

CAN MANAGERIAL ABILITY INFLUENCE THE FIRM PERFORMANCE DURING THE COVID-19 PANDEMIC?

Yiting Cao

California State University, Los Angeles

Haihong He

California State University, Los Angeles

Lijuan Zhao

California State University, Los Angeles

SUMMARY: This paper investigates whether more able managers can help alleviate the negative effect of the Covid-19 pandemic. We find that high managerial ability has a positive impact on firms' return on assets, profit margin, sales, and operating cash flow during the pre-covid and covid period. We also find that the positive effect of high managerial ability significantly diminishes in the covid period, suggesting that the external interruptions during the pandemic curtailed the benefits of superior managerial ability.

Introduction

The Covid-19 pandemic is probably the most significant global public health crisis in modern history. Its impacts on society, people, and businesses in both the short- and long-term are yet to be determined. Using a sample of US firms in the period from 2019 to 2020, this study investigates whether more able managers are better than less able managers in diverting the business disruption risks rising from this natural disaster and continue to have a better firm performance during the crisis period.

The role of managers on firm performance has been widely studied. Prior studies find that management practices differ across firms and countries (Bloom & Van Reenen, 2007), and the heterogeneity in management practices and managerial ability leads to different business outcomes (Holcomb et al., 2009; Leverty & Grace, 2012; Demerjian et al., 2012). However, it is unclear how managers play a role during the pandemic period, when production and supply are interrupted.

Consistent with previous papers on the managerial ability and firm performance (e.g., Bertrand & Schoar, 2003; Demerjian et al., 2012; Cheung et al., 2017), we document a significantly positive association between Demerjian et al. (2012)' managerial ability measure and firms' performance measures by return on assets (ROA), profit margin (PM), sales scaled by assets (SALE), and operating cash flow (OCF) for the entire sample period consisting of the pre-covid period and the duration of Covid-19. However, we find that this positive association does not increase during this crisis; specifically, more able manager's advantage or better performance in the pre-crisis period diminishes significantly in the covid period.

This study mainly contributes to the research on manager's roles and firm performance and provides valuable insights to the business community. Prior studies of variations in organizational outcomes often focus on either internal firm factors or external environment opportunities/threats (Guerras-Martin et al., 2014). Our study of managerial ability and firm's performance around the Covid-19 pandemic period is a unique setting to look into how internal factors (i.e., managerial ability) and external attributes (i.e., pandemic disruption) *jointly* affect firm performance. The findings in our study shed light on the roles of managerial attributes in firms' operations in an uncertain environment. In addition, our study adds to the extant research of firm performance in a crisis by providing early evidence of whether firms' accounting performance changed from the pre-covid to the covid period.

Literature Review and Hypotheses Development

The Covid-19 pandemic had devastating impacts on the US economy. During the Covid-19 pandemic, people reduced dining, shopping, and entertaining activities to avoid the risks of contracting coronavirus. Consequently, the consumption demand decreased (Jones, 2021). Similarly, operations are interrupted due to increasing unemployment and hence the supply of goods is dramatically reduced (Jones, 2021).

At the firm level, many recent studies investigate the effect of pandemic on firms' performance and what factors will help firms outperform during the Covid-19 pandemic. Using a sample of Chinese companies, Shen et al. (2020) find that Covid-19 has a negative impact on firms' return on equity, and the effect is more pronounced when a firm's investment scale or sales revenue is smaller. Using an international sample, Ding et al. (2021) investigate what characteristics shape firms' immunity to the Covid-19 pandemic. They show that: 1) firms with more exposure to international supply chains and locations will experience more decline in stock prices; and 2) firms with more cash, fewer debts, larger profits, and stronger corporate social responsibility in the pre-covid period or less entrenched executives during the pandemic will have better stock price performance during the pandemic; In addition, Li et al. (2021) find that firms with a strong corporate culture experience better stock market performance than firms with weak corporate culture. Furthermore, some other studies find that firms with high cash holdings, high environmental and social ratings, or flexible work arrangements will perform better and be less affected during the Covid-19 pandemic (Acharya & Steffen, 2020; Albuquerque et al., 2020).

We explore how managerial attributes affect business outcomes during the Covid-19 pandemic period. A growing literature in Economics, Management, and Accounting is inquiring about the role of management practices or managers on business performance from different perspectives. Relying on systematic surveys, Bloom and Van Reenen (2007, 2010) find that management practices are heterogeneous across firms and countries, which contribute to different productivity, profitability, Tobin's Q, sales growth, and survival rates across firms. In a firm-level investigation of the persistence of management styles using archival data, Bertrand and Schoar (2003) show that managers' fixed effects are important in determining a variety of corporate decisions, such as acquisition or diversification decisions, dividend policy, interest coverage, and cost-cutting policy. Leverty and Grace (2012) use the frontier efficiency method to measure managerial ability and find that managerial ability is inversely related to the amount of time a firm spends in distress, the likelihood of a firm's failure, and the cost of failure.

Along a similar line of research of managers' impact on the firm performance, Demerjian

et al. (2012) use the data envelope analysis (DEA) method to create a managerial ability score, which captures managers' ability to efficiently convert firm resources into sales revenue relative to their industry peers. Using this measure, Demerjian et al. (2012) further show that managerial ability is positively associated with stock returns and ROA.

Many recent accounting researchers have since adopted Demerjian et al. (2012) managerial ability measure and have confirmed the positive role of management in firm performance. Some of these papers show a positive association between managerial ability and firms' stock returns and earnings performance (Demerjian et al., 2020; Huang & Sun, 2017; Cheung et al., 2017). Others focus on the specific business strategies and find that more able managers have positive impacts on investment scale (Andreou et al., 2017), employee productivity (Ghosh et al., 2020), innovation outcome (Chen et al., 2015), financing cost-saving (Shang, 2021; Bui et al., 2018; Bonsall et al., 2017), and tax avoidance (Koester et al., 2017). Drawing from evidence in the prior literature, we expect a positive association between managerial ability and firm performance during our test period. This leads to our first hypothesis (stated in alternative form):

H₁: Managerial ability is positively related to firm performance.

A few papers either focusing directly on a crisis setting or conducting supplemental analyses to corroborate the manager's role in the time of a crisis are particularly relevant to our investigation of the manager's role in firm performance during the Covid-19 pandemic period. Using the 2008 global financial crisis as a setting, Andreou et al. (2017) find a strong positive association between pre-crisis managerial ability and crisis-period capital expenditure. This result suggests that managers' ability facilitated greater access to financing resources. In the additional analyses, Bonsall et al. (2017) show that managerial ability plays a larger role in determining credit ratings in higher-risk settings proxied by daily return volatility. Using the variation of sales to capture environment uncertainty, Ghosh et al. (2020) show that managerial ability moderates the negative effect of an uncertain environment on employee productivity. In sum, the findings in the prior literature suggest that managerial ability can strategically help firms in dealing with investing, financing, and operating difficulties in an uncertain environment.

The recent studies on the Covid-19 pandemic suggest that good managerial ability may help firms respond better to the crisis and result in less unfavorable firm outcomes caused by Covid-19. Ding et al. (2021) show that firms with less entrenched executives performed better during the Covid-19 pandemic. Kumar and Zbib (2022) find that firms with high managerial ability experienced better stock prices, higher raw and cumulative abnormal returns, and higher return on equity during the Covid-19 crisis period. However, Kumar and Zbib (2022) only examine the firm performance in the first quarter of Covid-19, without a comparison of pre-covid and covid periods. We investigate whether the association between managerial ability and firm performance *changed* from the pre-covid to the covid period.

Based on the prior academic findings that managerial ability helps firms in dealing threats from the external environment, we expect a more positive association between managerial ability and firm performance during the pandemic. Thus, we propose the second hypothesis (stated in alternative form):

H₂: The positive effect of managerial ability on firm performance is more pronounced during the pandemic.

We may fail to find support for *H₂* for a few reasons. First, the hardships created by the Covid-19 pandemic are disruptions (Jones, 2021) rather than systematic failures or malfunctions in financial or economic systems, and this public health crisis is indisputably different from the prior crises such as the 2008 Great Recession. Second, the firm performance during the pandemic is found to be associated with certain firm characteristics such as corporate culture (Li et al., 2021), flexible work arrangements (Papanikolaou & Schmidt, 2020), and such firm attributes are arguably not associated with or affected by the managerial ability which is defined and measured following Demerjian et al. (2012) in this paper.

Research Design

We examine *H₁* and *H₂* by estimating the following model:

$$FP_{i,t} = \alpha_0 + \alpha_1 MA_{i,t} + \alpha_2 COVID_{i,t} + \alpha_3 SIZE_{i,t-1} + \alpha_4 MTB_{i,t-1} + \alpha_5 LEV_{i,t-1} + \alpha_6 GROWTH_{i,t-1} + \alpha_7 OCF_{i,t-1} + \alpha_8 IndFE + \alpha_9 QuarterFE + \epsilon_{i,t} \tag{1}$$

In this model, *Firm Performance* is measured by four quarterly accounting proxies: return on assets (*ROA*), profit margin (*PM*), assets scaled sales (*SALE*) and operating cash flow (*OCF*). *COVID* is the Covid-19 pandemic period indicator variable, which equals 0 for the quarters from January 2019 to March 2020, and 1 for the quarters from April 2020 to the end of 2020. We use the managerial ability ranking proxy constructed by Demerjian et al. (2012) to capture the managers’ attributes. The managerial ability ranking proxy is the decile ranks (by industry and year) of Demerjian et al. (2012) managerial ability score, which is calculated as the firm efficiency in turning resources into earnings that cannot be explained by the firm characteristics in generating revenues. This measure is available until 2018. Thus, we use the managerial ability rank in 2018 to capture the firm-level managerial ability in our test period. *High_MA* is an indicator variable equal to 1 for the sample firms with managerial ability rank in 2018 (*MA*) above the sample median and 0 otherwise. We control for size (*SIZE_{t-1}*), growth opportunity (*MTB_{t-1}*), leverage level (*LEV_{t-1}*), past sales growth rate (*GROWTH_{t-1}*), and past operating cash flow (*OCF_{t-1}*). All variables are defined in Appendix A. Industry and quarter fixed effects (*Ind FE* and *Quarter FE*) are included to control for the industry differences and the macroeconomic changes during our sample period. α_1 captures the effect of *High_MA* on firm accounting performance (*ROA*, *PM*, *SALE*, and *OCF*). Based on the prior literature (Demerjian et al. 2012, Cheung et al. 2017), we expect that *High_MA* and *Firm Performance* are positively associated (*H₁*). We use α_2 to examine whether managerial ability affects firm performance differently in the pandemic period (i.e. *COVID*=1). If *H₂* is true, we expect α_2 to be positive and significant.

Sample Selection and Descriptive Statistics

Table 1 presents the sample selection process. We start from the US firms in Compustat quarterly database over 2019 – 2020, and then exclude the firms in the financial and utility industries (i.e., SIC= 6000-6999 or 4000-4999). Since our key variable of interest – the managerial ability index – is constructed by Demerjian et al. (2012) and is only available until 2018, we use the 2018 managerial ability (MA) ranking as the proxy for firms’ managerial ability over 2019 – 2020. Thus, we limit our sample to the firms with Execucomp CEO data and have no CEO turnover during 2018 – 2020. Finally, we exclude firms without the necessary regression variables. Our final sample includes 6,543 quarterly observations (896 firms).

Table 1. Sample Selection Process

	Remaining Firms	Remaining Firm-quarters
US firm-quarters (2019–2020) available on COMPUSTAT	12,365	90,554
Delete observations: in financial and utility industries with SIC 6000-6999 or 4000-4999	(6,147)	(44,222)
	6,218	46,332
missing Execucomp data	(5,000)	(37,053)
	1,218	9,279
have CEO turnovers during 2018 – 2020	(306)	(2,290)
	912	6,989
missing managerial ability index or other necessary regression variables	(16)	(346)
Final Sample	896	6,643

Table 2 presents descriptive statistics and a correlation table. In general, we find that *COVID* is negatively associated with *PM* and *SALE*. These results suggest a decrease in the accounting performance during the pandemic. In addition, we also find that *MA* is positively associated with performance measures *ROA*, *PM*, *SALE*, and *OCF*.

Table 2. Descriptive Statistics and Correlation Table

Panel A. Descriptive Statistics						
	<i>ROA</i>	<i>PM</i>	<i>SALE</i>	<i>OCF</i>	<i>MA</i>	<i>COVID</i>
N	6643	6643	6643	6643	6643	6643
mean	0.008	-0.002	0.226	0.025	0.547	0.356
sd	0.031	0.349	0.143	0.032	0.295	0.479
p25	0.000	-0.002	0.130	0.009	0.300	0.000
p50	0.011	0.050	0.190	0.025	0.500	0.000
p75	0.022	0.109	0.285	0.042	0.800	1.000

Panel B. Correlation Table						
	<i>ROA</i>	<i>PM</i>	<i>SALE</i>	<i>OCF</i>	<i>MA</i>	<i>COVID</i>
<i>ROA</i>	1					
<i>PM</i>	0.7648*	1				
<i>SALE</i>	0.2104*	0.1609*	1			
<i>OCF</i>	0.4516*	0.3159*	0.1863*	1		
<i>MA</i>	0.1370*	0.0492*	0.2481*	0.1316*	1	
<i>COVID</i>	-0.0237	-0.0452*	-0.0787*	0.1054*	0.0042	1

All variables are defined in Appendix A. * represents significance at the 5% level (based on two-tailed tests).

Empirical Results

Table 3 presents OLS regression results from estimating Equation (1). The results suggest a negative association between the pandemic period (i.e., *COVID*=1) and firm's return-on-assets ratio (*ROA*), profit-margin ratio (*PM*), and sales (*SALE*). Consistent with the prior literature (Demerjian et al., 2012; Cheung et al., 2017), we find β_j generally positive and significant in all the columns, suggesting a positive association between *High_MA* and firm performance measures. This finding is consistent with our expectation in H_1 . However, β_0 is generally negative and significant in all four columns, suggesting a decrease in the positive association between *High_MA* and firm performance during the covid period. These results indicate that the positive effect of managerial ability is reduced during the Covid-19 pandemic period, which does not support our expectation in H_2 . Note that $\beta_1 + \beta_2$ is still positive and significant when the dependent variable is *SALE* and *OCF*, suggesting a positive effect of managerial ability on *SALE* and *OCF* during the covid-period. In sum, our results suggest that managerial ability to efficiently utilize resources to generate revenues are significantly restricted during the Covid-19 pandemic. One possible

explanation is that more able managers' advantage diminishes when they have limited human and material resources and when the operations are interrupted by a policy-driven shock.

Table 3. Effect of Managerial Ability on Firm Performance – Examination of H1 and H2

		(1) <i>ROA_t</i>	(2) <i>PM_t</i>	(3) <i>SALE_t</i>	(4) <i>OCF_t</i>
<i>COVID</i>	!#	-0.016*** -3.14	-0.095** -2.16	-0.040*** -2.76	-0.005 -1.07
<i>High_MA</i>	!1	0.005*** 5.44	0.022** 2.28	0.066*** 20.21	0.006*** 6.38
<i>COVID × High_MA</i>	!..	-0.004*** -2.89	-0.045*** -2.70	-0.010* -1.91	-0.004*** -2.66
<i>!1 + !..</i>		0.001 0.83	-0.023 -1.59	0.056*** 13.53	0.002* 1.90
<i>SIZE_{t-1}</i>	!\$	0.002*** 7.65	0.031*** 9.81	-0.025*** -23.55	0.001*** 2.62
<i>MTB_{t-1}</i>	!%	0.001*** 11.12	0.003*** 5.22	0.001*** 4.05	0.001*** 7.38
<i>LEV_{t-1}</i>	!&	-0.012*** -5.49	-0.046* -1.67	-0.003 -0.34	-0.003 -1.39
<i>GROWTH_{t-1}</i>	!.	0.002 1.04	-0.070* -1.87	0.011 1.62	0.010*** 4.04
<i>OCF_{t-1}</i>	!C	0.259*** 16.92	2.494*** 11.61	0.308*** 6.04	0.163*** 8.71
<i>Intercept</i>		0.002 0.37	-0.299*** -8.59	0.681*** 40.78	0.036*** 5.72
Quarterly Fixed Effects		Yes	Yes	Yes	Yes
Industry Fixed Effects		Yes	Yes	Yes	Yes
N		6643	6643	6643	6643
adj. R-sq		0.245	0.182	0.549	0.151

All variables are defined in Appendix A. t-statistics are presented below coefficients; standard errors are clustered to account for heteroskedasticity. ***, **, * represent significance at the 0.01, 0.05 and 0.10 level, based on the two-tailed tests of significance.

In order to examine the robustness of our primary test results in Table 3, we re-estimate the regression analyses in these two tables with alternative control variables and an alternative measure of managerial ability. First, we re-estimate the regression with additional control variables of managers' characteristics: CEO tenure, CEO cash compensation, and CEO equity holding. Second,

we alternatively measure the managerial ability (*MA*) using the salary payment different than predicted by economic determinants (referred to as “excess pay”) following Carter et al. (2010). The results remain qualitatively similar to those in Table 3 with these two additional analyses (untabulated).

Conclusion

We investigate whether more able managers can help alleviate the negative effect of the Covid-19 pandemic. Our results suggest that the Covid-19 pandemic generally has a negative effect on firms’ return on assets, profit margin, and sales scaled by assets, and that high managerial ability has a generally positive impact on these accounting performances during the pre-covid and covid period. However, we find such positive effect significantly diminishes in the covid period. These results suggest that the external interruptions during the Covid-19 pandemic curtailed the benefits of superior managerial ability. The results in this paper are of interest to the investors and managers since they reveal a restriction of external business and economic threats on the advantages of good management.

Corresponding author: Dr. Yiting Cao, ycao@calstatela.edu

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Appendix A. Variable Definitions

Dependent Variables:

<i>ROA</i>	Return on assets ratio, calculated as quarterly income before extraordinary items scaled by the beginning-of-quarter total assets.
<i>PM</i>	Profit margin ratio, calculated as quarterly income before extraordinary items scaled by the quarterly sales.
<i>SALE</i>	Quarterly sales scaled by quarterly average assets.
<i>OCF</i>	Quarterly operating cash flow scaled by quarterly average assets.

Variables of Interest:

<i>COVID</i>	COVID is an indicator variable that equals 1 for the quarters from April 2020 to the end of 2020, and 0 for quarters from January 2019 to March 2020.
<i>MA</i>	Demerjian et al. (2012)'s Managerial Ability deciles rank proxy in 2018. The data was downloaded from the Demerjian's website: https://peterdemerjian.weebly.com/managerialability.html .

Independent Variables:

<i>SIZE_{t-1}</i>	The natural logarithm of total assets at the beginning of the quarter.
<i>MTB_{t-1}</i>	Beginning of quarter market value of equity divided by the book value of equity.
<i>Lev_{t-1}</i>	Beginning of quarter book leverage ratio, defined as total liabilities divided by total assets.
<i>GROWTH_{t-1}</i>	Prior quarter's sales growth rate, calculated as the sales changes scaled by the prior quarter's sales.
<i>OCF_{t-1}</i>	Prior quarter's operating cash flow scaled by average total assets.
