

## CEO managerial ability and the marginal value of cash



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### ABSTRACT

This study examines whether the managerial ability of a chief executive officer (CEO) is associated with a marginal value of cash. We predict that more talented CEOs make better use of cash, creating the marginal value of cash. Using the managerial ability measures of Demerjian et al. (2012) and the cash value model developed by Faulkender and Wang (2006), we find that CEO managerial ability significantly increases the marginal value of cash. We also find that the effect of managerial ability on the marginal value of cash is generally greater for financially constrained firms. We further show that the positive impact of managerial ability on the marginal value of cash is more evident for firms with higher levels of free cash flows and lower management entrenchment. Overall, our findings suggest that the market places a higher value on cash if the cash is managed by more able CEOs, which is consistent with the view that shareholders consider the ability of a CEO when they evaluate cash.

### 1. Introduction

In this study, we examine whether a firm's marginal value of cash can be attributed to the firm's CEO's managerial ability. This study is motivated by the following. Cash is an important source of internal capital that is under the control of CEOs. That is, decisions about how to deploy cash are at the managers' discretion (Liu & Mauer, 2011). A firm's survival generally depends upon how effectively the firm manages its cash. Consistent with this view, a stream of research (e.g., Fazzari, Hubbard, & Petersen, 1988; Jensen, 1986; Pinkowitz & Williamson, 2004) shows that the value of cash depends on its availability and on how CEOs use it. In particular, Jensen (1986) argues that the individual characteristics of CEOs, such as personal interests and incentives, affect utilization of cash because available cash is under CEOs' control. He also claims that managers may abuse their managerial discretion over the use of cash to pursue their own interests when the firm has a high level of cash. In particular, existing theoretical studies (e.g., Faulkender & Wang, 2006; Jensen, 1986; Myers & Majluf, 1984) suggest that a dollar of cash held by a firm may be valued at more than a dollar by its shareholders. For instance, Faulkender and Wang (2006) show that the marginal value of cash declines as cash reserves increase. Overall, prior evidence suggests that the marginal value of cash can be significantly influenced by CEOs' ability. It is therefore critical for shareholders and investors to investigate how effectively managers utilize cash to maximize the marginal value of cash. Nonetheless, there is little research on the association between the marginal

value of cash and managerial ability.

Numerous studies (e.g., Baik, Farber, & Lee, 2011; Banker, Darrrough, Huang, & Plehn-Dujowich, 2013; Carter, Franco, & Tuna, 2010; Chang, Dasgupta, & Hilary, 2010; Goodman, Neamtiu, Shroff, & White, 2013; Harris & Holmstrom, 1982; Jian & Lee, 2011; Rajgopal, Shevlin, & Zamora, 2006; Trueman, 1986) report that more able CEOs better manage a firm's business operations, thereby enhancing the firm's performance. In their theoretical work, Harris and Holmstrom (1982) argue that firms observe and assess a manager's ability and the manager's output over time and that a more experienced and high-ability manager's productivity is perceived to be high. Recently, Demerjian, Lev, and McVay (2012) show that more able CEOs are expected to deliver a higher marginal outcome from the same level of resources, thereby enhancing the value of the firm. Accordingly, the marginal value of \$1 of cash may not be valued at \$1 by investors for various reasons, including managerial ability if high-quality CEOs generate a higher rate of output from given inputs than lower-quality CEOs (Demerjian et al., 2012). Thus, we argue that the marginal value of cash is impacted by management talents and should be higher than \$1 if the cash is managed by more able managers.

Using the managerial ability scores and rankings developed by Demerjian et al. (2012), we find that CEO managerial ability is positively associated with the marginal value of cash. This finding is further substantiated by sub-sample analysis of financially constrained and unconstrained firms. The marginal value of cash is generally lower if firms are financially unconstrained, because value-increasing

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investments can easily be funded through external capital, and cash is not an urgent need (e.g., Faulkender & Wang, 2006; Fazzari et al., 1988; Myers & Majluf, 1984). Our results also show that the effect of managerial ability on the marginal value of cash tends to be greater for firms that are especially financially constrained. We further find that a firm's free cash flows matter in our research context. Specifically, we provide evidence that the positive impact of managerial ability on the marginal value of cash is more evident in firms with a high level of free cash flows, which indicates that managerial ability matters most in settings in which managerial discretion is highest. Finally, we find that the positive impact of managerial ability on cash value is more pronounced for firms with lower management entrenchment.

This study makes two important contributions to the accounting and finance literature on managerial ability and the value of cash holdings. First, our study sheds light on how CEOs' individual characteristics affect the marginal value of cash holdings. Prior studies suggest that CEOs' capabilities significantly contribute to improved financial outcomes and high information quality (e.g., Baik et al., 2011; Banker et al., 2013; Carter et al., 2010; Chang et al., 2010; Demerjian, Lev, Lewis, & McVay, 2013; Harris & Holmstrom, 1982; Rajgopal et al., 2006). By extending Faulkender and Wang (2006), we provide evidence that management talent positively impacts the marginal value of cash. This enhances our understanding of the association between CEO managerial ability and the marginal value of internal capital. Second, existing literature (e.g., Milbourn, 2003; Graham, Li, and Qiu 2012; Banker et al., 2013) uses several measures (e.g., reputation, firm size, past abnormal performance, media exposure, or manager fixed effects) as proxies for managerial ability. These measures, however, are less precise because they reflect significant aspects of the firm that are outside of management's control (Demerjian et al., 2012). Unlike these studies, we use direct and more precise measures of managerial ability, which capture manager-specific aspects of managerial ability with respect to the marginal value of cash<sup>1</sup>.

The remainder of this paper is organized as follows. In the next section, we discuss previous literature and develop our hypothesis. We discuss the research design in Section 3 and the empirical results in Section 4. Section 5 discusses additional analyses. We conclude the paper in Section 6.

## 2. Literature review and hypothesis development

### 2.1. Managerial ability

Business research has long focused on managerial ability and how individual variations in managerial talent have an incremental power to explain the variable levels of corporate decision quality, diverse firm practices, and economic outcomes.

Prior studies, driven by different research needs, use various proxies to indicate managerial ability. One stream of prior literature argues that prior firm-level performance and compensation levels can indicate CEOs' managerial ability. According to Harris and Holmstrom's (1982) dynamic model of efficient wage contracts, managers work on the firm's behalf and generate observable output, through which firms can learn about a manager's ability over time. This theoretical argument has also been supported by empirical evidence of a positive association between managerial characteristics and firm performance (e.g., Baik et al., 2011; Banker et al., 2013; Carter et al., 2010; Chang et al., 2010; Rajgopal et al., 2006). For instance, using firm performance and compensation levels as proxies, Chang et al. (2010) show that the stock market reaction to CEO turnover is negatively associated with the firm's previous performance and the CEO's pay, and that better prior firm performance and higher CEO pay lead to a better subsequent labor market for the

<sup>1</sup> Demerjian et al. (2012) show that their ability measures outperform the existing measures, including past abnormal performance, CEO tenure, and media mentions.

CEO.

Reputation is another popular proxy for managerial talent (e.g., Baik et al., 2011; Francis, Huang, Rajgopal, & Zang, 2008; Milbourn, 2003 and Rajgopal et al., 2006), where CEO reputation is typically measured by the number of articles in the public press containing a CEO's name. For example, Milbourn (2003) develops a model and empirically tests the prediction that CEO reputation is positively related to stock-based pay sensitivities. Francis et al. (2008) find a negative association between highly reputed CEOs and lower discretionary accruals, indicating that CEO reputation has a positive impact on earnings quality. Baik et al. (2011) find that the frequency of issuing management earnings forecast increases with CEO ability and that the market reacts more favorably to management forecasts released by high-ability CEOs than to those released by relatively low-ability CEOs, implying that higher-ability CEOs transmit not only more information but also higher-quality information to the market than do low-ability CEOs. Last but not least, Goodman et al. (2013) use the quality of managers' externally reported earnings forecasts as a proxy for management ability and show that managers' ability is positively related to the quality of their corporate investment decisions.

While the proxies discussed above are warranted with respect to their research purposes, there are still questions and concerns as to whether these measures are exhaustive, whether they fully consider managerial-specific effects, and whether their evaluation of managerial-specific effects is contaminated by firm-specific effects (Demerjian et al., 2012). In response to these concerns, Demerjian et al. (2012) develop a method to capture managerial ability in a more comprehensive way by partitioning total efficiency into firm-level and individual manager-level efficiency. The managerial ability measure in Demerjian et al. (2012) reflects managers' efficiency compared to that of their industry peers in transforming corporate resources to revenues. They then separate firm-level efficiency from managerial-level efficiency, which results in CEO managerial ability. Demerjian et al. (2012) confirm the validity of this measure of managerial ability and demonstrate that it contains less noise and better captures the manager-specific component of ability<sup>2</sup>.

The managerial ability measure developed by Demerjian et al. (2012) has been adopted by other studies. For example, Demerjian et al. (2013) shows that earnings quality positively relates to managerial ability using the measure introduced by Demerjian et al. (2012). Baik et al. (2011), using the same measure of managerial ability, find that their results are consistent across three measures of managerial ability. Krishnan and Wang (2015) corroborate that audit fees and the likelihood of issuing a going concern opinion are decreasing in managerial ability. Finally, Gan and Park (2016) show that the pay-for-performance sensitivity of a CEO's equity-based compensation is significantly increasing in the CEO's ability.

### 2.2. The marginal value of cash

In their theoretical study, Myers and Majluf (1984) suggest that a dollar of cash held by a firm may be valued at more than a dollar by its shareholders. In a similar vein, Faulkender and Wang (2006) show that if firms have high external capital costs, then additional cash may be valued more. The marginal value of cash in a firm is affected by several factors, such as managerial ability, external capital costs, financial

<sup>2</sup> As discussed in Demerjian et al. (2012), however, the managerial ability measures have some limitations. For instance, measurement errors are unavoidable in some accounting variables that are used to estimate firms' efficiency scores. In addition, the first stage data envelopment analysis (DEA, hereafter) estimation can fail to capture some factors that relate to production input. Last but not least, using residuals as the measure of managerial ability may introduce some factors that are not attributable to managerial ability if there are omitted variables in the second stage regression model. Moreover, the ability measure in Demerjian et al. (2012) should be interpreted primarily as a measure of managerial efficiency in generating revenues; thus it is correlated with firm performance. This measure may therefore create a reverse causality problem.

condition, the level of free cash flows, and corporate governance. Consistent with this view, empirical studies show that the marginal value of cash is especially high in financially constrained firms. For instance, Faulkender and Wang (2006) report that when firms experience low levels of internal funding and resort to external markets to raise cash, their cash has a marginal value higher than \$1, depending on the transaction costs occurring in the capital markets.

### 2.3. Hypothesis

Cash is the internal fund under CEOs' control (Liu & Mauer, 2011). Jensen (1986) suggests that with available cash under their control, CEOs affect how the cash will be utilized. This suggests that the marginal value of cash can be higher for firms that hire more able CEOs because more talented CEOs are likely to better anticipate the firm's future business environment and make better use of financial resources, thereby enhancing firm performance (e.g., Baik et al., 2011; Banker et al., 2013; Carter et al., 2010; Chang et al., 2010; Goodman et al., 2013; Harris & Holmstrom, 1982; Jian & Lee, 2011; Rajgopal et al., 2006; Trueman, 1986). In particular, Demerjian et al. (2012) substantiate that high-quality CEOs generate a higher rate of output from given inputs than lower-quality CEOs. Therefore, high-quality CEOs are expected to spend cash more wisely and efficiently on the inputs to ensure high levels of the output, increasing the marginal value of cash.

Furthermore, as a firm's cash reserves increase, the firm can reduce transaction costs because it is less likely to access capital markets in the near future. If this is the case, the firm is more likely to return extra cash to shareholders (Faulkender & Wang, 2006)<sup>3</sup>. In fact, prior literature (e.g., Harford, Mansi, & Maxwell, 2008; Huang, Elkinawy, & Jain, 2013) shows a positive association between cash reserves and investor protection. Thus, investors may attach a higher value to cash of one dollar if they believe the CEO has a greater ability to manage cash more effectively and efficiently. Therefore, we propose the following hypothesis in alternative form:

**H1.** The marginal value of cash is higher for firms with more able CEOs than for firms with less able CEOs.

## 3. Research design

### 3.1. Data and sample selection

The sample period in this study is from 2003 to 2013. We collect financial variables and monthly stock returns from the COMPUSTAT and CRSP databases. We download the dataset of size and book-to-market matched portfolios constructed by Fama and French (1993) from Dr. Kenneth French's website. For the managerial ability variables, we utilize the dataset published on Dr. Sarah McVay's website, which contains managerial ability scores and managerial ability rankings through 2013. In this study, we employ both measures as proxies for managerial ability. We first merge the monthly stock returns dataset with the size and book-to-market matched portfolio dataset to construct excess stock returns. We then merge the dataset with constructed excess stock returns with the financial dataset and managerial ability dataset. We exclude both financial services industries (with SIC codes between 6000 and 6999) and utility industries (with SIC codes between 4900 and 4999) from the sample because the liquidity of firms in financial industries is hard to assess, and the utility sector complies with a special regulatory system (e.g., Dittmar & Mahrt-Smith, 2007; Liu & Mauer, 2011). We then delete observations that are missing values in our

<sup>3</sup> However, holding a large volume of free cash flow can be risky because management may engage in excessive value-decreasing investments leading to low value of cash. Faulkender and Wang (2006) argue that the marginal value of cash declines if firms with free cash flow distribute the extra cash to shareholders or use the cash to settle debt rather than invest in value-increasing projects. We discuss the details in Section 5.

variables, leaving 27,799 firm-year observations as the final sample.

### 3.2. Managerial ability measure

We use the managerial ability proxies developed by Demerjian et al. (2012), who employ two stages to construct managerial ability measures. In the first stage, they apply the DEA statistical procedure to generate firm efficiency scores, with the underlying rationale of maximizing the output - the revenue - while minimizing the inputs, including the cost of inventory, general and administrative expenses, operating leases, R & D, fixed assets, and intangible assets. In the second stage, a regression model with the firm efficiency score as the dependent variable and firm size, market share, firm age, free cash flow, business segments, foreign currency indicator, and year indicator as the independent variables is estimated to separate managerial factors from firm characteristics. Managerial ability scores are the residuals from the estimation of this regression model.

In this study, we use changes in managerial ability measures rather than levels variables as independent variables of interest, for the following reasons. First, the ability measure in Demerjian et al. (2012) is interpreted primarily as a measure of managerial efficiency in generating revenues and thus is correlated with firm performance, which may create reverse causality and endogeneity problems. Using change variables can help mitigate such problems. Second, as managerial ability scores are the residuals from any firm efficiency outside of the set of the identified firm features, if the set of firm features is not exhaustive, ability scores may contain efficiency inherent to the firm. Such measurement errors may bias the estimation on the association between managerial ability and the marginal value of cash, and the bias can be exaggerated if we use levels of the measures. Third, most of variables used in Faulkender and Wang (2006) are change variables, so their model is essentially a change model. Using changes of managerial ability scores ensures measurement consistency across the variables in the model. In our extended study, we use change specifications following Faulkender and Wang (2006).

In addition to ability scores, we use changes of managerial ability rankings as our robustness checks. Ability rankings are created by ranking the ability scores in deciles by year and industry to make the score more comparable across time and industries and to mitigate the influence of extreme observations (Demerjian et al., 2013).

### 3.3. Empirical model

We adopt the method of evaluating the marginal value of cash developed by Faulkender and Wang (2006). In order to examine the incremental effects of managerial ability on the marginal value of cash, we add change in managerial ability scores (or change in managerial ability rankings) and its interaction with change in cash to the model and estimate the following model (1). The model regresses excess return on changes in cash while controlling other firm characteristics such as profitability, financial status, and investment practice. All independent variables except *Leverage* are scaled by the beginning market value of equity ( $M_{i,t-1}$ ). In this way, the coefficient of the interaction between change in managerial ability and the dollar change in cash,  $\beta_3$ , indicates the incremental effect of increasing managerial ability on the marginal value of cash and is expected to be positive. We control for firm fixed effects and year fixed effects in the model<sup>4</sup>.

<sup>4</sup> Cash flow is likely correlated with a number of the inputs and the output used in Demerjian et al.'s (2012) DEA. If so, managerial ability measures may be correlated with other independent variables in our regression model and thus may bias our results. To address this concern, we conduct a test to check for any potential multicollinearity among variables in our regression model (1) using the variance inflation factor (VIF). A rule of thumb is that if the VIF of any independent variable is  $> 10$ , the multicollinearity is high. We find that all of the independent variables in our model (1), including cash flows, have VIFs of  $< 10$ . Moreover, in Table 2, we show that the correlation between Demerjian

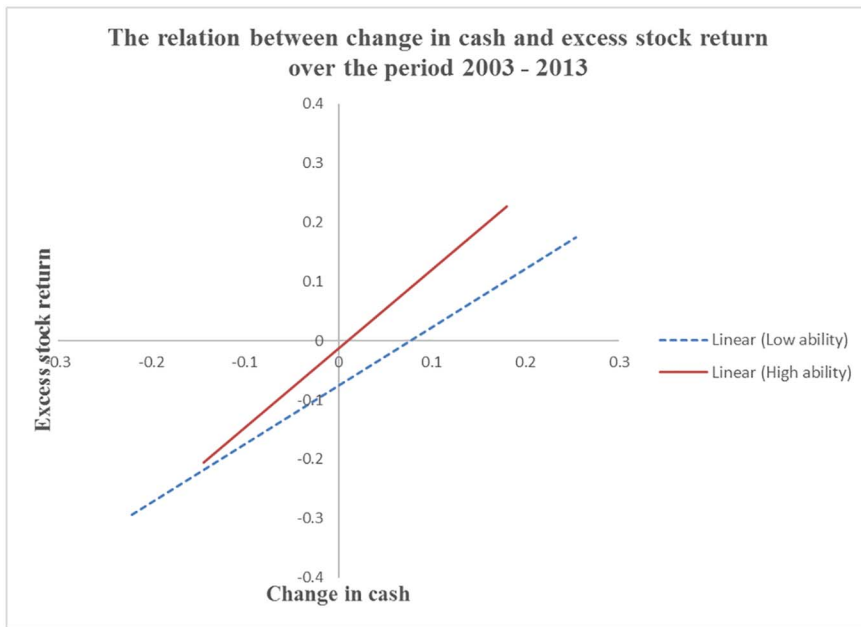


Fig. 1. The relation between change in cash and excess stock return over the period 2003–2013.

$$\begin{aligned}
 EXRET_{i,t} = & \beta_0 + \beta_1 \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + \beta_2 \Delta ABILITY_{i,t} + \beta_3 \Delta ABILITY_{i,t} \times \frac{\Delta Cash_{i,t}}{M_{i,t-1}} \\
 & + \beta_4 \frac{\Delta Earnings_{i,t}}{M_{i,t-1}} + \beta_5 \frac{\Delta NetAssets_{i,t}}{M_{i,t-1}} + \beta_6 \frac{\Delta R \& D_{i,t}}{M_{i,t-1}} + \beta_7 \frac{\Delta InterestExpense_{i,t}}{M_{i,t-1}} \\
 & + \beta_8 \frac{\Delta Dividends_{i,t}}{M_{i,t-1}} + \beta_9 \frac{Cash_{i,t-1}}{M_{i,t-1}} + \beta_{10} Leverage_{i,t} \\
 & + \beta_{11} \frac{NetFinance_{i,t}}{M_{i,t-1}} + \beta_{12} \frac{Cash_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + \beta_{13} Leverage_{i,t} \\
 & \times \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + e_{i,t},
 \end{aligned}
 \tag{1}$$

where  $EXRET_i$  = a stock's excess return over the fiscal year: stock  $i$ 's return during fiscal year  $t$  (computed using monthly returns from CRSP) less the return of stock  $i$ 's size and book-to-market matched portfolio during fiscal year  $t$  constructed through the method in Fama and French (1993)<sup>5</sup>;  $\Delta Cash$  = change in cash and marketable securities;  $\Delta ABILITY$  = CEO managerial ability scores,  $\Delta AbilityScore$ , or CEO managerial ability rankings,  $\Delta AbilityRanking$ ;  $\Delta Earnings$  = change in earnings before extraordinary items;  $\Delta NetAssets$  = change in total assets minus cash;  $\Delta R \& D$  = change in R & D (0 if missing);  $\Delta InterestExpense$  = change in interest expenses;  $\Delta Dividend$  = change in common dividends distributed to common stock;  $Cash$  = cash and marketable securities;  $Leverage$  = total debt divided by the sum of the book value of total debt and the market value of equity;  $NetFinance$  = new finance in year  $t$ , including net new equity issues and net new debt issues;  $M$  = market value of equity.

Further, using the four different financial constraints criteria proposed by Almeida, Campello, and Weisbach (2004) and Denis and Sibilkov (2010), we investigate the effect of managerial ability on the marginal value of cash across financially constrained and financially unconstrained firms.

The first criterion is the annual payout ratio, measured as dividends and common stock repurchases divided by operating income. For each year, we assign those firms in the bottom (top) three deciles of the

(footnote continued)

et al.'s (2012) ability measure and cash flow variable is low. Together, these tests show that the potential correlation between managerial ability measures and other variables including cash flows does not pose a serious problem in our analyses.

<sup>5</sup> The 25 Fama and French portfolios, constructed on size and book-to-market, are value-weighted returns and are used as benchmark portfolios to calculate a stock's excess return. The returns to these portfolios are available from this website: [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

annual cash payout ratio distribution to the financially constrained (unconstrained) group. The next criterion is firm size. Since smaller firms are usually younger and less well known, they are more exposed to liquidity issues because they have less access to capital markets. We rank our sample firms based on their book value of total assets each year, and classify the bottom (top) three deciles of the distribution as the financially constrained (unconstrained) group. Debt rating is the third criterion. Firms are considered to be financially unconstrained if they have had their long-term debt rated by Standard & Poor (available in the COMPUSTAT database) and their debts are not in default (a rating of "D" or "SD"). Firms are considered constrained if they have debt outstanding that year but have never had their public debt rated before (or if the long-term debt rating is unavailable). Firms with no debt outstanding are considered unconstrained. The last criterion is paper rating. Consistent with Denis and Sibilkov (2010), if firms have had their short-term debts rated by S & P and their debts are not in default, they are labeled financially unconstrained. Conversely, if they have debt outstanding that year but have never had their short-term debt rated before (or if the rating is unavailable), they are labeled as financially constrained. Similar to the situation of debt ratings, firms with no short-term debt outstanding are treated as financially unconstrained. Using these criteria, we re-estimate our model (1) using financially constrained and unconstrained groups.

#### 4. Empirical results

##### 4.1. Descriptive statistics and univariate results

In Fig. 1, we plot the relation between change in cash and excess stock return by high-ability CEOs and low-ability CEOs. We use the median of managerial ability scores as the cutoff.

Fig. 1 shows that high-ability CEOs show higher stock returns and a steeper line than low-ability CEOs, indicating that the market generally reacts more favorably to the change in cash if the cash is managed by high-ability CEOs.

Table 1 reports descriptive statistics of the full sample and the descriptive statistics and difference tests of low- versus high-ability groups<sup>6</sup>.

<sup>6</sup> All data are adjusted to real value in 2013 dollars using the consumer price index (CPI), and all continuous variables are winsorized at 1% and 99% of their distributions to minimize the effect of outliers.

**Table 1**  
Descriptive statistics

Panel A: full sample								
	N	Mean	Std	p5	p25	Median	p75	p95
EX_RET	27799	0.050	0.585	-0.641	-0.281	-0.045	0.228	1.074
AbilityScore	27799	-0.004	0.140	-0.222	-0.094	-0.014	0.075	0.249
ΔAbilityScore	27799	0.003	0.080	-0.131	-0.028	0.003	0.036	0.129
AbilityRanking	27799	0.545	0.274	0.100	0.300	0.500	0.800	1.000
ΔAbilityRanking	27799	-0.001	0.165	-0.300	-0.100	0.000	0.100	0.300
ΔCash	27799	0.009	0.137	-0.180	-0.031	0.002	0.041	0.218
ΔEarnings	27799	0.034	0.272	-0.241	-0.026	0.006	0.041	0.373
ΔNetAssets	27799	0.005	0.372	-0.524	-0.062	0.011	0.092	0.491
ΔR & D	27799	-0.001	0.021	-0.024	0.000	0.000	0.001	0.018
ΔInterestExpense	27799	0.000	0.019	-0.021	-0.002	0.000	0.002	0.021
ΔDividends	27799	0.000	0.013	-0.005	0.000	0.000	0.000	0.010
Cash	27799	0.204	0.269	0.007	0.044	0.114	0.253	0.718
Leverage	27799	0.207	0.219	0.000	0.018	0.142	0.318	0.683
NewFinance	27799	0.025	0.198	-0.187	-0.038	0.000	0.038	0.356

Panel B: high versus low managerial ability score								
	Low Ability			High Ability			t-test	Wilcoxon-test
	N	Mean	Median	N	Mean	Median		
EX_RET	13897	0.015	-0.083	13902	0.085	-0.012	0.000	0.000
ΔCash	13897	0.007	0.001	13902	0.012	0.003	0.002	0.000
ΔEarnings	13897	0.031	0.003	13902	0.038	0.008	0.039	0.000
ΔNetAssets	13897	-0.040	-0.004	13902	0.049	0.024	0.000	0.000
ΔR & D	13897	-0.003	0.000	13902	0.000	0.000	0.000	0.000
ΔInterestExpense	13897	0.000	0.000	13902	0.000	0.000	0.753	0.003
ΔDividends	13897	0.000	0.000	13902	0.001	0.000	0.000	0.000
Cash	13897	0.232	0.134	13902	0.177	0.099	0.000	0.000
Leverage	13897	0.231	0.167	13902	0.184	0.122	0.000	0.000
NewFinance	13897	0.034	0.000	13902	0.017	-0.001	0.000	0.000

All variables are defined in [Appendix A](#).

As Panel A shows, the average excess stock return is positive (0.050) while the median is negative (-0.045) over the sample period. The mean (median) managerial ability score is -0.004 (-0.014), and the change in managerial ability score has an average of 0.003. The managerial ability ranking has an average of 0.545 (0.500), but the change in managerial ability ranking has an average of -0.001. Turning to the financial characteristics, we see that the sample firms have positive changes in cash balance, earnings, and net assets. The mean cash change is 0.009, and the average cash value (deflated by the lagged market value of the equity) is 0.204. The mean value of leverage is 0.207 in our sample.

Panel B of [Table 1](#) reports descriptive statistics by low versus high managerial ability based on the median of the managerial ability score as a benchmark. As it shows, the excess stock return is significantly higher in the high-ability group (with a mean value of 0.085 and a median of -0.012) than in the low-ability group (with a mean value of 0.015 and -0.083). Firms with high-ability CEOs significantly outperform those with low-ability CEOs in the annual changes of cash, changes of earnings, changes of net assets, changes of R & D, and free cash flows. Finally, firms in the high-ability group have lower cash levels, leverage, and net finance figures. Overall, our results show that high-ability CEOs perform better than low-ability CEOs in cash management and thus stock returns.

[Table 2](#) displays the Spearman correlation matrix of the selected variables in the analysis. The changes in managerial ability proxies (both managerial ability score and ranking) are positively correlated with excess annual stock returns, changes in earnings, changes in net assets, changes in R & D, changes in dividend payout, levels of cash, and net finance, while negatively correlated with changes in cash, changes in interest expense, leverage, and free cash flows.

#### 4.2. Multivariate regression results

[Table 3](#) presents the results of multivariate regression analyses of managerial ability and the marginal value of cash (Model 1).

We first estimate the original model proposed by [Faulkender and Wang \(2006\)](#), with the results tabulated in Column (1) of [Table 3](#). The results are consistent with prior literature (e.g., [Dittmar & Mahrt-Smith, 2007](#); [Faulkender & Wang, 2006](#); [Liu & Mauer, 2011](#)). The coefficient estimate corresponding to the change in cash balance indicates that shareholders value one marginal dollar of cash at \$1.898. In addition, the results show that as the level of cash increases, the value of cash to shareholders decreases. Specifically, the coefficient on the interaction term,  $\Delta Cash * Cash$ , is negative and significant at the 5% level ( $t$ -statistic = -2.27). *Leverage* also has a negative impact on the marginal value of cash, as reflected in the significantly negative coefficient estimate of the interaction between change in cash and leverage ( $t$ -statistic = -9.55). Furthermore, the changes in earnings, net assets, and dividends are shown to positively affect the excess stock return (e.g., [Denis & Sibilkov, 2010](#); [Faulkender & Wang, 2006](#)).

More importantly, to estimate the incremental effect of managerial ability on the marginal value of cash, we add the change in managerial ability scores ( $\Delta AbilityScore$ ) and its interaction with change in cash ( $\Delta Cash * \Delta AbilityScore$ ) to the original model and report the regression results in Column (2). We also use managerial ability ranking as an alternative proxy for managerial ability and report the results in Column (3). As shown in Columns (2) and (3), we find significantly positive coefficient estimates of the interaction between change in cash and change in ability scores,  $\Delta Cash * \Delta AbilityScore$  ( $t$ -statistic = 3.89), and the interaction between change in cash and change in ability

**Table 2**  
Spearman correlations among selected variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. <i>EX_RET</i>	1.000													
2. <i>AbilityScore</i>	<b>0.105</b>	1.000												
3. $\Delta$ <i>AbilityScore</i>	<b>0.148</b>	<b>0.248</b>	1.000											
4. <i>AbilityRanking</i>	<b>0.111</b>	<b>0.947</b>	<b>0.237</b>	1.000										
5. $\Delta$ <i>AbilityRanking</i>	<b>0.134</b>	<b>0.232</b>	<b>0.808</b>	<b>0.280</b>	1.000									
6. $\Delta$ <i>Cash</i>	<b>0.218</b>	<b>0.022</b>	– 0.045	<b>0.029</b>	– 0.038	1.000								
7. $\Delta$ <i>Earnings</i>	<b>0.301</b>	<b>0.078</b>	<b>0.307</b>	<b>0.079</b>	<b>0.243</b>	<b>0.144</b>	1.000							
8. $\Delta$ <i>NetAssets</i>	<b>0.163</b>	<b>0.188</b>	<b>0.139</b>	<b>0.178</b>	<b>0.107</b>	– 0.066	<b>0.127</b>	1.000						
9. $\Delta$ <i>R &amp; D</i>	<b>0.028</b>	<b>0.106</b>	<b>0.079</b>	<b>0.099</b>	<b>0.059</b>	<b>0.031</b>	– 0.084	<b>0.188</b>	1.000					
10. $\Delta$ <i>InterestExpense</i>	– 0.058	<b>0.041</b>	– 0.036	<b>0.031</b>	– 0.026	– 0.009	<b>0.006</b>	<b>0.246</b>	<b>0.050</b>	1.000				
11. $\Delta$ <i>Dividends</i>	<b>0.096</b>	<b>0.109</b>	<b>0.038</b>	<b>0.105</b>	<b>0.029</b>	<b>0.013</b>	<b>0.039</b>	<b>0.131</b>	<b>0.048</b>	<b>0.017</b>	1.000			
12. <i>Cash</i>	<b>0.016</b>	– 0.121	<b>0.055</b>	– 0.118	<b>0.045</b>	– 0.193	<b>0.047</b>	– 0.090	– 0.040	– 0.035	– 0.108	1.000		
13. <i>Leverage</i>	– 0.139	– 0.101	– 0.058	– 0.112	– 0.031	– 0.039	– 0.038	– 0.058	– 0.090	<b>0.066</b>	– 0.051	– 0.121	1.000	
14. <i>NewFinance</i>	– 0.012	– 0.053	<b>0.028</b>	– 0.046	<b>0.022</b>	<b>0.174</b>	– 0.007	<b>0.369</b>	<b>0.053</b>	<b>0.313</b>	0.005	– 0.008	– 0.010	1.000

Bold correlation coefficients are significant at least  $p < 0.10$ . All variables are defined in Appendix A.

**Table 3**  
The association between managerial ability and the marginal value of cash.

(N = 27,799)			
	(1)	(2)	(3)
	EX_RET Coefficient (t-stat)	EX_RET Coefficient (t-stat)	EX_RET Coefficient (t-stat)
$\Delta$ <i>Cash</i>	1.898*** (21.07)	1.916*** (21.69)	1.919*** (21.66)
$\Delta$ <i>AbilityScore</i>		0.410*** (8.33)	
$\Delta$ <i>Cash</i> * $\Delta$ <i>AbilityScore</i>		1.864*** (3.89)	
$\Delta$ <i>AbilityRanking</i>			0.212*** (9.22)
$\Delta$ <i>Cash</i> * $\Delta$ <i>AbilityRanking</i>			0.809*** (3.38)
$\Delta$ <i>Earnings</i>	0.392*** (15.02)	0.364*** (14.00)	0.365*** (14.02)
$\Delta$ <i>NetAssets</i>	0.124*** (5.73)	0.114*** (5.34)	0.116*** (5.40)
$\Delta$ <i>R &amp; D</i>	– 0.504* (– 1.70)	– 0.758** (– 2.55)	– 0.731** (– 2.45)
$\Delta$ <i>InterestExpense</i>	– 0.496 (– 1.38)	– 0.412 (– 1.15)	– 0.434 (– 1.21)
$\Delta$ <i>Dividends</i>	1.224*** (3.92)	1.172*** (3.77)	1.163*** (3.74)
<i>Cash</i>	1.119*** (25.41)	1.109*** (25.13)	1.107*** (25.07)
<i>Leverage</i>	– 1.311*** (– 28.82)	– 1.299*** (– 28.62)	– 1.298*** (– 28.63)
<i>NewFinance</i>	0.046 (1.05)	0.043 (0.97)	0.041 (0.93)
$\Delta$ <i>Cash</i> * <i>Cash</i>	– 0.298** (– 2.27)	– 0.325** (– 2.48)	– 0.329** (– 2.51)
$\Delta$ <i>Cash</i> * <i>Leverage</i>	– 1.906*** (– 9.55)	– 1.911*** (– 9.61)	– 1.908*** (– 9.59)
INTERCEPT	0.064*** (3.27)	0.065*** (3.33)	0.069*** (3.56)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.427	0.321	0.431

All variables are defined in Appendix A. All statistics and significance levels are based on standard errors adjusted by a cluster at the firm level. \*, \*\*, and \*\*\* indicates significance levels at 10%, 5%, and 1%, respectively.

rankings,  $\Delta$ *Cash*\* $\Delta$ *AbilityRanking* ( $t$ -statistic = 3.38). In terms of the economic significance of these coefficient estimates, shareholders place an additional \$0.149 (\$0.133) on one marginal dollar of cash per one standard deviation increase in change in ability scores (change in

ability rankings). Together, these results suggest that managerial ability plays a significant role in enhancing the marginal value of cash. The coefficients and significance of other variables in these two multivariate regressions are consistent with those in the original model.

Next, in order to test the marginal value of cash for financially constrained firms, Faulkender and Wang (2006) use four criteria, payout ratio, firm size, bond ratings, and commercial paper ratings, as proxies for financial constraints. Thus, relying on these four criteria, we examine the association between the marginal value of cash and managerial ability across financially constrained and unconstrained firms based on four different financial constraint criteria. Internal cash would be more valuable for firms that are less likely to access external capital markets and firms that face higher transaction costs when doing so (Faulkender & Wang, 2006). Thus, the market will place a higher value on cash if firms face external fund-raising problems when they need to obtain additional funds (Faulkender & Wang, 2006). The marginal value of cash can vary depending on firms' financial situations. That is, it seems possible that managerial ability might have more effect on the marginal value of cash when cash is low/tight. Therefore, we conjecture that the positive effect of high managerial ability on the marginal value of cash will be more pronounced for firms that are financially constrained.

Results are tabulated in Table 4. They are largely consistent with our predictions, except for the result based on paper ratings. Specifically, the coefficient on  $\Delta$ *Cash*\* $\Delta$ *AbilityScore* is positive and significant at the 1% level across four criteria. For the three proxies (payout ratio, firm size, and debt ratings), the magnitude of the coefficient on the interaction term for constrained firms is larger than that for unconstrained firms, indicating that more able CEOs have more effect on the marginal value of cash when the cash is tight. In terms of paper ratings, while managerial ability contributes to the marginal value of cash regardless of the paper ratings, the managerial ability effect is even stronger for firms with high commercial paper ratings (i.e., the magnitude of the coefficient for unconstrained firms is larger). This result is puzzling because firms with commercial paper ratings are considered among the safest (Faulkender & Wang, 2006). This result may be due to unbalanced firm-year observations between firms with and those without commercial papers. In our sample, about one-third of the firms in our sample are classified as financially unconstrained, while two-thirds are classified as financially constrained. The results based on ability ranking (Panel B) are qualitatively similar to those in Panel A.

**Table 4**  
The association between managerial ability and the marginal value of cash by financial constraints.

Panel A: using managerial ability score								
	Payout Ratio		Firm Size		Debt Rating		Paper Rating	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Constrained	Unconstrained	Constrained	Unconstrained	Constrained	Unconstrained	Constrained	Unconstrained
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
$\Delta Cash$	1.969*** (16.29)	1.823*** (8.26)	1.997*** (12.78)	1.430*** (7.64)	1.956*** (14.69)	1.927*** (14.49)	1.910*** (16.67)	1.994*** (11.95)
$\Delta AbilityScore$	0.389*** (5.02)	0.209** (2.08)	0.609*** (5.81)	0.121* (1.68)	0.403*** (5.06)	0.351*** (5.21)	0.358*** (5.35)	0.385*** (5.01)
$\Delta Cash * \Delta AbilityScore$	1.830*** (3.07)	0.954 (0.64)	2.692*** (3.14)	1.771 (1.63)	2.258*** (3.01)	1.354* (1.90)	1.444** (2.29)	2.734*** (3.05)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12,914	8335	8345	8335	12,711	15,039	17,839	9950
Adj. R <sup>2</sup>	0.334	0.337	0.335	0.310	0.339	0.349	0.341	0.347
Panel B: using managerial ability ranking								
	Payout Ratio		Firm Size		Debt Rating		Paper Rating	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Constrained	Unconstrained	Constrained	Unconstrained	Constrained	Unconstrained	Constrained	Unconstrained
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
$\Delta Cash$	1.969*** (16.21)	1.827*** (8.35)	1.989*** (12.69)	1.434*** (7.66)	1.954*** (14.59)	1.939*** (14.61)	1.909*** (16.67)	2.007*** (11.97)
$\Delta AbilityRanking$	0.204*** (5.51)	0.148*** (3.58)	0.267*** (5.64)	0.113*** (3.45)	0.181*** (4.98)	0.206*** (6.44)	0.189*** (6.08)	0.201*** (5.40)
$\Delta Cash * \Delta AbilityRanking$	0.669** (2.21)	0.510 (0.69)	1.161*** (2.95)	0.768 (1.36)	0.945** (2.56)	0.678* (1.87)	0.625** (1.98)	1.252*** (2.81)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12,914	8335	8345	8335	12,711	15,039	17,839	9950
Adj. R <sup>2</sup>	0.334	0.339	0.334	0.311	0.338	0.350	0.341	0.347

All variables are defined in Appendix A. The control variables are the same as those in Table 3. All statistics and significance levels are based on standard errors adjusted by a cluster at the firm level. \*, \*\*, and \*\*\* indicates significance levels at 10%, 5%, and 1%, respectively.

## 5. Additional analysis

### 5.1. The effects of managerial ability on the marginal value of cash contingent on management entrenchment

A strong corporate governance mechanism can also effectively enhance the marginal value of cash. Prior literature shows that the value of cash can depend on the strength of corporate governance in a firm (Dittmar & Mahrt-Smith, 2007; Harford et al., 2008). For example, Dittmar and Mahrt-Smith (2007) show that the value of cash is positively associated with corporate governance and that good governance (as compared to poor governance) can double the value of cash. Together these findings suggest that the positive effect of managerial ability on the marginal value of cash can be enhanced when firms' corporate governance is stronger. Thus, we conduct additional analysis to see if the association between managerial ability and the marginal value of cash depends on the strength of corporate governance.

To test this issue, we employ three measures of management entrenchment: the entrenchment index created by Bebchuk, Cohen, and Ferrell (2009), the percentage of inside directors on a board, and the percentage of shares held by inside directors (inside director ownership) as proxies for firms' corporate governance strength. As the management is more (less) entrenched, the corporate governance is weaker (stronger); thus the marginal value of cash is lower (higher) and the impact of increasing managerial ability on the marginal value of cash is less (more) evident. We classify our sample firms into low- or high-entrenchment firms based on the median of these three measures, and we estimate Model (1) with each sub-sample.

Table 5 reports the results. The magnitudes of the coefficient

estimates for change in cash are consistently smaller for firms deemed to have more entrenchment problems than for those with fewer entrenchment issues. This suggests that the marginal value of cash is lower for firms that have weak corporate governance as evidenced by a high degree of entrenchment. Furthermore, for the low-entrenchment group, the coefficients on  $\Delta Cash * \Delta AbilityScore$  in all three entrenchment proxies are positive and significant at the 5% and 10% level, respectively. This evidence suggests that the positive impact of managerial ability on cash value is more evident for firms with low entrenchment than for those with high entrenchment. Collectively, our results suggest that stronger corporate governance is necessary to ensure that high-quality CEOs generate high marginal value out of cash. We observe similar results using managerial ranking as an alternative proxy for managerial ability (Panel B).

### 5.2. The association between managerial ability and the value of free cash flow

The free cash flow component of total cash flow can be problematic because it is subject to relatively more managerial discretion than the other components of cash flow. Thus the association between managerial ability and the marginal value of cash may vary depending on the level of free cash flows. In this section, we investigate the association between managerial ability and the marginal value of free cash flow. We predict stronger results on the effect of managerial ability on free cash flow, over which managers have more discretion<sup>7</sup>. We separate cash flows that are free and under the control of the CEOs from

<sup>7</sup> We thank an anonymous reviewer for suggesting this insightful test.

**Table 5**  
Cross-sectional tests on management entrenchment.

Panel A: using managerial ability score						
	Eindex		Percentage of inside directors		Inside director ownership	
	(1)	(2)	(3)	(4)	(5)	(6)
	Low	High	Low	High	Low	High
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
$\Delta Cash$	1.651*** (8.45)	1.505*** (6.92)	1.636*** (8.70)	1.290*** (5.27)	1.749*** (9.17)	1.426*** (6.78)
$\Delta AbilityScore$	0.285*** (3.34)	0.298*** (2.73)	0.417*** (4.54)	0.275*** (2.59)	0.165* (1.83)	0.581*** (5.78)
$\Delta Cash * \Delta AbilityScore$	2.354** (2.15)	-0.664 (-0.54)	2.013* (1.86)	0.918 (0.62)	1.896* (1.70)	-0.383 (-0.29)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	5865	4087	5092	4407	4689	4685
Adj. R <sup>2</sup>	0.361	0.288	0.323	0.268	0.315	0.286
Panel B: using managerial ability ranking						
	Eindex		Percentage of inside directors		Inside director ownership	
	(1)	(2)	(3)	(4)	(5)	(6)
	Low	High	Low	High	Low	High
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
$\Delta Cash$	1.660*** (8.44)	1.493*** (7.09)	1.653*** (8.79)	1.283*** (5.27)	1.771*** (9.28)	1.435*** (6.84)
$\Delta AbilityRanking$	0.158*** (3.97)	0.193*** (3.74)	0.219*** (5.00)	0.189*** (3.70)	0.105** (2.41)	0.282*** (5.83)
$\Delta Cash * \Delta AbilityRanking$	1.070* (1.83)	0.182 (0.28)	1.383** (2.54)	0.700 (0.87)	1.512** (2.33)	0.036 (0.05)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	5865	4087	5092	4407	4689	4685
Adj. R <sup>2</sup>	0.362	0.291	0.327	0.272	0.319	0.288

High versus low classifications are based on the median of Eindex (percentage of inside directors, or inside director ownership). Above median are defined as high and below median are defined as low. The control variables are the same as those in Table 3. All variables are defined in Appendix A. All statistics and significance levels are based on standard errors adjusted by a cluster at the firm level. \*, \*\*, and \*\*\* indicates significance levels at 10%, 5%, and 1%, respectively.

those that are not and evaluate the impact of managerial ability on each of them. We define free cash flows as follows: free cash flows = cash flows from operating activities - capital expenditures - dividends. We then define non-free cash flows as cash - free cash flows. We augment the baseline model (i.e., Faulkender & Wang, 2006) by including these two components as well as their respective interaction terms with managerial ability measures as follows:

$$\begin{aligned}
 EXRET_{i,t} = & \beta_0 + \beta_1 \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + \beta_2 \frac{FreeCashFlows_{i,t}}{M_{i,t-1}} + \beta_3 \frac{NonFreeCashFlows_{i,t}}{M_{i,t-1}} \\
 & + \beta_4 \Delta ABILITY_{i,t} + \beta_5 \Delta ABILITY_{i,t} \times \frac{FreeCashFlows_{i,t}}{M_{i,t-1}} \\
 & + \beta_6 \Delta ABILITY_{i,t} \times \frac{NonFreeCashFlows_{i,t}}{M_{i,t-1}} + \beta_7 \frac{\Delta Earnings_{i,t}}{M_{i,t-1}} \\
 & + \beta_8 \frac{\Delta NetAssets_{i,t}}{M_{i,t-1}} + \beta_9 \frac{\Delta R \& D_{i,t}}{M_{i,t-1}} + \beta_{10} \frac{\Delta InterestExpense_{i,t}}{M_{i,t-1}} \\
 & + \beta_{11} \frac{\Delta Dividends_{i,t}}{M_{i,t-1}} + \beta_{12} \frac{Cash_{i,t-1}}{M_{i,t-1}} + \beta_{13} Leverage_{i,t} \\
 & + \beta_{14} \frac{NetFinance_{i,t}}{M_{i,t-1}} + \beta_{15} \frac{Cash_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + \beta_{16} Leverage_{i,t} \\
 & \times \frac{\Delta Cash_{i,t}}{M_{i,t-1}} + e_{i,t}, \tag{2}
 \end{aligned}$$

In Model (2), if managerial ability has an incremental effect on the value of free cash flows,  $\beta_5$  is predicted to be positive. The results are tabulated in Table 6. As shown in Column (1), the interaction term,  $FreeCashFlows * \Delta AbilityScore$ , is positive and significant at the 1% level, indicating that managerial ability has an incremental effect in valuing the free cash flows. However, the coefficient on the interaction term between non-free cash flows and ability measures is insignificant. Together, these results suggest that managerial ability matters most in

settings in which managerial discretion is highest. We find a similar result when using ability rankings in Column (2).

### 5.3. Other tests using the level of managerial ability measures

As discussed above, in order to mitigate the potential reverse causality problems and bias, we have used changes in managerial ability measures so far for all the tests. However, as a robustness check, we conduct the analyses using the levels of managerial ability measures in Table 7. As shown, the level of managerial ability scores (in Column 1) has a positive and significant effect on the marginal value of cash ( $p < 0.5$ ), consistent with our main conjecture. The results using the level of managerial ability rankings (in Column 2) are consistent with those using the change measure of managerial ability.

Finally, Campello, Graham, and Harvey (2010) report that during a financial crisis, firms are more likely to use more cash to survive because the economy entails more risk. Thus, firms are likely to manage cash as efficiently as possible in the economic downturn because even profitable firms may go broke if they have limited cash liquidity and access to capital markets is costly. To see the impact of managerial ability on marginal cash value in a financial crisis, we partition our sample into financial crisis (2007–2009) and non-crisis periods and replicate our regression analyses. Untabulated results show no significant difference in the association of the marginal cash value with managerial ability between financial crisis and non-crisis periods.



**Table 6**  
The association between managerial ability and the value of free cash flows.

(N = 27,762)		
	(1)	(2)
	EX_RET Coefficient (t-stat)	EX_RET Coefficient (t-stat)
$\Delta$ Cash	1.297*** (9.32)	1.296*** (9.28)
FreeCashFlows	0.732*** (6.56)	0.735*** (6.55)
NotFreeCashFlows	0.460*** (4.50)	0.466*** (4.53)
$\Delta$ AbilityScore	0.430*** (6.25)	
FreeCashFlows* $\Delta$ AbilityScore	1.338*** (2.58)	
NotFreeCashFlows* $\Delta$ AbilityScore	0.118 (0.45)	
$\Delta$ AbilityRanking		0.210*** (6.44)
FreeCashFlows* $\Delta$ AbilityRanking		0.602** (2.36)
NotFreeCashFlows* $\Delta$ AbilityRanking		0.072 (0.59)
Control variables	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Adj. R <sup>2</sup>	0.327	0.437

FreeCashFlows is cash flows from operating activities - capital expenditures - dividends, and NotFreeCashFlows is cash - free cash flows. The control variables are the same as those in Table 3. All variables are defined in Appendix A. All statistics and significance levels are based on standard errors adjusted by a cluster at the firm level. \*, \*\*, and \*\*\* indicates significance levels at 10%, 5%, and 1%, respectively.

**Table 7**  
The association between levels of managerial ability and the marginal value of cash.

(N = 27,799)			
	(1)	(2)	(3)
	EX_RET Coefficient (t-stat)	EX_RET Coefficient (t-stat)	EX_RET Coefficient (t-stat)
$\Delta$ Cash	1.898*** (21.07)	1.915*** (21.26)	1.733*** (13.77)
AbilityScore		0.169*** (3.21)	
$\Delta$ Cash*AbilityScore		0.763** (2.21)	
AbilityRanking			0.098*** (3.81)
$\Delta$ Cash*AbilityRanking			0.346** (1.99)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.427	0.317	0.428

All variables are defined in Appendix A. The control variables are the same as those in Table 3. All statistics and significance levels are based on standard errors adjusted by a cluster at the firm level. \*, \*\*, and \*\*\* indicates significance levels at 10%, 5%, and 1%, respectively.

## 6. Conclusion

In this study, we investigate whether CEOs with higher ability generate higher value out of cash use. Cash is an important source of internal capital that is under the control of CEOs. The decision of how to deploy cash is at the discretion of management (Liu & Mauer, 2011). Thus, the value of cash differs depending on how CEOs use it, its availability, and the cost of external financing (e.g., Fazzari et al., 1988; Jensen, 1986; Myers & Majluf, 1984; Pinkowitz & Williamson, 2004). Moreover, managerial ability is positively associated with efficient investment decisions and firm performance (e.g., Baik et al., 2011; Banker et al., 2013; Carter et al., 2010; Chang et al., 2010; Goodman et al., 2013; Harris & Holmstrom, 1982; Jian & Lee, 2011; Rajgopal et al., 2006; Trueman, 1986). Thus, we argue that the marginal value of cash can vary across different levels of CEO managerial ability. In other words, the market will place a higher value on cash if the firm hires a high-ability CEO who manages the cash well.

Using the managerial ability measures developed by Demerjian et al. (2012), we find that CEO managerial ability significantly increases the marginal value of cash. We also find that the impact of managerial ability on the marginal value of cash is greater for firms that are especially financially constrained. In addition, our results show that the positive impact of managerial ability on the marginal cash value is more evident for firms with higher levels of free cash flows and less entrenched management. Overall, our study provides a fresh perspective by showing that the market reacts more favorably to a firm's cash holdings if the cash is managed by a more able CEO, and thus that shareholders consider the ability of a CEO when they evaluate cash.

## Data availability

Data used in this study are available from public sources identified in the study.

## Appendix A. Variable definitions

Variables	Definitions
EX_RET	A stock's excess return over the fiscal year - stock <i>i</i> 's return during fiscal year <i>t</i> (computed using monthly returns from CRSP) less the return of stock <i>i</i> 's size and book-to-market matched portfolio during fiscal year <i>t</i> constructed through the method in Fama and French (1993);
AbilityScore	CEO managerial ability scores as developed by Demerjian et al. (2012), continuous data;
$\Delta$ AbilityScore	Change in CEO managerial ability scores;
AbilityRanking	CEO managerial ability scores ranked in deciles as in Demerjian et al. (2013);
$\Delta$ AbilityRanking	Change in CEO managerial ability rankings;
$\Delta$ Cash	Change in cash and marketable securities;
$\Delta$ Earnings	Change in earnings before extraordinary items;
$\Delta$ NetAssets	Change in total assets excluding cash;
$\Delta$ R & D	Change in R & D Expenses (0 if missing);
$\Delta$ InterestExpense	Change in interest expenses;
$\Delta$ Dividend	Change in common dividends distributed to common stock;
Cash	Cash and marketable securities;
Leverage	Total debt divided by the sum of the book value of total debt and the market value of equity;
NetFinance	New finance in year <i>t</i> , measured as the sum of net new equity issues and net new debt issues;
FreeCashFlows	Cash flows from operating activities - capital expenditure - dividends;
NonFreeCashFlows	Cash - free cash flows
<i>M</i>	Market value of equity.

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