

Bryant University

Bryant Digital Repository

Finance Journal Articles

Finance and Financial Services Faculty
Publications and Research

2-10-2022

Firm Performance During the Covid-19 Crisis: Does Managerial Ability Matter?

Sonal Kumar

Leila Zbib

Follow this and additional works at: <https://digitalcommons.bryant.edu/finjou>



Part of the **Finance Commons**

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Firm performance during the Covid-19 crisis: Does managerial ability matter?

Sonal Kumar, Leila Zbib*

Bryant University, Department of Finance, United States

ARTICLE INFO

JEL Codes:

G01
G14
G32
J24

Keywords:

CEO Managerial Ability
Covid-19
Firm Performance
Firm Liquidity

ABSTRACT

Challenged by the Covid-19 crisis, CEOs must rethink about how to operate and exist in the new working environment. We examine if managerial ability of the CEO impacts firm performance during the crisis period. We find a positive and significant association between the CEO managerial ability and both the cumulative raw and abnormal returns. We also find that firms with better CEO managerial ability are more resilient and have higher ROE than their counterparts. We find that the CEOs with higher managerial ability have higher pre-pandemic liquidity which in part explains the better performance amid the Covid-19 crisis.

1. Introduction

In early 2020, the COVID-19 pandemic shook the global economy. The S&P 500 took a major hit and fell by 33% at the start of the pandemic. The market reaction to the pandemic is considered unprecedented even compared to previous major outbreaks such as the Great Depression and the Spanish Flu (Baker et al., 2020). CEOs had to quickly transition from the traditional firm objectives (market share; revenue growth) to the sole objective of firm survival. The managerial ability of the CEOs became crucial during the crisis as leaders needed to make quick decisions due to the increasing economic uncertainty. CEOs had to adapt to the new environment of remote working, online revenue streams, and other ways to procure production processes. Thus, firms whose CEO's possess a higher managerial ability and steeper learning are likely to outperform their less qualified counterparts. In fact, numerous researchers document the impact of the CEO's managerial ability on various components of the firm such as firm performance (Chemmanur et al., 2009; Demerjian et al., 2012), earnings quality (Demerjian et al., 2013; Baik et al., 2011), and innovation (Chen et al., 2015). However, whether managerial ability of the CEO is valuable during a crisis period is still not clear.

In this paper, we examine if CEO managerial ability influences firms' performance during the Covid-19 crisis. Using quarterly firm level accounting data from Compustat, daily stock return data from CRSP, and the managerial ability score proxied by Demerjian et al. (2012), we find heterogeneity in both the firm's stock returns and the accounting performance because of the CEOs' managerial capabilities. First, we find that managerial ability is positively and significantly associated with both cumulative raw and abnormal returns during the pandemic crisis period. Second, we find firms headed by CEOs with high managerial ability are more resilient and have a higher return on equity (ROE) for the first quarter of 2020. Third, we find CEOs with higher managerial ability have significantly higher surplus cash which in part explains the better performance amid the Covid-19 crisis.

* Corresponding author: Finance, Bryant University, 1150 Douglas Pike, Suite J, Smithfield, RI 02917, United States.
E-mail address: lzbib@bryant.edu (L. Zbib).

<https://doi.org/10.1016/j.frl.2022.102720>

Received 17 November 2021; Received in revised form 11 December 2021; Accepted 7 February 2022

Available online 10 February 2022

1544-6123/© 2022 Elsevier Inc. All rights reserved.

We attempt to contribute to two distinct areas of literature. We first contribute to the existing literature on the impact of managerial ability on various corporate outcomes. For example, [Bonsall \(2017\)](#) finds lower variability in future earnings and stock returns for firms run by CEOs with high managerial ability. Similarly, [Chen and Lin \(2018\)](#) find that firms whose CEOs have high managerial ability generate better long term buy-and-hold returns of the acquiring firms. More recently, [Neukirchen et al. \(2021\)](#) find that firm efficiency has a positive effect on stock returns during the Covid-19 pandemic. Our analysis expands on this literature by providing evidence of the importance of CEO's managerial ability during an economic crisis.

Second, we contribute to the literature that examines the effects of the Covid-19 crisis on the stock market. While most studies provide an understanding of the impact of Covid-19 on stock returns and volatility ([Phan and Narayan, 2020](#); [Ramelli and Wagner, 2020](#)), liquidity and riskiness ([Just and Echaust, 2020](#); [Rizwan et al., 2020](#)), they do not offer much evidence on whether any qualitative characteristics of corporate managers lead some firms to be more resilient and perform better during periods of stress. Using the Covid-19 pandemic as an exogenous shock to the economy, we uncover how differences in the managerial ability of CEOs can impact firm performance.

2. Data

This paper utilizes financial data from 738 US firms in the Compustat database and their associated stock return information from CRSP. We exclude companies from the financial and utilities industries and companies with price per share of less than \$5. We use the managerial ability score¹ index constructed by [Demerjian et al. \(2012\)](#) to capture the portion of firm efficiency attributed to the firm's manager. Thus, it is an indication of the manager's "talent" and measures the manager's efficiency in generating revenues. To study the relationship between managerial ability and firm performance during the Covid crisis, we follow [Neukirchen et al., 2021](#) by examining the crisis period from February 3, 2021, to March 23, 2021. We measure stock performance using cumulative raw returns and cumulative abnormal returns for the crisis period. Cumulative abnormal returns (CAR) are the sum of daily abnormal returns for the crisis period. Each day's abnormal return is calculated as daily return minus the expected return. The estimated return is calculated using the market model, with the estimation period from 255 days to 3 days prior to the start of the crisis period. To proxy for market returns, we use CRSP value weighted index. Similarly, cumulative raw returns are the sum of daily stock returns during the crisis period. We measure accounting performance using return on assets (ROA) and return on equity (ROE) for the first quarter of 2020. We control for industry fixed effects in all our regression models.

[Table 1](#) presents the descriptive statistics of the sample. Panel A contains summary statistics for all variables used in the regression models. The average cumulative raw returns and market adjusted abnormal returns are -46.1% and -2% respectively. The negative average return is consistent with [Bae et al. \(2021\)](#), suggesting that the stock market negatively reacted to the news of the pandemic during this period. Panel A also shows average ROA and ROE to be negative for the first quarter of 2020. The mean value of our managerial ability score is 0.021. Panel B of [Table 1](#) shows the frequency distribution of firms by industry. We use Fama French 12 industry classifications. We find firms in consumer durables and wholesale, retail, and service industries to have experienced more negative stock returns relative to other industries.

3. Empirical analysis and results

3.1. Univariate results

We classify the sample firms based on the median managerial ability score of all firms. High managerial ability is an indicator variable that takes the value of 1 if the firm has a CEO managerial ability above the sample median, and 0 otherwise. [Table 2](#) presents the corresponding univariate analysis based on this bifurcation. We find that the differences in cumulative raw returns and market adjusted abnormal returns are positive and significant at 10% and 5% level, respectively. It suggests that firms with high managerial ability experience higher returns than those with low managerial ability. We also find significant differences in both ROA and ROE based on managerial ability. The mean difference in ROA between groups of firms with high and low managerial ability is 0.4%, significant at 10% level. In addition, we find that firms with high managerial ability have significantly higher size, higher surplus cash, and lower financial constraints. CEOs of firms with high managerial ability are also found to have a longer tenure and higher equity holdings relative to the firms with lower managerial ability.

3.2. Regression results

Since the univariate results do not control for firm-specific factors, we run a regression analysis to examine the impact of managerial ability on firm performance. We control for several firm characteristics and industry fixed effects. Panel A of [Table 3](#) shows the corresponding regression results. In model (1) and (2), we find that managerial ability has a positive impact on cumulative raw returns and CAR, significant at 1% level. The results indicate that firms with high managerial ability witnessed a lower fall in stock prices during the crisis period. Models (3) and (4) test the impact of managerial ability on ROA and ROE. We still find that firms with high managerial ability performed better in the first quarter of 2020. The coefficient of managerial ability is positive and significant at 10%

¹ Data on the managerial ability index is available from [Demerjian et al. \(2012\)](#) until 2018. We use the 2018 data as measure of managerial ability in 2020. We limit our sample to firms with no CEO turnover between 2018 and 2020.

Table 1
Descriptive statistics.

Panel A: Descriptive statistics					
	No of Obs.	Mean	Std Dev	Min	Max
Cumulative Raw Returns	738	-0.461	0.317	-1.851	0.663
Cumulative Abnormal Returns	738	-0.02	0.28	-1.004	1.12
ROA	738	-0.003	0.05	-0.064	0.095
ROE	738	-0.058	1.22	-1.036	5.675
Managerial Ability	738	0.014	0.179	-0.252	0.679
Firm Size	738	8.133	1.61	3.342	13.614
Book Leverage	735	0.332	0.232	0	3.147
Market to Book Ratio	735	4.224	4.433	-1.488	3.489
Surplus Cash/Total Assets	470	0.106	0.103	-0.294	0.608
Z-Score	371	1.696	0.35	-2.268	5.564
CEO Tenure	698	1.831	0.925	-5.899	4.05
CEO Cash Compensation	732	6.623	1.619	-6.907	9.282
CEO Equity Holdings	719	-0.597	1.731	-6.907	4.139
Panel B: Industry analysis					
Industry	No of Firms	Cumulative Raw Returns	Cumulative Abnormal Returns	ROA	ROE
Consumer Non-Durables	45	-0.472	-0.112	-0.017	-0.055
Consumer Durables	26	-0.605	-0.075	-0.057	-0.09
Manufacturing	112	-0.488	-0.037	0.042	0.022
Oil, Gas and Coal Extraction and Products	53	-0.801	-0.179	-0.06	-0.076
Chemicals and Allied Products	37	-0.464	0.001	0.044	0.023
Business Equipment	145	-0.335	0.103	0.056	0.014
Telephone and Television Transmission	23	-0.242	0.091	0.033	-0.091
Wholesale, Retail and, some Services	83	-0.525	-0.087	-0.074	-0.063
Healthcare, Medical Equipment, and Drugs	90	-0.298	0.1	0.015	-0.047
Other	123	-0.513	-0.102	0.015	0.078

Panel A reports the descriptive statistics for our sample consisting of 738 US firms. Stock and accounting data is obtained from Compustat and CRSP. All variables are defined in Appendix 1. Panel B reports the frequency distribution and firm performance for Fama-French 12 industries (except financial and utilities industries). The cumulative raw returns and cumulative raw returns are estimated for the crisis period (February 3 – March 23, 2021). We use ROA and ROE of firms for first quarter of 2020 to measure the accounting firm performance.

Table 2
Univariate analysis.

Variables	High Managerial Ability	Low Managerial Ability	Difference
Cumulative Raw Returns	-0.472	-0.508	0.035*
Cumulative Abnormal Returns	-0.021	-0.067	0.045**
ROA	-0.044	-0.050	0.004*
ROE	-0.198	-0.267	0.069*
Firm Size	9.044	7.772	1.272***
Book Leverage	0.315	0.344	-0.029
Market to Book Ratio	7.745	4.202	3.543
Surplus Cash/Total Assets	0.149	0.066	0.083***
=Z-Score	1.356	2.005	-0.649*
CEO Tenure	1.917	1.701	0.216**
CEO Cash Compensation	6.704	6.555	0.185
CEO Equity Holdings	1.037	0.420	0.617***

This table presents the univariate analysis of firm performance variables for high and low managerial ability scores. We calculate cumulative raw returns and cumulative abnormal returns as the sum of raw returns and abnormal returns for the crisis period (February 3, 2020, to March 23, 2020). Accounting performance is measured using return on assets (ROA) and return on equity (ROE) for the first quarter of 2020. The control variables are defined in Appendix 1. We calculate the difference in variables for firms with high managerial ability and low managerial ability. The symbol ***, **, * indicate statistical significance at 1%, 5% and 10% level respectively.

level, suggesting that higher managerial ability leads to higher ROA. The regression results also show some significant control variables. The coefficient of book leverage is negative and significant in models (1) and (2), because higher leverage can increase firm risk. The coefficient of Z-score is negative and significant in models (3) and (4) as higher Z-score signifies financial constraints and lower ROA.

Panel B of Table 3 shows the results based on high and low managerial ability classification. We find that firms with high managerial ability depict higher firm performance. The coefficient of managerial ability is positive and significant at 1% level in models (1) and (2). This indicates that firms with high managerial ability witnessed a lower fall in stock returns during Covid-19. Similarly, in models (3) and (4), the results indicate a positive and significant impact of managerial ability on ROA and ROE for the first quarter of 2020. This indicates that managerial ability is crucial as it impacts firm performance during the crisis period.

Table 3
Impact of managerial ability on stock returns and firm performance.

Panel A: Impact of managerial ability on stock returns and firm performance during Covid				
Variables	Cumulative Raw Returns	Cumulative Abnormal Returns	ROA	ROE
	-1	-2	-3	-4
Managerial Ability	0.219***	0.312***	0.031*	0.253*
	-2.44	-3.7	-1.68	-1.73
Firm Size	0.013	0.007	0.002	-0.009
	-1.27	-0.74	-1.05	-0.59
Book Leverage	-0.422***	-0.234***	-0.015	-0.027
	-4.99	-2.95	-0.88	-0.2
Market to Book Ratio	-0.003**	-0.001	0.002	0.013***
	-2.06	-0.86	-0.87	-5.52
Surplus Cash/Total Assets	0.217*	-0.039	0.118***	-0.124
	-1.74	-0.27	-3.65	-0.49
Z-Score	0.001	0	-0.004***	-0.004***
	-1.02	-0.04	-3.32	-2.87
Constant	-0.402***	0.045	-0.032*	-0.016
	-4.98	-0.6	-1.93	-0.12
FF12 Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	738	738	738	738
Adjusted R-Squared	0.141	0.084	0.071	0.096
Panel B: Comparison of the effects of high (top quartile) and low (bottom quartile) managerial ability on firm performance				
Variables	Cumulative Raw Returns	Cumulative Abnormal Returns	ROA	ROE
	-1	-2	-3	-4
High Managerial Ability	0.552***	0.717***	0.085**	0.463**
	-2.87	-4.24	-2.26	-2.2
Low Managerial Ability	-0.532	-0.59	-0.007	0.803
	-0.52	-0.68	-0.03	-0.56
Control Variables	Yes	Yes	Yes	Yes
FF12 Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	186	186	186	186
Adjusted R-Squared	0.093	0.248	0.121	0.259

This table shows the results from OLS regression. In Panel A, we employ a firm's cumulative raw returns and cumulative abnormal stock returns for the period from February 3, 2020, to March 23, 2020, as the two dependent variables. We also use the ROA and ROE for the first quarter of 2020 to measure accounting performance. The main independent variable of interest is managerial ability. Managerial ability is CEO's managerial ability score using DEA analysis. We control for industry fixed effects. In Panel B, we classify managerial ability in high and low managerial ability based on the median managerial ability across firms. The regression specifications are similar to Panel A. ***, **, *, denote statistical significance at 1%, 5% and 10% level.

4. Additional analysis

4.1. Controlling for additional factors

In Table 4 we control for various other CEO characteristics such as tenure, compensation and equity holdings that might be impacting firm performance and are closely correlated with managerial ability. For example, Manso (2011) finds that CEO salary impacts firm performance. As remuneration contracts might impact managerial ability, it is important to control for CEO characteristics. After controlling for CEO characteristics, we consistently find a positive relationship between managerial ability and firm performance variables.²

4.2. Managerial ability, firm liquidity, and firm performance

To better understand the role of managerial ability in improving firm performance, we next explore the decisions undertaken by managers with high managerial ability. More specifically, we examine whether surplus cash held by firms affects the relationship between managerial ability and firm performance. Pinkowitz and Williamson (2004) suggests that the value of cash depends on how the CEOs manage it. The Covid crisis increased uncertainty leading to higher stock volatility and riskiness. In this section, we examine if managers with high ability have higher levels of free cash flow which led to better firm performance during the crisis period. We use three measures of free cash flows: Cash/Total Assets, Surplus Cash/Total Assets and Working Capital/Total Assets to examine the relationship between managerial ability and firm liquidity.

Table 5 presents the results. Panel A of Table 5 shows the baseline regression depicting the relationship between managerial ability and firm liquidity. We find a positive relation between managerial ability and firm liquidity. The coefficient of managerial ability is positive and significant for all three measures of firm liquidity. Consistent with Tsai et al. (2021), we find that managers with high

² We find similar results when we use high and low managerial ability classification.

Table 4
Impact of managerial ability on stock returns and firm performance during Covid – Controlling for CEO related variables.

Variables	Cumulative Raw Returns	Cumulative Abnormal Returns	ROA	ROE
	(1)	(2)	(3)	(4)
Managerial Ability	0.235*** (2.45)	0.330*** (3.53)	0.021 (1.15)	0.148* (1.73)
Firm Size	0.010 (0.78)	0.012 (0.99)	0.001 (0.79)	0.013 (0.75)
Book Leverage	-0.418*** (4.50)	-0.235*** (2.76)	-0.014 (0.86)	-0.081 (0.65)
Market to Book Ratio	-0.003* (1.83)	-0.009 (0.55)	0.007 (1.57)	0.006*** (2.54)
Surplus Cash/Total Assets	0.311* (1.80)	0.025 (0.16)	0.120*** (3.71)	0.044** (2.19)
Z-Score	0.002 (0.92)	0.001 (0.10)	-0.004*** (3.19)	-0.005*** (3.04)
CEO Tenure	-0.020 (1.13)	-0.008 (0.54)	0.002 (0.74)	0.048* (2.00)
CEO Cash Compensation	-0.009 (0.12)	0.005 (0.08)	0.009*** (3.17)	0.037*** (3.46)
CEO Equity Holdings	-0.003 (0.25)	0.010 (0.91)	0.006 (0.28)	0.023 (1.40)
Constant	-0.344*** (2.91)	0.024 (0.22)	-0.098*** (4.42)	-0.313* (1.95)
FF12 Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	623	623	623	623
Adjusted R-Squared	0.132	0.079	0.212	0.110

This table shows the results from OLS regression. We employ a firm's cumulative raw returns and cumulative abnormal stock returns for the period from February 3, 2020, to March 23, 2020, as the two dependent variables. We also use the ROA and ROE for the first quarter of 2020 to measure accounting performance. The main independent variable of interest is managerial ability. Managerial ability is CEO's managerial ability score using DEA analysis. In addition to the control variables using in previous model, we control for CEO tenure, CEO cash compensation and CEO equity held. ***, **, *, denote statistical significance at 1%, 5% and 10% level.

managerial ability can manage cash more efficiently than their counterparts with low managerial ability. In the pandemic crisis, firm liquidity is an important factor to manage uncertainty and riskiness. A higher level of cash surplus and working capital is an important factor to manage a firm more efficiently. This lead firms with higher managerial ability to experience a lower decrease in stock returns and better firm performance.

In Panel B of Table 5, we divide the sample between high and low managerial ability. Consistent with the previous results, we find that firms with high managerial ability have higher cash reserves. We find the coefficient of high managerial ability to be positive and significant at 1% level. The coefficient of low managerial ability is positive and insignificant suggesting that managers with high managerial ability are better able to manage the firm during the crisis period by having a higher cash reserve. Overall, the results indicate that firms with high managerial ability are more resilient and perform better during the crisis period because they have a higher liquidity and more cash reserves.

5. Conclusion

We investigate whether firms led by CEOs with higher managerial ability witnessed better stock price reaction during the market collapse at the beginning of the Covid-19 pandemic compared to their counterparts. We find that firms led by CEOs with high managerial ability witnessed higher raw and cumulative abnormal returns during the Covid-19 pandemic compared to CEOs with low managerial ability. We also find that these firms witnessed higher return on equity than their counterparts during the pandemic. As many firms experienced more financial constraints during the pandemic because access to the market was limited, other firms were more self-sufficient and were not as financially constrained. We find that one explanation for the better performance witnessed by firms with higher managerial ability CEOs is the financial flexibility that these firms have, compared to their counterparts.

Author statement

Sonal Kumar, Methodology, Software, Validation, Writing
Leila Zbib, Conceptualization, Methodology, Writing

Appendix A. Variable Definition

(continued on next page)

Table 5
Impact of managerial ability on firm liquidity.

Panel A: Regressions depicting the impact of managerial ability on firm liquidity			
Variables	Cash/Total Assets	Surplus Cash/Total Assets	Working Capital/Total Assets
	-1	-2	-3
Managerial Ability	0.299***	0.156***	0.364**
	-10.65	-8.99	-10.98
Firm Size	-0.033***	-0.016***	-0.049***
	-4.33	-5.75	-4.02
Book Leverage	-0.036*	-0.054***	-0.095***
	-1.67	-3.52	-3.71
Market to Book Ratio	0.004	-0.003**	-0.001
	-0.36	-2.12	-1.31
ROA	-0.212***	0.008***	-0.380***
	-3.01	-3.95	-4.57
Z-Score	-0.009***	-0.008***	-0.023***
	-3.06	-4.72	-6.12
Constant	0.410***	0.137***	0.667*
	-15.86	-8.83	-1.83
FF12 Industry Fixed Effect	Yes	Yes	Yes
Observations	716	657	716
Adjusted R-Squared	0.252	0.559	0.35
Panel B: Comparison of the effects of high (top quartile) and low (bottom quartile) managerial ability on firm liquidity			
Variables	Cash/Total Assets	Surplus Cash/Total assets	Working Capital/Total Assets
	-1	-2	-3
High Managerial Ability	0.471***	0.160***	0.421***
	-7.61	-2.94	-5
Low Managerial Ability	0.271	0.113	0.584
	-1.46	-1.01	-1.83
Control Variables	Yes	Yes	Yes
FF12 Industry Fixed Effect	Yes	Yes	Yes
Observations	183	186	183
Adjusted R-Squared	0.336	0.46	0.445

This Table shows the OLS regression results of managerial ability on firm liquidity. In Panel A, we use the ratio of Cash to total assets, surplus cash to total assets and working capital to total assets as measures of firm liquidity. The main independent variable of interest is managerial ability. In panel B, we classify managerial ability in high and low managerial ability based on the median managerial ability across firms. The regression specifications are similar to Panel A. ***, **, *, denote statistical significance at 1%, 5% and 10%.

(continued)

Variables	Description
Cumulative Raw Returns	The cumulative daily returns of the stocks for the crisis period
Cumulative Abnormal Returns	The cumulative daily abnormal return calculated as the raw return minus the expected return, which is estimated based on a market model over a year ranging from January 2019 to January 2020
ROA	Return on assets for the quarter ending June 2020. It is calculated as income before extraordinary items/total assets
ROE	Return on equity for the quarter ending June 2020. It is calculated as income before extraordinary items/total shareholders' equity
Managerial Ability	Managerial ability score (Demerjian et al., 2012, 2013)
Firm Size	Natural Logarithm of Book Assets
Book Leverage	(Short term debt + Long term debt)/Total Assets
Market to Book Ratio	Ratio of market value of assets to book value (csho*prcc_f)/ceq
Cash/Total Assets	Calculated as (Cash and Short-term investments)/Total Assets
Surplus Cash/Total Assets	Calculated as (Operating activities net cash flow - Depreciation and Amortization + R&D expense)/Total Assets
Working Capital/ Total Assets	Calculated as the ratio of working capital to total assets.
Z-Score	$1.2 * (\text{Total current assets} - \text{total current liabilities}) + 1.4 * \text{Retained earnings} + 3.3 * (\text{Net income} + \text{total interest and related expense} + \text{Total income taxes} + \text{Sale}) / \text{Total Assets} + 0.6 * (\text{Fiscal annual closed price} * \text{common share outstanding}) / \text{Total Assets}$
CEO Tenure	Natural log of CEO tenure
CEO Cash Compensation	Natural log of CEO's current cash compensation (Salary + Bonus)
CEO Equity Holdings	Natural log of CEO's equity holdings: CEO stock value + option value.

References

- Bae, K.-H., El Ghoul, S., Gong, Z., Guedhami, O., 2021. Does CSR matter in times of crisis? Evidence from the Covid-19 pandemic. *J. Corp. Finance* 67, 101876.
- Baik, B.O.K., Farber, D.B., Lee, S.A.M., 2011. CEO ability and management earnings forecasts. *Contemp. Account. Res.* 28 (5), 1645–1668.
- Baker, S.R., Bloom, N., Davis, S.J., Kost, K., Sammon, M., Viratyosin, T., 2020. The Unprecedented Stock Market Reaction to COVID-19. *Rev. Asset. Pric. Stud.* 10 (4), 742–758.

- Bonsall, I.V., S. B., Holzman, E.R., Miller, B.P., 2017. Managerial ability and credit risk assessment. *Manage. Sci.* 63 (5), 1425–1449.
- Chemmanur, T.J., Paeglis, I., Simonyan, K., 2009. Management quality, financial and investment policies, and asymmetric information. *J. Financ. Quant. Anal.* 44 (5), 1045–1079.
- Chen, S.S., Lin, C.Y., 2018. Managerial ability and acquirer returns. *Q. Rev. Econ. Finance* 68, 171–182.
- Chen, Y., Podolski, E.J., Veeraraghavan, M., 2015. Does managerial ability facilitate corporate innovative success? *J. Emp. Finance* 34, 313–326.
- Demerjian, P.R., Lev, B., Lewis, M.F., McVay, S.E., 2013. Managerial ability and earnings quality. *Account. Rev.* 88 (2), 463–498.
- Demerjian, P., Lev, B., McVay, S., 2012. Quantifying managerial ability: a new measure and validity tests. *Manage. Sci.* 58 (7), 1229–1248.
- Just, M., Echaust, K., 2020. Stock market returns, volatility, correlation and liquidity during the COVID-19 crisis: evidence from the Markov switching approach. *Finance Res. Lett.*
- Manso, G., 2011. Motivating Innovation. *J. Finance* 66 (5), 1823–1860.
- Neukirchen, D., Engelhardt, N., Krause, M., Posch, P.N., 2021. Firm efficiency and stock returns during the COVID-19 crisis. *Finance Res. Lett.*
- Phan, D., Narayan, P., 2020. Country responses and the reaction of the stock market to COVID-19—A preliminary exposition. *Emerg. Mark. Finance Trade* 56 (10), 2138–2150.
- Pinkowitz, L., Williamson, R., 2004. What is a dollar worth? The market value of cash holdings. In: Unpublished Working Paper.
- Ramelli, S., Wagner, A.F., 2020. Feverish stock price reactions to Covid-19. *Rev. Corp. Finance Stud.* 9 (3), 622–655.
- Rizwan, M.S., Ahmad, G., Ashraf, D., 2020. Systemic risk: the impact of COVID-19. *Finance Res. Lett.*
- Tsai, J.-F., Mai, N.T., Bui, D.G., 2021. Managerial ability, financial constraints, and the value of cash holding. *Appl. Econ. Lett.*