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Managerial ability and corporate investment opportunity

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ABSTRACT

This study examines whether firms operated by superior managers can obtain more favorable investment opportunities using data on U.S. industrial firms during 1988–2015. The empirical results disclose that there exists a positive relationship between managerial ability and investment opportunity, and that the relation is only significant in financially unconstrained firms or firms in a strong financial position. Overall, our findings support that firms having managers with superior ability could gain more economic profits via better investment opportunity. Through our research, policy makers and investors can pay more attention on managerial ability.

1. Introduction

Managerial ability has been proven to play an important determinant in tax avoidance, earnings quality, goodwill impairment, and other corporate policies. However, the relationship between investment opportunity and managerial ability has remained unclear for a long time, likely due to difficulty in measurement and other data limitations. This study focuses on how superior managerial ability affects investment opportunity for the following two reasons. First, as a crucial role in corporate finance, investment opportunity impacts a firm's capital structure, dividend policy, and future growth (Smith and Watts (1992), Kallapur and Trombley (1999)). Second, because investment opportunity is unobservable by outsiders, it would be helpful if we could link investment opportunity to other firm characteristics and managerial ability.

We argue that superior managers can understand industrial trends better, predict product demand more accurately, and invest in more value-creating projects, therefore associating themselves with better investment opportunity. Although the hypothesis we propose is somehow intuitive, a recent study in behavior corporate finance also shows that managers with a good reputation and compensation package may engage in more risk-averse and time preference projects that can harm investment opportunities (Graham, Campbell, and Manju (2013)). Moreover, we aim to find out whether the relation between managerial ability and investment opportunity varies under different financial conditions and economic environments. Rather than extrapolate the ability from managers' characteristics, education background, personality traits, and working experience, we examine the relation by adopting the newly developed measure of managerial ability introduced by Demerjian, Lev, and McVay (2012) - namely, the MA-score (henceforth, we use MA-score to represent managerial ability). This measure follows a two-step procedure composed of data envelopment analysis and multivariate regression to quantify managers' efficiency in generating revenue. Prior research shows that the MA-score can reflect management-specific factors more precisely through several valid tests and is thus a better measure of managerial ability.

The empirical evidence strongly supports our hypothesis, because our results document a significantly positive relation between managerial ability and investment opportunity, even after we control for firm fixed effects, year fixed effects, and other control variables. The empirical results indicate that managers with superior ability are related to more outstanding investment opportunities, as expected. In addition, we conduct a subsample test to look at how managerial ability's impact on investment opportunity operates in different financial conditions and find that the result is more pronounced for firms with a low Kaplan-Zingales Index and a high Altman *Z*-score. Lastly, we interact the MA-score with the HHI dummy and Recession dummy to examine theirs correlations under different industrial and economic conditions and show that superior ability can mitigate the adverse effect of industry competition and financial crisis. For robustness, we conduct many different tests. First, we adopt Tobin's q and the capital expenditure rate as alternative proxies for investment opportunity. Second, we use another methodology, first difference, to confirm the baseline regression. Third, we select the subsample of positive MA-scores to re-run analysis. Fourth, we use 2SLS with instrumental variables, system simultaneous equations model (SEM), and Granger Causality to solve the endogenous problem.[1] All results are still consistent with our expectation. Overall, we find that managerial ability is

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[1] Please see E. Robustness test.

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an important determinant of investment opportunity, and that firms in better financial condition can benefit more from exceptional managers.

This study contributes to the literature in several ways. First, our results shed light on the effect of managerial ability on investment opportunity and fill the gap in existing studies. Second, we identify which kind of firms can gain more economic benefits when employing extraordinary managers. Third, we adopt a new proxy for investment opportunity - namely, Total q - which has not been looked at by any studies. Fourth, our finding derives several economic implications for boards of directors, investors, and policy makers.

The remainder of this paper is organized as follows. Section II presents the relevant literature and our hypothesis development. Section III illustrates the process of sample construction and the main variables that we employ. Section IV documents the empirical results in this study. Finally, Section V offers some concluding remarks.

2. Literature review and hypotheses' development

In the research areas of corporate finance and accounting, whether and how an executive manager affects corporate behavior and performance have been considered important issues for a long time. Bertrand and Schoar (2003) find that managers with different styles, like experience and ability, tend to adopt different policies and strategies when making operating decisions. Koester, Shevlin, and Wangerin (2016) state that managers with a higher ability engage in more tax avoidance activities, such as tax planning and income shifting. Bonsall IV (2016) document that higher managerial ability is associated with lower variability in future earnings and stock returns and lower bond offering credit spreads. There are also studies that examine managers' impact on acquisition quality (Goodman, Neamtiu, Shroff, and White (2013)), earnings quality (Demerjian, Lev, and McVay (2012)), abnormal returns (Hayes & Schaefer, 1999), and goodwill impairment (Sun (2016)).

Managers' abilities also play an important role in corporate investments since they usually require a huge cash flow amount and a long time horizon. Chemmanur, Imants, and Karen (2009) present evidence showing that better managers are more capable of identifying high NPV projects, and therefore the scale of investment will also be larger. Lin, Lin, Song, and Li (2011) show that chief executive officer (CEO) characteristics such as professional background and education level have significant effects on a corporate's research and development (R&D) input and output. Andreou, Ehrlich, Karasamani, and Louca (2016) investigate corporate investment during the 2008 financial crisis period and find that it is positively related to pre-crisis managerial ability, because of finance security. However, exiting studies mostly focus on the level of investment, but not investment opportunity.

According to Myers (1977), the market value of a firm is composed of the value of assets on hand and the value of investment opportunity, which is unobservable and depends on future investments. There are four common proxies for investment opportunity: market-to-book, market-to-equity, the earnings-price ratio, and the ratio of capital expenditure over the net value of plant, property, and equipment. Adam and Goyal (2008) show that the market-to-book ratio, or the closely related measure used in a great deal of studies, Tobin's q,[2] contains the highest information content with regard to investment opportunity. We adopt the new measure proposed by Peters and Taylor (2017), Total q, to be our proxy for investment opportunities. The main improvement of Total q is that it considers both physical and intangible assets and is gaining importance in the recent development of service and high-tech industries. Peters and Taylor (2017) prove that Total q is a better measure with respect to investment opportunity than Tobin's q and other existing proxies. Taken together, we expect that firms with superior managers should be associated with higher investment opportunities, since they can more efficiently manage their resources and implement new projects better. We propose our first hypothesis as follows.

Hypothesis 1. *Managerial ability is positively related to a firm's investment opportunities*.

Aside from Hypothesis 1, we argue that the relationship between managerial ability and investment opportunity can vary across industry, firm circumstances, and time periods. Holcomb, Holmes, and Connelly (2009) find that managerial ability affects resource productivity, but the relationship is mitigated by an increase in the human resource quality of the company. Cornaggia, Krishnan, and Wang (2016) find that the relationship between managerial ability and credit rating is significant only in the subsample consisting of firms above the median distress level. Andreou et al. (2016) show that the positive relation between managerial ability and investment during a crisis period is significant only with firms operated by CEOs with general managerial skills. Since managers need enough financial flexibility to capture investment opportunities and realize growth, we propose our second hypothesis as follows.

Hypothesis 2. *The relationship between managerial ability and investment opportunity is more pronounced in firms with a good financial position*.

3. Research design

3.1. Data and sample construction

To examine the relationship between investment opportunity and managerial ability, we adopt unbalanced firm-level panel data for the period 1988–2015. Our study begins in 1987, because it is the first fiscal year when financial data are available in our database, and end in 2015, because of the availability of MA-score data. We obtain accounting data from COMPUSTAT to construct the financial ratio as a control variable and a measure of financial constraint. All variables are winsorized at the 5th and 95th percentiles. The measurement of managerial ability we adopt in this study is provided by Peter Demerjian on his website.[3] Total q is acquired from WRDS as our measure of investment opportunities. After we exclude the utility sector (SIC code: 490–499) and financial industry (SIC code: 600–699), since these companies are more regulated and may show different patterns in investment opportunities, we obtain a final sample of 159,448 firm-year observations.

3.2. Measurement

3.2.1. Managerial ability

We employ the managerial ability (*MA-score*) measure developed by Demerjian, Lev, Lewis, and McVay (2012), which captures the efficiency of a firm's managers to generate revenue through certain inputs. According to their theory, higher ability managers should be able to generate higher revenues from a given set of resources than their counterparts in the same industry. They introduce a two-step approach to evaluate firm efficiency, from which the managerial ability score is extracted.[4]

We believe that the MA-score measure is an appropriate proxy for managerial ability since it has been proven by several valid tests in prior studies (Demerjian, Lev, and McVay (2012); Cornaggia et al. (2016)). The Ma-score enables us to study the effect of managerial

[2] The most commonly used proxy for investment opportunity is Tobin's q, which shows the ratio of a firm's market value over the book value of assets in place (Modigliani and Miller (1958)). One disadvantage of Tobin's q is that it can be affected by measurement error, as shown in Erickson and Whited (2000).

[3] The MA-score data are available at: http://faculty.washington.edu/pdemerj/data.html

[4] For a detailed construction of the MA-score, please refer to Appendix C.