947)
Book leverage	-0.0539	-0.1302*	-0.1233*	-0.1051	-0.0868	-0.0968
	(-0.712)	(-1.873)	(-1.775)	(-1.492)	(-1.255)	(-1.466)
R&D/sales	0.0927***	0.1251***	0.1031***	0.0113	0.0977*	0.1170***
	(10.297)	(16.715)	(23.022)	(0.260)	(1.696)	(21.768)
CapEx/sales	-0.0865	-0.1160	-0.0581	-0.1164	0.0382	-0.1783**
	(-1.205)	(-1.149)	(-0.681)	(-1.478)	(0.526)	(-2.216)
Operating Cash flow	0.4599***	0.3674***	0.4204***	0.4312***	0.3027***	0.5030***
	(5.245)	(3.700)	(4.783)	(4.713)	(2.969)	(6.550)
Business segments	-0.0132	0.0088	-0.0119	0.0068	-0.0006	-0.0084
	(-1.265)	(0.982)	(-1.248)	(0.635)	(-0.059)	(-0.838)
<i>Governance characteristics:</i>						
Boardsize	-0.0127	-0.0233	-0.0060	-0.0026	-0.0397	-0.0031
	(-0.344)	(-0.574)	(-0.162)	(-0.057)	(-1.017)	(-0.079)
% indep. directors	-0.0310	0.0122	0.0291	-0.0007	-0.0096	0.0076
	(-0.864)	(0.363)	(0.862)	(-0.019)	(-0.325)	(0.211)
E-index	-0.0074	-0.0231***	-0.0145**	-0.0190***	-0.0061	-0.0242***
	(-1.152)	(-3.323)	(-2.272)	(-2.601)	(-0.946)	(-3.562)
Institutional majority	0.0247*	0.0414***	0.0266**	0.0230	0.0324**	0.0243*
	(1.947)	(3.332)	(2.141)	(1.635)	(2.541)	(1.887)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
NObs	4,824	4,725	5,231	4,318	3,970	5,579
Within R-Squared	0.293	0.285	0.276	0.283	0.275	0.307



**Table 5 – Robustness I: CEO-firm fixed effects**

This table reports coefficients from CEO-firm fixed effects regression of the natural logarithm of Tobin's Q on the *Fit CEO* dummy and other control variables for the whole sample period (Column 1) and different subsamples (Column 2-7). All regression specifications include year fixed effects. Other control variables are defined as in the appendix. Robust t-values of the regression coefficients in parentheses are based on standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Dep. Var.:	CEO age		CEO tenure		High-workload CEO		
Ln(Tobin's Q)	Full sample	≤ Median	> Median	≤ Median	> Median	1	0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fit CEO</b>	<b>0.0421*</b>	<b>0.0116</b>	<b>0.0936***</b>	<b>0.0086</b>	<b>0.0785**</b>	<b>0.0818**</b>	<b>0.0248</b>
	<b>(1.944)</b>	<b>(0.569)</b>	<b>(2.357)</b>	<b>(0.413)</b>	<b>(2.060)</b>	<b>(2.013)</b>	<b>(0.983)</b>
<i>CEO characteristics:</i>							
CEO age	-0.0149***	-0.0067	-0.0255***	-0.0017	-0.0203***	-0.0082	-0.0214***
	(-4.219)	(-1.250)	(-4.318)	(-0.244)	(-3.060)	(-1.553)	(-4.045)
CEO tenure	0.0223	-0.0160	0.0758***	-0.0380*	0.1292	0.0002	0.0363
	(1.404)	(-0.757)	(2.773)	(-1.648)	(1.475)	(0.009)	(1.605)
CEO duality	-0.0087	0.0063	0.0068	0.0101	-0.0343	-0.0259	0.0060
	(-0.629)	(0.355)	(0.348)	(0.663)	(-1.299)	(-1.243)	(0.332)
<i>Firm characteristics:</i>							
Firm age	0.0154	-0.0299	0.0867	0.0147	0.0044	0.0136	-0.0088
	(0.505)	(-0.533)	(1.576)	(0.258)	(0.132)	(0.309)	(-0.220)
Firm size	-0.1755***	-0.1977***	-0.1849***	-0.1719***	-0.1694***	-0.1718***	-0.1783***
	(-11.457)	(-9.038)	(-7.316)	(-8.185)	(-7.099)	(-6.588)	(-8.694)
Book leverage	-0.0948*	-0.0230	-0.0893	-0.1131	-0.0588	-0.0241	-0.0806
	(-1.770)	(-0.296)	(-1.100)	(-1.469)	(-0.811)	(-0.325)	(-1.147)
R&D/sales	0.0817	0.0905	-0.0393	0.1022	0.0035	0.1149**	0.0667
	(1.378)	(1.302)	(-0.410)	(1.058)	(0.082)	(2.145)	(0.996)
CapEx/sales	-0.1271**	-0.1284	-0.2179**	-0.1316	-0.1126	-0.0101	-0.2297**
	(-2.116)	(-1.602)	(-2.113)	(-1.625)	(-1.451)	(-0.159)	(-2.449)
Operating Cash flow	0.2966***	0.3165***	0.2432**	0.1253	0.3905***	0.1457	0.3720***
	(4.792)	(3.615)	(2.516)	(1.626)	(4.369)	(1.574)	(4.948)
Business segments	0.0008	-0.0067	0.0048	-0.0086	0.0061	0.0018	-0.0042
	(0.115)	(-0.636)	(0.452)	(-0.888)	(0.601)	(0.155)	(-0.435)
<i>Governance characteristics:</i>							
Boardsize	-0.0077	-0.0005	-0.0124	-0.0019	-0.0029	-0.0513	0.0108
	(-0.278)	(-0.015)	(-0.269)	(-0.056)	(-0.063)	(-1.240)	(0.274)
% indep. directors	-0.0076	-0.0206	-0.0195	0.0320	-0.0237	0.0011	-0.0120
	(-0.312)	(-0.529)	(-0.597)	(0.989)	(-0.643)	(0.037)	(-0.333)
E-index	-0.0115**	-0.0032	-0.0178**	-0.0059	-0.0158**	-0.0042	-0.0200***
	(-2.393)	(-0.499)	(-2.227)	(-0.952)	(-2.090)	(-0.587)	(-2.891)
Institutional majority	0.0252***	0.0225*	0.0280**	0.0163	0.0254*	0.0364***	0.0115
	(2.666)	(1.716)	(2.078)	(1.408)	(1.759)	(2.751)	(0.879)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NObs	9,549	4,824	4,725	5,231	4,318	3,970	5,579
Within R-Squared	0.266	0.278	0.266	0.245	0.280	0.266	0.280

**Table 6 – Robustness II: alternative explanations based on time-variant firm-specific heterogeneity**

This table reports coefficients from firm fixed effects regression (Panel A) and CEO-firm fixed effects regression (Panel B) of the natural logarithm of Tobin's Q on the *Fit CEO* dummy and other control variables for the whole sample period (Column 1) and different subsamples (Column 2-7). All regression specifications include year fixed effects. For sake of brevity, we only report the coefficients for the *Fit CEO* dummy and the additional control variables. Other control variables are defined as in the appendix. Robust t-values of the regression coefficients in parentheses are based on standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

<b>Panel A: Firm fixed effects</b>							
Dep. Var.:	CEO age			CEO tenure		High-workload CEO	
Ln(Tobin's Q)	Full sample	≤ Median	> Median	≤ Median	> Median	1	0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fit CEO</b>	<b>0.0355*</b> (1.873)	<b>0.0054</b> (0.262)	<b>0.0808**</b> (2.178)	<b>0.0096</b> (0.447)	<b>0.0904**</b> (2.497)	<b>0.0850***</b> (2.681)	<b>0.0184</b> (0.735)
<i>Additional controls:</i>							
Tobin's Q <sub>t-1</sub>	0.1057*** (12.908)	0.0799*** (8.023)	0.1057*** (8.133)	0.1130*** (10.664)	0.0801*** (6.194)	0.0919*** (7.854)	0.0983*** (10.205)
Sales growth	0.0229*** (2.944)	0.0313** (2.501)	0.0192** (2.056)	0.0152 (1.608)	0.0288*** (2.861)	0.0108 (1.364)	0.0330** (2.477)
Competition	0.0465 (0.523)	-0.0457 (-0.288)	0.1549 (1.416)	0.0524 (0.566)	0.0024 (0.013)	-0.2445 (-1.293)	0.2902*** (3.116)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nobs	9,515	4,803	4,712	5,211	4,304	3,955	5,560
Within R-Squared	0.369	0.349	0.358	0.364	0.333	0.350	0.377
<b>Panel B: CEO-firm fixed effects</b>							
Dep. Var.:	CEO age			CEO tenure		High-workload CEO	
Ln(Tobin's Q)	Full sample	≤ Median	> Median	≤ Median	> Median	1	0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fit CEO</b>	<b>0.0360*</b> (1.814)	<b>0.0024</b> (0.125)	<b>0.0926**</b> (2.491)	<b>0.0092</b> (0.459)	<b>0.0747**</b> (2.060)	<b>0.0815**</b> (2.186)	<b>0.0143</b> (0.635)
<i>Additional controls:</i>							
Tobin's Q <sub>t-1</sub>	0.0784*** (9.663)	0.0632*** (6.068)	0.0830*** (6.185)	0.0792*** (7.422)	0.0676*** (5.370)	0.0748*** (6.637)	0.0699*** (6.848)
Sales growth	0.0247*** (3.003)	0.0402** (2.563)	0.0227** (2.575)	0.0176 (1.391)	0.0271*** (2.694)	0.0146 (1.596)	0.0365** (2.393)
Competition	0.0991 (0.949)	-0.1722 (-0.976)	0.1993 (1.636)	0.0411 (0.346)	0.1620 (0.887)	-0.3914* (-1.807)	0.4329*** (4.412)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nobs	9,515	4,803	4,712	5,211	4,304	3,955	5,560
Within R-Squared	0.317	0.317	0.317	0.292	0.318	0.320	0.325

## Table 7 – CEO fitness and firm value: evidence from mergers and acquisitions

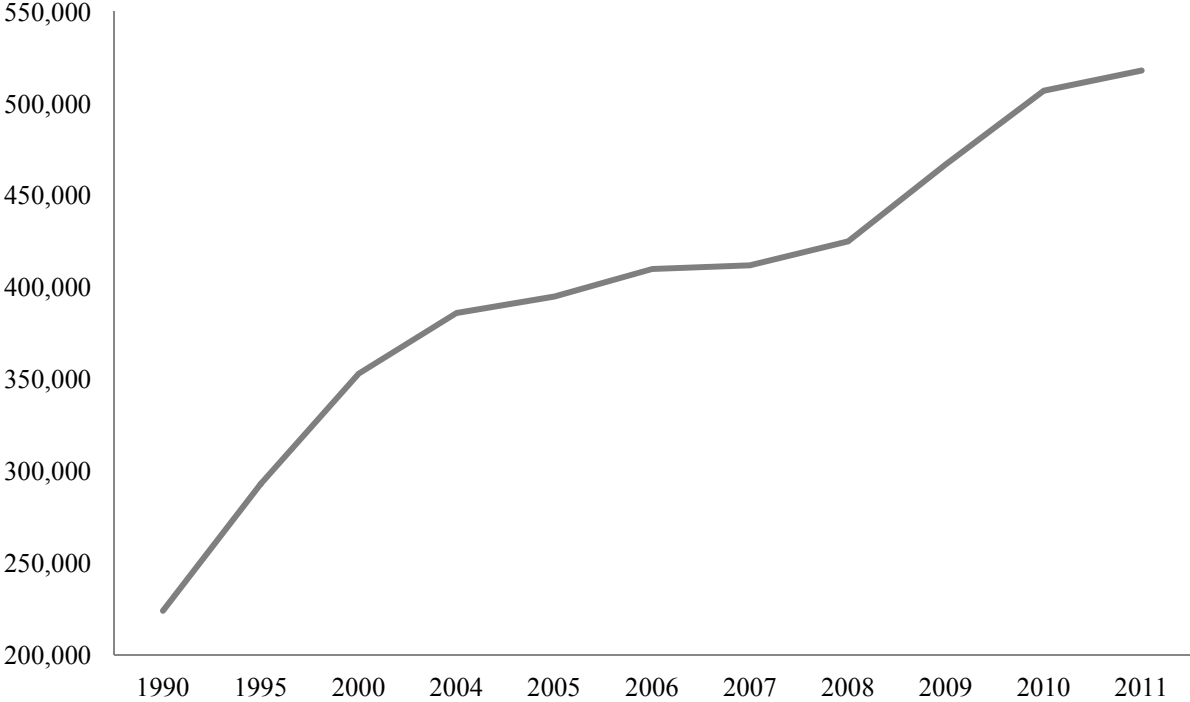
This table reports coefficients from regressions of cumulative abnormal returns around the announcement of mergers and acquisitions (M&As) over the three-day event window (CAR [-1,1]) on the *Fit CEO* dummy, other control variables and interaction terms between the *Fit CEO* dummy and various deal characteristics. *CAR[-1,1]* is the cumulative abnormal return around the merger announcement over the three-day event window. CARs are estimated using the market-model event study approach with an estimation window of 200 trading days ending 21 trading days before the announcement of the deal. Total return stock data (adjusted for stock splits etc.) is used. The S&P 500 stock index is used as the market portfolio. *Public target* is dummy variable that equals one if the target firm is a listed company, zero otherwise. *Relative size* is the deal's total transaction value divided by the acquirer's market capitalization 20 days prior to the announcement of the deal. *Transaction Value* is the natural logarithm of the total transaction value. *Large deal* is a dummy variable that is set to one if a deal's transaction value is in the top 25% percentile of the sample's distribution of transaction values, zero otherwise. *Payment includes stock* is a dummy variable (regarding the acquirer's chosen method of payment) that equals one for deals in which the consideration includes some stock, zero otherwise. *Cross-border* is a dummy variable that is set to one if the deal is a cross-border deal, zero for domestic deals. *Same industry* is a dummy variable that equals one if the acquirer and the target belong to the same two-digit SIC industry, zero otherwise. *Hostile* is a dummy variable that is set to one for deals defined as hostile deals, zero otherwise. *MTB* is the acquiring firm's market-to-book ratio defined as the acquirer's market capitalization 20 trading days prior to deal announcement divided by the acquirer's common equity as of the end of the fiscal year prior the announcement of the M&A deal. All regression specifications include year fixed effects and industry fixed effects using Fama-French 48 industry dummies. Other control variables are defined as in the appendix. Robust t-statistics of the regression coefficients (in parentheses) are based on standard errors clustered by acquirer. \*\*\*, \*\*, and \* denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	CAR [-1,1]				
	(1)	(2)	(3)	(4)	(5)
Fit CEO	0.0032 (0.497)	-0.0014 (-0.186)	-0.0017 (-0.224)	-0.0154 (-1.391)	-0.0034 (-0.461)
<i>Interaction terms:</i>					
Fit CEO * Public target		<b>0.0304*** (3.302)</b>			
Fit CEO * Cross-border			<b>0.0169* (1.773)</b>		
Fit CEO * Relative size				<b>0.7397** (2.511)</b>	
Fit CEO * Large deal					<b>0.0288*** (3.073)</b>
<i>Deal characteristics:</i>					
Public target	-0.0090*** (-3.006)	-0.0092*** (-3.040)	-0.0091*** (-3.017)	-0.0091*** (-3.022)	-0.0088*** (-2.844)
Relative size	0.0205** (2.182)	0.0206** (2.188)	0.0205** (2.183)	0.0206** (2.194)	0.0210** (2.375)
Transaction value	-0.0007 (-0.365)	-0.0007 (-0.369)	-0.0007 (-0.363)	-0.0008 (-0.407)	
Large deal					-0.0024 (-0.803)
Payment includes stock	-0.0027 (-0.653)	-0.0026 (-0.642)	-0.0027 (-0.654)	-0.0027 (-0.648)	-0.0027 (-0.647)
Cross-border	-0.0008 (-0.364)	-0.0009 (-0.378)	-0.0010 (-0.420)	-0.0009 (-0.384)	-0.0008 (-0.333)
Same industry	-0.0001 (-0.024)	-0.0001 (-0.026)	-0.0001 (-0.026)	-0.0000 (-0.013)	-0.0000 (-0.004)
Hostile	-0.0047 (-0.193)	-0.0046 (-0.192)	-0.0046 (-0.188)	-0.0047 (-0.192)	-0.0048 (-0.200)
<i>Firm characteristics:</i>					
Firm size	-0.0013 (-1.324)	-0.0012 (-1.295)	-0.0012 (-1.312)	-0.0012 (-1.301)	-0.0012 (-1.290)
Book leverage	-0.0021 (-0.288)	-0.0020 (-0.271)	-0.0021 (-0.286)	-0.0022 (-0.297)	-0.0023 (-0.315)
Operating Cash flow	0.0327** (2.318)	0.0326** (2.313)	0.0327** (2.319)	0.0328** (2.326)	0.0326** (2.327)
MTB	0.0004 (1.522)	0.0004 (1.506)	0.0004 (1.522)	0.0004 (1.526)	0.0004 (1.546)
<i>CEO characteristics:</i>					
CEO age	0.0001 (0.336)	0.0001 (0.348)	0.0001 (0.353)	0.0001 (0.365)	0.0001 (0.345)
CEO tenure	-0.0026 (-1.435)	-0.0026 (-1.456)	-0.0026 (-1.455)	-0.0027 (-1.475)	-0.0026 (-1.452)
CEO duality	0.0019 (0.851)	0.0019 (0.851)	0.0019 (0.868)	0.0019 (0.879)	0.0019 (0.852)
Founder CEO	0.0037 (0.803)	0.0037 (0.812)	0.0037 (0.815)	0.0037 (0.812)	0.0036 (0.795)
<i>Governance characteristics:</i>					
Boardsize	0.0027 (0.487)	0.0025 (0.453)	0.0027 (0.483)	0.0027 (0.480)	0.0016* (1.712)
% indep. directors	-0.0087 (-0.945)	-0.0087 (-0.945)	-0.0086 (-0.938)	-0.0086 (-0.938)	0.0026 (0.473)
E-index	0.0016* (1.708)	0.0016* (1.693)	0.0016* (1.713)	0.0016* (1.706)	0.0030 (1.003)
Institutional majority	0.0031 (1.042)	0.0031 (1.042)	0.0032 (1.057)	0.0031 (1.038)	-0.0086 (-0.931)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
NObs	2,302	2,302	2,302	2,302	2,302
Adj.R-Squared	0.062	0.063	0.063	0.063	0.063

**Appendix**

**Appendix A: Number of marathon finishers in the United States**

This figure shows the number of marathon finishers in the United States between 1990 and 2011. Data about the estimated number of marathon finishers in the U.S. is provided by [www.runningusa.org](http://www.runningusa.org). Data on annual basis is provided from 2004 on.



## Appendix B: Variable definitions

Variable	Definition
% ind. directors	Percentage of directors on the board classified as independent directors. (Source: <i>The Corporate Library</i> )
Boardsize	Natural logarithm of the number of directors on the firm's board of directors. (Source: <i>The Corporate Library</i> )
Book Leverage	(Long-term debt + current liabilities) <sub>t-1</sub> / Total assets <sub>t-1</sub> . (Source: <i>Compustat</i> )
Business segments	Natural logarithm of the number of business segments. (Source: <i>Compustat Segments</i> )
CapEx	Capital expenditures <sub>t-1</sub> / Sales <sub>t-1</sub> . (Source: <i>Compustat</i> )
CEO age	Age of the firm's CEO in years (Source: <i>The Corporate Library</i> )
CEO tenure	Natural logarithm of the number of years of service of the firm's CEO. (Source: <i>The Corporate Library</i> )
Competition	Herfindahl index of sales (on annual basis) for all firms in the Compustat universe that belong to the same 2-digit SIC industry. (Source: <i>Compustat</i> )
Duality	Indicator variable equals one if the CEO is also the chairman of the board, zero otherwise. (Source: <i>The Corporate Library</i> )
E-Index	The Bebchuk, Cohen, Ferrell (2009) entrenchment index of six IRRC provisions. (Source: <i>RiskMetrics</i> )
Firm age	Natural logarithm of the number of years the company has been in business (i.e., the firm's foundation age). (Source: <i>The Corporate Library</i> )
Firm size	Natural logarithm of total assets <sub>t-1</sub> . (Source: <i>Compustat</i> )
Fit CEO	Indicator variable equals one if a CEO finishes a marathon in a given year, zero otherwise. (Source: <i>official marathon websites and www.marathonguide.com</i> )
Founder CEO	Indicator variable equals one if the CEO is the founder of the company, zero otherwise. (Source: <i>The Corporate Library</i> )
High-workload CEO	Defined as CEOs with two or more outside board seats, zero otherwise. The definition follows Fich and Shivdasani (2006). (Source: <i>The Corporate Library</i> )
Institutional majority	Indicator variable equals one if the majority of a firm's outstanding shares is held by institutions, zero otherwise. (Source: <i>The Corporate Library</i> . The variable is available for the years 2003 and later; the dummy for the years 2001 and 2002 is created using the variable 'InstitutionPctg' reported in <i>The Corporate Library</i> .)
Operating cash flow	Annual cash flow from operations <sub>t-1</sub> / Total assets <sub>t-1</sub> . (Source: <i>Compustat</i> )
R&D	R&D expense <sub>t-1</sub> / Sales <sub>t-1</sub> . (Source: <i>Compustat</i> )
Sales growth	Annual change in net sales divided by previous year's net sales: Sales <sub>t</sub> / Sales <sub>t-1</sub> - 1. (Source: <i>Compustat</i> )
Tobin's Q	Tobin's Q is defined as: (Total assets - Book equity + Market value of equity) / Total assets. (Source: <i>Compustat</i> )