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Do able managers take more risks?

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ABSTRACT

Empirical evidence on the relation between managers and risk is mixed, with data mostly from developed countries, and aggregated risk measures are used in the study of this relation in the existing literature. The purpose of this study is to examine how managerial ability affects idiosyncratic risk taking, especially in innovative firms in China, which is the largest developing country in the world. Using Demerjian et al.'s (2012) measure of managerial ability and a sample of Chinese firms from 2009 to 2019, we observe a positive relationship between managerial ability and idiosyncratic risk based on fixed effects models. The findings are robust to endogeneity concerns. Subsample analyses reveal that the positive relation between managers and idiosyncratic risk is more pronounced when there is greater earnings pressure and/or when there are information gaps, whereas such a positive relation is less pronounced at higher innovation levels due to less earnings pressure in the short run and a greater focus on long-term growth through technological innovation. In addition, we find that managerial ability has a positive impact on firm value, yet this positive effect is weakened with higher levels of idiosyncratic fluctuation. Our study has implications for agency theory in that managerial ability, which may come with additional agency problems and heterogeneous risk-taking incentives, can have a negative impact on firm value if the able managers' risk-taking motivations and behaviors are not adequately monitored or constrained.

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Introduction

The international evidence with regard to the nature of the relationship between managers and risk provides clear yet opposing predictions like either a positive correlation (for example, Chemmanur et al., 2009; Cremers & Petajisto, 2009; Chen, Podolski, & Veeraraghavan, 2015; Andreou et al., 2017; Yung & Chen, 2018) or a negative correlation (e.g., Bonsall et al., 2017; Cornaggia et al., 2017), but most of these studies make no distinction between idiosyncratic and systematic risks. Given that business managers can control for firm-specific risks but not systematic risks, by managing business strategy adjustments, there is more to be taken into account by managers in making portfolio risk decisions, and thus, it becomes vital to explain managerial strategies in assuming idiosyncratic risks. Therefore, the important question regarding how talented managers influence idiosyncratic volatility remains unanswered. Furthermore, it is also interesting to investigate the relation between managers and idiosyncratic risk in firms with more innovation since innovation is inherently risky, prone to failure, and resource consuming. This study aims to address the above issues.

There exist two competing predictions behind the managerial motives of undertaking risk. The 'efficient contracting view' postulates that firms with able managers are expected to minimize idiosyncratic uncertainty while achieving superior performance. On the one hand, superior knowledge enables high-ability managers to anticipate firms' prospects and thereby adjust accruals and operations strategies to reduce the volatility of reported earnings (e.g., Bonsall et al., 2017; Demerjian et al., 2012; Demerjian et al., 2013). On the other hand, high-ability managers hope to deliver their superior skills with more stable future earnings streams and less variable future returns (e.g., Ali & Zhang, 2015; Breeden & Viswanathan, 2016; Doukas & Zhang, 2020; Bai et al., 2021). However, the 'rent-extraction view' argues that able managers take on more risk to their advantage, suggesting that managerial ability is positively correlated with idiosyncratic risk for firms with able managers. Able managers under earnings pressure strive to increase current profits by undertaking projects with high uncertainty (for example, Hirshleifer, 1993; Hirshleifer & Thakor, 1992; Jian & Lee, 2011; Zhang & Gimeno, 2010). In particular, by undertaking rent-seeking opportunistic behavior when the benefit(s) of such behavior outweigh its cost(s), able managers may care less about the impact of their rent-seeking opportunistic behavior on the market value of their own human capital (see, e.g., Mishra, 2014; Wang et al., 2017; Cheng & Cheung, 2021), which naturally leads to more risk taking.

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These two alternative explanations have quite different economic interpretations and policy implications. The 'efficient contracting view' suggests that the negative relation between managers and idiosyncratic risk is a result of the optimal investment decision made by the firm to maximize total firm value. The competing explanation, however, suggests that the positive relation between managers and idiosyncratic risk is a consequence of the agency problem and reflects a distortion of the firm's first-best investment decision. These mixed theoretical possibilities motivate our empirical investigation.

China's capital market offers us an opportunity to investigate these issues. First, firms in developing countries generally have lower effectiveness in terms of managing business processes than do their counterparts in developed countries like the U.S., which indicates that managerial traits, such as capabilities, may play an even more important role in the choice of corporate policies in these countries, such as China. Additionally, top executives can fully utilize their ability to generate desirable outcomes only when they are provided with high levels of discretion and/or power (Cheung et al., 2017; Hambrick & Quigley, 2014). Companies in developing countries such as China generally operate in environments with weaker investor protection and legal systems, implying that managers in these countries have more discretion to exercise their influence on financial decisions and thus economic outcomes.

We measure managerial ability using a proxy presented by Demerjian et al. (2012) and then run firm-level regressions, pooling Chinese data. Our study finds a significantly positive association between managerial ability and idiosyncratic risk after controlling for standard firm-level factors as well as firm-year fixed effects. This positive association is robust to endogeneity concerns. Moreover, we seek to understand the economic mechanisms through which managerial ability can affect idiosyncratic risk. We find that the positive relation between managers and idiosyncratic risk is more pronounced in the presence of greater earnings pressure and information gaps, whereas such a positive relation is less pronounced in highly innovative firms. In detail, able managers under earnings pressure strive to increase current profits by undertaking projects with high idiosyncratic risk, and the risk-seeking activities of able managers may be exacerbated with an increase in information asymmetry. In addition, more able managers in innovative firms do not necessarily undertake projects with high idiosyncratic risk, which is a type of short-term risk, because such managers tend to focus on the long-term strategic plan for technological innovations and face little short-term earnings pressure. Further analyses show that managerial ability has a positive impact on firm value, yet this positive effect is weakened with higher levels of idiosyncratic fluctuation. Overall, the collective evidence supports the 'rent-extraction view'.

Our study makes contributions to the literature in four dimensions. First, we study the relationship between managerial ability and idiosyncratic risk, which is different from existing studies on the relation between managerial ability and aggregated risk in the literature. Second, we provide new evidence on the relation between managers and uncertainty due to the agency problem. A unique advantage of studying the impact of managerial ability in the context of risk taking is that the literature on agency problems provides opposite predictions for managerial risk choices: one strand of the literature shows that insiders avoid taking risks because of the large exposure to their firms (e.g., John et al., 2008), and another strand suggests that insiders prefer to take excessive risks because of tunneling distortion (e.g., Johnson et al., 2000). However, the above literature ignores managerial heterogeneity. In fact, there are significant differences in job security, reputation, and earnings expectations between high- and low-ability managers, which is important for understanding managerial risk choices, as shown in our findings. Third, our study also contributes to the literature on managerial ability by finding evidence on the factors moderating the effect of managerial ability. Specifically, the manager-idiosyncratic risk relation varies with earnings

pressure, information asymmetry, and innovation levels. Finally, we add knowledge to the evidence on the dark side of managerial ability (for example, Cheng & Cheung, 2021; Gul et al., 2018; Mishra, 2014) by showing its negative impact on firm value through higher idiosyncratic risk taking.

Theory and hypotheses

Idiosyncratic risk is the component of aggregate risk that can be affected by firm actions rather than overall market conditions (Brown & Kapadia, 2007), which reflects the choice of a project with an unknown expected return in the investment decisions of companies. The link between strategic firm decisions and idiosyncratic risk has been studied in several related contexts Ang et al. (2009). argue that the degree of idiosyncratic risk depends on firm-specific characteristics. Following this interpretation, subsequent researchers examine the determinants of idiosyncratic risk, including information disclosure (Benlemlih et al., 2018; Boudoukh et al., 2018), tax strategies (Chaudhry, 2021), payout policy (Lee & Mauck, 2016), social investment (Lins et al., 2017) and so on.

However, the abovementioned studies ignore the role played by managers in idiosyncratic risk. Managerial ability has been shown to play an important role in abnormal returns (Hayes & Schaefer, 1999), earnings quality (Demerjian et al., 2013), earnings management (Demerjian et al., 2017), acquisition quality (Goodman et al., 2014), debt maturity (Khoo & Cheung, 2022), credit risk (Bonsall et al., 2017), investment opportunity (Lee et al., 2018), and strategic entry into a new market (Goldfarb & Xiao, 2011), which are all correlated with firm risk.

Recently, one strand of the literature has revealed that risk-taking is an essential element of the managerial role. For example, surveys of business executives conducted in earlier investigations find that managerial risk-taking propensities vary across individuals, and the variation across managers appears to be related to personality traits and experience (Maccrimmon & Wehrung, 1986; Shapira, 1986). Empirical studies find a robust relation between managerial skills and the uncertainty of firms' future profitability. Regardless of the growing body of empirical evidence with regard to the notion of managerial impact on the uncertainty of firms' future profitability, there exist two competing hypotheses regarding the potential impact of managerial ability on volatility risk. Therefore, further studies are needed to analyze the contradictory theoretical perspectives and evidence on idiosyncratic risk taking.

The efficient contracting hypothesis proposes that managerial ability is negatively associated with idiosyncratic risk. There are a number of explanations that support this view. First, high-ability managers have the ability to anticipate firms' prospects, thereby adjusting accruals and operations strategy to reduce the volatility of reported earnings (and increase firm value). More able managers exhibit better knowledge of technology and industry trends, more reliably estimate product demand, choose more valuable projects, manage employees more efficiently, and have a deeper understanding of risk than do their less able counterparts (Demerjian et al., 2012; Demerjian et al., 2013). The ability to understand the operating environment enables high-ability managers to better manage business model shocks and deliver better outcomes with lower variance (Bonsall et al., 2017). Second, high-ability managers desire better outcomes with lower variance to ensure that the market quickly discovers their superior abilities. Smooth and stable earnings have emerged as a reliable signal of both firm and executive value, allowing managers to communicate their expertise and let the market assess their managerial ability efficiency (e.g., Ali & Zhang, 2015; Breeden & Viswanathan, 2016; Doukas & Zhang, 2020; Bai et al., 2021). The international evidence indicates that idiosyncratic risk often accounts for a larger proportion of the variation in total returns (Chun et al., 2008; Miralles-Marcelo et al., 2012), and high levels of idiosyncratic risk

generally lead to small future returns (Ang et al., 2006, 2009; Chen & Petkova, 2012; Gu et al., 2018; Shi et al., 2016). Therefore, able managers are able to use their superior knowledge and skills to overcome additional variation associated with revenue growth, thus delivering more stable future earnings streams and less variable future returns. As such, a negative relationship should exist between managerial ability and idiosyncratic risk. Thus, we propose the following hypothesis:

Hypothesis 1: Based on the “efficient contracting view”, more able managers are associated with lower idiosyncratic risk.

However, the risk-extraction view argues that able managers have an advantage, suggesting that managerial ability is expected to be positively related to firm-specific risks. Given the certification effect of managerial ability on firm value (Chemmanur & Paeglis, 2005), able managers are expected to carry more earnings expectations from shareholders and other stakeholders, which naturally leads to their increased appetite for risk. In general, corporate earnings have implications for managers' future returns, including their compensation, autonomy, and promotion likelihood (Arslan-Ayaydin et al., 2020; Garay et al., 2007; Skinner & Sloan, 2002). Since high risk is often associated with high returns, able managers hope to achieve risk premiums through higher levels of idiosyncratic risk taking to achieve their performance benchmarks. In particular, able managers tend to be confident in their ability to take desirable, controlled risks in the process of creating value and hence take more risk overall (Andreou et al., 2017). In addition, high-ability managers under earnings pressure place greater priority on short-term profitable investments over the long-term growth of the firm through technological innovation and gamble for greater economic rents in the short term. Managers often complain that capital market expectations shift their focus toward current earnings and away from long-term strategic commitments (Hirshleifer, 1993; Hirshleifer & Thakor, 1992; Jian & Lee, 2011; Zhang & Gimeno, 2010). These business strategy adjustments may increase the volatility of the firm's future profitability and even have an adverse effect on its ability to resist risk.

It seems reasonable to expect that high-ability managers care less about the adverse impact of their opportunity risk-seeking behavior on the firm than they do about the market value of their own human capital, as they tend to have a better outside option in the job market relative to their low-ability counterparts (Cheng & Cheung, 2021). Consistent with this view, Mishra (2014) indicates that managers with greater generalist skills have no fear of finding a new job due to a greater demand for generalist skills in the market. Consequently, such managers are likely to engage in risky activities that are beneficial for their personal objectives at the expense of shareholders. Furthermore, high-ability managers can implement opportunistic rent-seeking strategies with a lower likelihood of detection. For example, Wang et al. (2017) suggest that regulatory agencies can carry out relatively more diagnostic investigations of firms with low-ability managers relative to those of firms with high-ability managers, which leads to the decreased likelihood of scrutinization and sanction by regulatory agencies on firms with high-ability managers. All these reasons maximize the net benefits of more able managers in opportunistic risk-taking activities. Based on the above discussion, we thus posit the following hypothesis:

Hypothesis 2: Based on “the risk-extraction view”, more able managers are associated with higher idiosyncratic risk.

Methodology

Data collection

We use a sample of Chinese listed firms from 2009 to 2019. The sample is chosen based on the requirement that data are available to compute the managerial ability and earnings pressure variables. To

avoid an exogenous shock on firms' policies caused by the 2008 financial crisis, 2009 is chosen as the beginning year.

We collect data for estimation from a number of sources. Stock and market return data and accounting data for all nonfinancial companies are drawn from the China Stock Market and Accounting (CSMAR) database. The WIND economic database provides foreign currency income data. We obtain the level of the business innovation environment of China's provinces and regions from the Annual Report of Regional Innovation Capability of China. The sample excludes financial firms or those observations with missing data, resulting in a total of 5,498 firm-year observations. All continuous variables are winsorized at intervals of 1% and 99%.

Multivariate analyses

To test Hypothesis 1, we propose a panel data model that enables us to estimate the impact of managerial ability on idiosyncratic risk

$$IVOL_{i,t} = \alpha_0 + \alpha_1 MA_{i,t} + \sum Control_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

The independent variable, *IVOL*, represents idiosyncratic risk defined as the yearly standard deviation of the regression daily residuals of the Fama-French (1993) three-factor model.¹ The dependent variable, *MA*, is managerial ability using the measure of Demerjian et al. (2012).² Following Ferreira and Laux (2007) and Abdoh and Varela (2017), *Control* is used as a vector of firm-specific individual indices related to idiosyncratic risk: financial leverage (*Lev*), firm size (*Size*), operating leverage (*OL*), stock turnover rate (*Turnover*), firm age (*Age*), dividend payout indicator (*Div*), market-to-book ratio (*MB*), profit margin (*PM*), board size (*Bsize*), and the proportion of independent board directors (*Indep*).

Parameters μ and λ refer to firm and year fixed effects, respectively. The coefficient on *MA* captures the relation between managerial ability and idiosyncratic risk. If Hypothesis 1 holds, then we expect a negative coefficient for *MA*. If it does not hold, then a positive coefficient is expected for Hypothesis 2.

Descriptive data

Panel A of Table 1 reports the descriptive statistics for the full sample. The average *MA* value is 0.001, with a standard deviation of 0.100 and a median of -0.017. The mean (median) value of *IVOL* is 1.541 (1.356). We split the full sample into the High_ *MA* and Low_ *MA* subgroups based on managerial ability and present the descriptive data for the two subsamples in Panel B. Idiosyncratic volatility and earnings pressure are both higher for more ably managed firms. The mean and median differences between the two groups are significant at the 1% level. Panel C displays the descriptive statistics with respect to firm innovation. A clear pattern emerges from these panels; in particular, we find that managers in highly innovative firms have less earnings pressure and lower idiosyncratic risk than do their industry peers. The tests for differences in the mean and median values confirm that these scores are significantly different from each other.

We also present the Pearson correlation coefficients in Table 2. The correlation between *MA* and *IVOL* is positive and significant at the 1% level, suggesting that high-ability managers take more firm-specific risks relative to industry peers than do their low-ability counterparts. The correlations between the variables never exceed (the absolute value of) 0.6, and their variance inflation factors do not

¹ We also use the Fama-French 5-factor model for constructing the proxy of idiosyncratic risk and observe qualitatively similar results.

² We also employ three alternative measures used as managerial ability proxies in previous research, namely, the average of industry-adjusted ROA over the last three years, the average value of *MA* from year *t-1* to year *t*, and decile managerial ability measure. The main findings still hold.

Table 1
Descriptive statistics.

Panel A: Full sample							
Variable	Mean	Median	Max	Min	SD	P25	P75
<i>IVOL</i>	1.541	1.356	5.268	0.445	0.823	1.008	1.886
<i>MA</i>	0.001	-0.017	0.498	-0.165	0.100	-0.060	0.038
<i>Lev</i>	0.442	0.439	0.860	0.071	0.191	0.301	0.590
<i>Size</i>	22.519	22.321	26.315	20.254	1.256	21.663	23.304
<i>OL</i>	0.214	0.191	0.610	0.007	0.135	0.105	0.299
<i>Turnover</i>	5.440	4.196	26.951	0.606	4.239	2.520	7.140
<i>Age</i>	2.208	2.303	3.258	0.693	0.671	1.792	2.833
<i>Div</i>	0.788	1	1	0	0.409	1	1
<i>MB</i>	1.966	1.607	6.877	0.877	1.089	1.241	2.264
<i>PM</i>	0.104	0.087	0.471	-0.214	0.097	0.049	0.144
<i>Bsize</i>	2.256	2.303	2.708	1.792	0.168	2.079	2.303
<i>Indep</i>	0.375	0.333	0.571	0.333	0.055	0.333	0.429

Panel B: Two subgroups with respect to managerial ability						
Variable	High_MA		Low_MA		Difference tests	
	Mean	Median	Mean	Median	Mean	Median
<i>IVOL</i>	1.552	1.406	1.451	1.295	3.732***	4.872***
<i>Gap</i>	0.049	0.030	0.042	0.024	2.751***	3.757***

Panel C: Two subgroups with respect to firm innovation						
Variable	High_Inn		Low_Inn		Difference tests	
	Mean	Median	Mean	Median	Mean	Median
<i>IVOL</i>	1.498	1.345	1.547	1.354	-3.386***	-2.087**
<i>Gap</i>	0.045	0.025	0.045	0.029	-1.870*	-2.088**

Note: This table presents the descriptive statistics for the whole sample (Panel A) as well as for the subgroups (Panels B and C). The subsamples in Panels B to C are formed based on the industry-year median level of managerial ability and firm innovation, respectively. The t test results are for mean differences, and Wilcoxon signed-rank test results are for median differences. All continuous variables are winsorized at the top and bottom 1% levels. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively. See the [Appendix](#) for variable definitions.

exceed 3, indicating that multicollinearity is unlikely to be an issue in our multivariate tests.

Data analysis

Benchmark results

The estimation results of Eq. (1) are reported in Column (1) of Table 3 and show that the estimated coefficient on *MA*, i.e., α_1 in Eq. (1), is positive and significant at the 1% level. In terms of economic significance, the value of idiosyncratic volatility for firms with a one-unit increase in *MA* increases by 0.602 units, which is equivalent to 39.07% of the mean value of *IVOL*. The findings strongly corroborate Hypothesis 2. The coefficients on the control variables are generally consistent with the prior literature. In detail, idiosyncratic risk is positively related to firm size, stock turnover rate, firm age, and market-to-book ratio, while it is negatively related to dividend payout and profit margin.

Robustness tests: propensity score matching (PSM) analysis

A potential endogeneity concern that our model may suffer from an omitted variable that is correlated with both managerial ability and idiosyncratic risk emerges. We use the propensity score matching method to alleviate this potential endogenous selection on observable variables. The technique creates firm-year pairs with a set of similar characteristics that affect the volatilities of cash flow and accounting return (i.e., *ROA*) but differ in their level of managerial ability.

In implementing this method, we first carry out logistic regression to estimate the probability that a firm has high-ability managers. We

rely on chosen firm and industry characteristics that have been employed in the recent literature (e.g., Cheung et al., 2017; Custodio et al., 2013; Wang et al., 2017) as potential determinants of managerial ability, including firm size (*Size*), leverage (*Lev*), growth (*BM*), and sales-based Herfindahl index (*HHI*). We then employ the nearest-neighbor technique of propensity score matching without replacement for a control firm. This procedure returns 4,434 samples with 2,217 matching pairs of treatment and matching control firms. Based on these matched samples, we rerun Eq. (1), the results of which are shown in Column (2) of Table 3. We observe that the coefficient on *MA* is positive and significant at one percent, which demonstrates that omitted variables related to nonlinear forms of our control variables are unlikely to drive our findings.

Robustness tests: two-stage Heckman model

To resolve unobserved correlated omitted variable or self-selection bias problems, we rely on the two-stage Heckman (1976) procedure. In the first stage, we use a probit model to calculate the inverse Mills ratio (*IMR*), the probability of an able manager choosing a firm. We regress *MA_dmy*, defined as the dummy variable equal to one if *MA* is above the industry-year median and zero otherwise, on firm size (*Size*), leverage (*Lev*), growth (*BM*), and sales-based Herfindahl index (*HHI*) as potential determinants of managerial ability for the purpose of estimating the *IMR* value. In the second stage, we run Eq. (1) with the inclusion of *IMR* as an additional control variable. Column (3) illustrates that after controlling for *IMR*, the coefficient on managerial ability is still positively significant at a level of 1%. Thus, the results from this analysis suggest that our results are robust to the issues of the correlated omitted variable or self-selection bias.

Table 2
Correlation matrix.

Variable	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
V1: IVOL	1											
V2: MA	0.114***	1										
V3: Lev	-0.029**	0.093***	1									
V4: Size	-0.106***	0.092***	0.534***	1								
V5: OL	-0.036***	-0.109***	0.011	-0.037***	1							
V6: Turnover	0.425***	0.009	-0.126***	-0.357***	0.012	1						
V7: Age	-0.068***	0.002	0.326***	0.436***	-0.012	-0.293***	1					
V8: Div	-0.084***	-0.026*	-0.139***	0.084***	-0.019	-0.036***	-0.136***	1				
V9: MB	0.355***	0.042***	-0.339***	-0.413***	-0.068***	0.198***	-0.088***	-0.014	1			
V10: PM	0.008	0.147***	-0.312***	-0.032**	-0.084***	-0.021	-0.069***	0.263***	0.236***	1		
V11: Bsize	-0.075***	-0.001	0.128***	0.209***	0.098***	-0.074***	0.138***	0.031**	-0.118***	0.003	1	
V12: Indep	0.017	-0.005	0.038***	0.092***	-0.030**	-0.025*	0.004	-0.006	0.017	-0.014	-0.481***	1

Note: This table shows the correlation matrix of the main variables. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The impact of earnings pressure on the risk effect of managerial ability

As discussed earlier in the “Theory and hypotheses” section, we argue that able managers under earnings pressure strive to increase current profits by undertaking projects with high idiosyncratic uncertainty. Therefore, we examine whether the impact of managerial ability is conditional on the level of earnings pressure.

We examine the role of the pressure felt by able managers in moderating the relationship between managerial ability and idiosyncratic risk using subgroup analysis. First, we adopt a method developed by Zhang and Gimeno (2010) and measure the earnings pressure indicator (*Gap*). The earnings pressure experienced by firm *i* during year *t* is defined as the difference between analysts’ EPS forecast consensus for year *t*, measured at the beginning of the year, and

the potential EPS estimate (Matsumoto’s (2002) measure at the beginning of the year), standardized by the firm’s stock price at the beginning of the year. Potential EPS is calculated as the sum of expected changes in EPS and EPS in the prior year. Second, all firms are sorted into two subgroups based on earnings pressure. In detail, a firm is assigned to the high-pressure subgroup (High_Gap) if the value of *Gap* is above the industry-year median and to the low-pressure subgroup (Low_Gap) otherwise.

We re-estimate Eq. (1) and report the results in Columns (1) and (2) of Table 4. As expected, the results show that a coefficient on *MA* for the High_Gap subgroup is positive and significant at the 10% level but nonsignificant for the Low_Gap subgroup. Our findings suggest that earnings pressure has a greater impact on managerial idiosyncratic risk-seeking activities in firms with high-ability managers than in firms with low-ability managers in the

Table 3
Effect of managerial ability on idiosyncratic risk.

Variable	-1	(2) PSM approach	(3) Heckman procedure
MA	0.602***	0.520***	0.483***
Lev	-3.56	-2.7	-2.96
Size	0.123	0.257	0.301**
OL	-0.83	-1.6	-2.11
Turnover	0.085*	0.119**	0.111**
Age	-1.67	-1.99	-2.16
Div	0.0701	0.205	0.075
MB	-0.38	-1	-0.42
PM	0.080***	0.086***	0.082***
Bsize	-16.51	-15.15	-16.88
Intercept	0.199***	0.151*	0.177***
Fixed effects	-2.91	-1.94	-2.58
N	-0.119***	-0.108***	-0.122***
adj. R ²	(-3.81)	(-3.01)	(-3.95)
	0.273***	0.278***	0.296***
	-12.18	-11.4	-12.78
	-0.330*	-0.176	-0.115
	(-1.69)	(-0.91)	(-0.60)
	-0.007	-0.168	-0.123
	(-0.04)	(-0.88)	(-0.80)
	0.221	0.149	0.076
	-0.55	-0.32	-0.19
	-1.984*	-2.456*	-3.150***
	(-1.82)	(-1.94)	(-2.83)
	Yes	Yes	Yes
	5,498	4,434	5,262
	0.402	0.366	0.371

Notes: This table presents the results for the interplay between managerial ability (*MA*) and idiosyncratic risk (*IVOL*). Column (1) reports the results for the baseline regression using a firm-year fixed effects model. The rest of the columns present the results for robustness tests. Column (2) presents the results from a propensity score matching analysis. Column (3) presents the results from the second-stage regression of the two-stage Heckman regression model. The *t*-statistics in parentheses are computed based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4
Moderating conditions of the effect of managerial ability.

Variable	High_Gap	Low_Gap	High_Inf	Low_Inf	High_Inn	Low_Inn
MA	0.681*	0.316	0.580***	0.502*	0.217	0.642***
Lev	(1.83)	(0.96)	(2.72)	(1.83)	(0.62)	(3.23)
Size	-0.353	0.351	0.115	-0.110	0.115	-0.126
OL	(-1.26)	(0.90)	(0.48)	(-0.49)	(0.43)	(-0.61)
Turnover	-0.014	0.211**	0.057	0.133	0.173	0.0506
Age	(-0.19)	(2.05)	(0.88)	(1.63)	(1.62)	(0.74)
Div	0.263	1.009**	0.168	-0.042	0.211	-0.0565
MB	(0.79)	(2.05)	(0.59)	(-0.13)	(0.71)	(-0.22)
PM	0.091***	0.092***	0.079***	0.084***	0.0778***	0.0814***
Bsize	(9.25)	(6.51)	(11.62)	(11.40)	(9.65)	(12.12)
Intercept	0.294*	0.174	0.082	0.523***	0.138	0.320***
Fixed effects	(1.74)	(0.95)	(0.89)	(4.09)	(1.12)	(3.44)
N	-0.073	-0.177*	-0.093*	-0.193*	-0.0583	-0.149***
adj. R ²	(-1.20)	(-1.89)	(-1.76)	(-4.25)	(-1.00)	(-3.60)
	0.218***	0.253***	0.194***	0.363***	0.269***	0.268***
	(6.37)	(4.60)	(7.01)	(8.95)	(7.43)	(8.31)
	-0.331	-0.172	-0.570*	-0.138	-0.304	-0.253
	(-0.82)	(-0.36)	(-1.77)	(-0.48)	(-0.97)	(-0.93)
	0.022	0.283	0.068	-0.190	0.260	-0.153
	(0.09)	(0.84)	(0.24)	(-0.73)	(1.00)	(-0.69)
	0.034	-0.113	0.703	-0.720	0.346	0.315
	(0.05)	(-0.16)	(1.22)	(-1.04)	(0.57)	(0.53)
	0.314	-5.745**	-1.325	-2.962	-4.587*	-0.960
	(0.18)	(-2.40)	(-0.98)	(-1.56)	(-1.96)	(-0.71)
	Yes	Yes	Yes	Yes	Yes	Yes
N	1,718	1,246	3,099	2,399	2,234	3,264
adj. R ²	0.401	0.385	0.356	0.391	0.344	0.380

Notes: The table reports the results of subsample analyses. Columns (1) and (2) show the results of the impact of earnings pressure on the relation between managerial ability and idiosyncratic risk. Columns (3) and (4) show the results of the role of information asymmetry. Columns (5) and (6) show the results of the role of firm innovation. The *t*-statistics in parentheses are computed based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

same industry. To meet earnings expectations, able managers more actively engage in risky corporate undertakings that aim to make short-term gains or make up for the losses generated by other business operations.

Impact of the information gap on the risk effect of managerial ability

During the development of Hypothesis 2, we conjecture that the risk-seeking activities of able managers may be exacerbated when the information gap between managers and investors is expected to be high. Therefore, we further examine whether the impact of managerial ability is conditional on the level of information asymmetry.

We also test the moderating role of information asymmetry based on the regression approach, similar to the above. The variable *Inf* is constructed to measure the level of information asymmetry, which is calculated as the natural logarithm of one plus the number of financial analysts following the company. We then sort a firm into the high (low) asymmetry subgroup if its *Inf* value is smaller (higher) than the industry-year median. The results in Columns (3) and (4) of Table 4 show that the positive coefficients on managerial ability are significant at either the 1% or 10% level, whereas there is a greater significance level for *MA* in the High_Inf subgroup than in the Low_Inf subgroup. The results are consistent with our expectations that the positive effect of managerial ability is exacerbated by more information asymmetry.

Impact of innovation on the risk effect of managerial ability

One may argue that the risk effect occurs because firms with talented managers are more inclined to engage in firm innovation. Innovation is inherently risky, prone to failure, and resource consuming. Due to greater labor market options for skilled managers, such managers may also be willing to take greater innovation-related risks and thereby be less averse to undertaking innovation projects (Kraiczky et al., 2015; Lin et al., 2021). For example, Yung and Chen (2018) find that CEOs with higher managerial ability are receptive to risk taking and spend more on R&D projects, while CEOs with lower managerial ability may refrain from risk taking and reduce R&D expenses. If such doubt holds, then we can observe a higher significance level of the coefficient on *MA* in highly innovative firms. Conversely, highly innovative firms focus on long-term growth through technological innovation, and managers have less earning pressure in the short run and are less likely to take on short-term risky projects. Then, *MA* may not have a significant effect on the short-term risk level measured by *IVOL*.

We further employ subsample analysis to examine whether the impact of managerial ability is conditional on the degree of firm innovation. Following Taques et al. (2021), we use patents as an indicator of the innovation outcome (*Innovation*) and then split the full sample into a high_innovation (High_Inn) subsample and a low_innovation subsample (Low_Inn) based on the industry-year median of *Innovation*. The results in Columns (5) and (6) of Table 4 show that a coefficient on *MA* for the Low_Inn subgroup is positive and significant at the 1% level but nonsignificant for the High_Inn subgroup. Recall that the difference tests in Panel C of Table 2 confirm that managers in innovative firms have less earnings pressure than do their peers. Based on the above discussion, managers in firms with high innovation are expected to focus on the long-term strategic plan for the technological innovation of their firms and to be less likely to take on short-term risky projects.

This result consists of our earlier finding that earnings pressure is the main driving force for able managers to take on riskier projects since managers in lowly innovative firms have more earning pressures than do those in highly innovative firms.

Effect of the idiosyncratic risk-seeking activities of able managers on firm value

A notable problem is that an increase in idiosyncratic volatility is not necessarily bad news for shareholders. Real option theory indicates that an increase in firm risk has an incremental effect on firm value (Black & Scholes, 1973). From the perspective of principal-agent theory, any increase in firm risk can be beneficial to shareholders in certain situations. For example, the stockholders of leveraged firms have incentives to increase firms' riskiness to transfer wealth from bondholders to them (Jensen & Meckling, 1976; Myers, 1977). Additionally, Ljungqvist (1994) notes that speculative trades can be used to distort profits and, hence, manipulate stock prices to shareholders' advantage. These studies suggest that able managers wield their ability to maximize shareholder wealth by increasing firms' exposure to risk. Thus, an increase in shareholders' value is expected to be observed in more ably managed firms with more risk. This finding means that able managers use risk-taking activities as a tool to pursue shareholders' value rather than their own interest. To examine this issue, we specify the following equation:

$$Q_{i,t} = \gamma_0 + \gamma_1 MA_{i,t} + \gamma_2 IVOL_{i,t} + \gamma_3 MA_{i,t} \times IVOL_{i,t} + \sum \text{Control}_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (2)$$

where the dependent variable (*Q*) refers to Tobin's *Q*, which captures firm value. As before, *MA* is calculated using Demerjian et al. (2012) measure. For control variables, we follow prior research (Chakravarty & Hegde, 2019; Kang et al., 2017) and include the determinants of Tobin's *Q*, namely, firm size (*Size*), leverage ratio (*Lev*), sales growth (*Growth*), capital expenditure (*Capital*), the degree of diversification (*Segments*), return on assets (*ROA*), free cash flow (*FCF*), institutional holdings (*Insti*), firm age (*Age*) and R&D expense (*R&D*), in firm-level regression. If there is a positive effect of managers on firm value, then the expected coefficient on *MA* × *IVOL* is positive and significant.

Table 5 reports the results. We find that the estimated coefficient of *MA* is positive and significant at the 5% level, lending support to the view that managerial ability is associated with higher firm value. This observation is consistent with previous research (e.g., Cheung et al., 2017; Yung & Chen, 2018). Notably, the coefficient on its interaction with idiosyncratic risk is negative and significant at the 10% level, meaning that the positive impact of managerial ability on firm value is weakened when idiosyncratic fluctuation is exacerbated. To demonstrate this, we take the first derivative of Eq. (3) with respect to *MA*, and obtain the following:

$$\frac{\partial Q_{i,t}}{\partial MA_{i,t}} = \gamma_1 + \gamma_3 IVOL_{i,t} \quad (3)$$

The above expression clearly shows that the overall impact of managerial ability on firm value is no longer a constant but a variable, the impact of which can be positive, negative, or even zero, depending on γ_1 , γ_3 , and *IVOL*. If we set the above equation to zero and solve for *IVOL*, then the threshold for *IVOL* is equal to 1.833 (0.594/0.324), which is slightly lower than the 75th percentile value of *IVOL*. That is, the value effect of managerial ability is positive (negative) before (after) the value of *IVOL* reaches 1.833. Thus, we find no evidence to support the idea that able managers act in their stockholders' interest by undertaking greater idiosyncratic risk.

Discussion and conclusions

Discussion and contributions

The international evidence with regard to the nature of the relationship between managers and risk is limited and mixed; however,

Table 5
Value effect of managerial risk-seeking activity

Variable	Q
MA	0.594** (1.98)
IVOL	0.213*** (8.80)
MA × IVOL	-0.324* (-1.94)
Growth	0.014 (0.22)
Lev	0.088 (0.34)
Cash	0.308 (1.10)
AGE	0.902*** (7.29)
Size	-1.081*** (-11.41)
First	0.323 (0.76)
Soe	-0.112 (-0.77)
Intercept	24.185*** (11.58)
Fixed effects	Yes
N	5,201
adj. R ²	0.314

Notes: The table reports the results for the relations among managerial ability, idiosyncratic risk and firm value (proxied by Tobin's Q). The t-statistics in parentheses are computed based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

few of such studies focus on innovative firms. By applying multivariate analyses on China's firms incorporated from 2009 to 2019, this paper investigates how managerial ability affects managerial choices regarding idiosyncratic risk taking. Several important conclusions are obtained. First, strong evidence supports that firms managed by more able managers experience higher idiosyncratic fluctuations than do those managed by less able managers. Second, the relation between managers and idiosyncratic risk varies with the degrees of earnings pressure, information asymmetry and innovation. Third, managerial ability has a positive impact on firm value, yet this positive effect is weakened with higher levels of idiosyncratic fluctuation. In summary, our results shed light on the controversial debates related to the relationship between managers and risk and suggest that more able managers have an advantage in terms of undertaking higher levels of idiosyncratic risk compared to their less able counterparts.

On the whole, our findings bridge the knowledge gap and expand the existing literature in four ways. First, we study the relationship between managerial ability and idiosyncratic risk, which is different from the existing studies of the relation between managerial ability and aggregated risk. The second contribution of this work is understanding that the relation between managers and uncertainty is due to principal-agent conflicts. It is important to understand the underlying factors influencing the relation between manager and risk. The paper is different from that of Wu et al. (2020)³, which focuses on

how managerial ability affects corporate transparency and thus idiosyncratic volatility. Our research directly investigates the impact of managerial ability on idiosyncratic risk, which allows for the exploration of whether able managers use idiosyncratic risk taking as a tool to pursue their own interests rather than to pursue shareholders' value. Third, we contribute to the literature on managerial ability by finding evidence on the factors moderating its effect. Specifically, the relation between managers and idiosyncratic risk varies with earnings pressure, information asymmetry and innovation levels. Finally, we add knowledge to evidence on the dark side of managerial ability (for example, Gul et al., 2018; Mishra, 2014) by showing its negative impact on firm value through higher idiosyncratic risk taking.

Implications

Our results offer several important practical implications for how to constrain the dark side of managerial ability on corporate decision making. First, it is critical to balance revenue growth with risk choice to prevent excessive risk taking by managers under earnings pressure. Second, the discretion provided to able managers may need to be closely monitored to curb managerial rent-seeking incentives. Third, this work highlights the importance of enhancing a firm's information disclosure quality, which not only lowers the likelihood of managerial rent-seeking behaviors but also gives investors the opportunity to clearly access and monitor the risk effect of corporate policy choices.

Limitations and directions for further research

There are some limitations in this study that should be considered in future research. On the one hand, our empirical results are derived from a sample of Chinese firms, and therefore, our findings may be country specific. Further research could use samples from other countries to test and extend this research. On the other hand, there are some potential issues related to the main explanatory variable, managerial ability. One issue has to do with its comprehensiveness: the current measure is constructed mainly based on managers' efficiency in generating revenues, but it does not take into account other dimensions of managerial ability, such as leadership and strategic planning, which are not readily observable. Furthermore, as noted by Demerjian et al. (2012), the managerial ability proxy, while superior to previous alternatives, is not without noise. For example, measurement errors may exist in the accounting variables used to estimate firm and manager efficiency, and since the variable is a residual-based measure, a fraction of it may not be directly attributable to managerial ability.

Despite these caveats, this study employs the best available measure of managerial ability to date and reports results that hold remarkably well to a variety of robustness checks. Overall, the documented association between managerial ability and idiosyncratic risk taking helps extend the existing literature along several dimensions and provides some important insights into the role of managers' innate ability in the formation of corporate policies.

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³ Yung and Chen (2018) discuss the relationship between managerial ability and firm aggregate risk. It is worth noting that of the work of Yung and Chen (2018) is beyond the scope of this paper since we focus on a special type of riskiness, i.e., idiosyncratic risk, but not aggregate risk.

Appendix: Variable Definitions

Idiosyncratic risk variables	
<i>IVOL</i>	Standard deviation of the regression residuals of the Fama-French (1993) three-factor model
Managerial ability	
<i>MA</i>	Firm-level managerial ability score developed by Demerjian et al. (2012)
Measure of earnings pressure	
<i>Gap</i>	Difference between actual earnings and expected earning
Variables of information asymmetry	
<i>Inf</i>	Natural logarithm of one plus the number of financial analysts following the company
Measure of firm innovation	
<i>Innovation</i>	patent volume
Variables in PSM procedures	
<i>HHI</i>	Sales-based Herfindahl index
<i>Size</i>	Natural logarithm of total assets
<i>Lev</i>	Total liabilities divided by total assets
<i>MB</i>	Market-to-book ratio
Other variables	
<i>OL</i>	Ratio of net property, plant, and equipment to total assets growth ratio of sales
<i>Turnover</i>	Annual trading value divided by current market value
<i>Age</i>	Natural logarithm of the sum of the age of the firm plus one
<i>Div</i>	Dummy variable that equals 1 if the firm pays common dividends in the given year and 0 otherwise
<i>PM</i>	Ratio of earnings before interest and taxes divided by sales
<i>Bsize</i>	Natural logarithm of the number of board members
<i>Indep</i>	Proportion of independent board directors
<i>Q</i>	Ratio of the sum of book value of debt and market value of equity in the second quarter of year t+1 to total assets in year t
<i>Growth</i>	Growth ratio of sales
<i>Capital</i>	Ratio of CAPEX to total assets
<i>Segment</i>	Number of business segments
<i>ROA</i>	Return on assets
<i>Fcf</i>	Ratio of operating cash flow less preferred dividend and equity dividend to the book value of assets and intangible assets
<i>R&D</i>	Research and development expenses divided by assets

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