مجلة البحوث المالية والتجارية

المجلد (23) – العدد الرابع – أكتوبر 2022

Managerial ability and the efficiency of working capital

Dr. Mahmoud Ahmed

Assistant Professor – Accounting

Faculty of Commerce, Sohag University

mahmoud_mahmoud4@commerce.sohag.edu.eg

رابط المجلة: https://jsst.journals.ekb.eg/

Managerial ability and the efficiency of working capital

Abstract

This paper investigates the link between managers' ability and working capital efficiency. The main conjecture of the study is that managerial ability is positively associated with working capital efficiency. Using a sample of US companies, the paper finds that increased managerial ability moves the working capital toward the optimal level. This study extends the working capital management literature by showing that working capital efficiency is not only elicited by a firm's characteristics but also by managerial ability. This result sheds light on the benefits of hiring managers with higher abilities.

JEL classification: **M10, G01,G30**
Keywords: **working capital efficiency, working capital management, managerial ability.**

1. INTRODUCTION

Working capital is an important indication of companies' liquidity and financial health; it helps to fund companies' current operations and invest in future activities and growth. Management of net working capital (NWC) is, therefore, an integral part of the financial management of corporations because it has a noticeable impact on the performance and profitability of companies (Shin & Soenen, 1998).

There is extensive literature on the factors that specify the level of NWC, which mainly focuses on firm characteristics. However, the relationship between the level of NWC and the manager's ability has not yet been established. Harris (2005) argues that companies may face difficulties in managing working capital if the manager does not determine the working capital determinants and the optimal level of working capital. Furthermore, many studies (e.g., Hambrick and Finkelstein (1990), Papadakis and Barwise (2002) and Talaulicar, Grundei and Werder (2005)) observed that managers and managerial characteristics are essential in decision making in general. Thus, besides firm characteristics, managers' abilities might influence the level of NWC.

Higher-ability managers are expected to optimize NWC investment because they are more knowledgeable about their business (Demerjian, Lev, Lewis & Mcvay, 2013), deal more efficiently with their resources (Demerjian, Lev & Mcvay, 2012), better predict product demand and industry trends (Bonsall, Holzman & Miller, 2016), and have a thorough understanding of the operating environment of companies (Demerjian et al., 2012). Also, High-ability managers have been shown to be receptive to risk-taking (Yung and Chen, 2017). Consequently, this study hypothesizes that managerial ability is positively associated with NWC efficiency.

This paper uses a sample of 8,053 unique publicly listed US firms over the period of 2016 through 2020. The regression analysis indicates that higher-ability managers reduce (increase) the level of NWC if the firm overinvests (underinvests) in NWC. Hence, this study provides empirical evidence that higher-ability managers are more efficient in managing their NWC by converging toward the optimal level of NWC.

This study is important, since prior studies only focus on firm

characteristics and macro-economic factors as determinants of the level of NWC (Akinlo, 2012; Mansoori & Muhammad, 2012; Abbadi & Abbadi, 2013; Mongrut, O'Shee, Zavaleta & Zavaleta, 2013; Wasiuzzaman & Arumugam, 2013; Atsaye, Uguwu & Takon, 2015). Furthermore, firms invest large amounts of cash in NWC, and NWC has a significant impact on firm value and profitability. Therefore, it is important to understand whether higher-ability managers manage their NWC in a more efficient way. Thus, this research further the working capital management (WCM) literature by examining another factor that might influence investment in NWC. This research also contributes to the managerial-ability literature by examining another channel through which higher-ability managers might add value to the company. In practice, this information may be valuable when considering the costs and benefits of hiring a higher-ability manager as some papers argue that managerial ability reflects managerial entrenchment (Song and Wan, 2019).

This paper is structured as follows: section 2 gives a review of relevant literature and discusses the hypotheses. Section 3 describes the sample selection, and section 4 describes the methodology. Section 5 analyses the results of the study, while section 6 presents the conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 *The optimal level of NWC*

Efficient management of NWC has a significant impact on profitability and firm value. Several researchers found that the association between profitability and the cash conversion cycle (CCC) is negative (Charitou, Elfani & Lois, 2016; Deloof, 2003; Eljelly, 2004; Nobanee, Abdullatif & Alhajjar, 2011; Shin & Shoenen, 1998). The CCC is the standard measure of WCM and measures the time lag between investment in inventory and the collection of money from sales. From these studies, one could suggest that a lower CCC is always better. However, the relationship between NWC and profitability is much more complex, because investments in NWC have both positive and negative effects. On the one hand, larger inventories provide an insurance against price fluctuations and reduce the probability of stock-outs (Fazzari & Petersen, 1993), while selling on credit

helps to build a long-term relationship with customers (Long, Malitz & Ravid, 1993). On the other hand, investments in NWC require extra finance, which increases financing costs and may increase bankruptcy risk. The potential benefits and costs imply that NWC has an optimal level that maximizes firm performance (Aktas, Croci & Petmezas, 2014). Firms with a high level of NWC face a negative relationship between additional investments in NWC and firm performance, while firms with a low level of NWC face a positive relationship between additional investments in NWC and firm performance (Aktas et al., 2014). This relationship is empirically examined by Aktas et al. (2014), who observed that firms which converge toward the optimal level of NWC improve their stock and operating performance. Also, Lazaridis and Tryfonidis (2006) argue that keeping the NWC to an optimal level is beneficial for companies. Furthermore, Kieshnick, Laplante and Moussawi (2006) observe that firms tend, on average, to overinvest in NWC. The market recognizes this overinvestment and discounts firms for it (Kieshnick et al., 2006), which leads to a reduction in firm value. Moreover, Zariyawati et al. (2010) identify that inefficient working capital decisions have a negative impact on firm value. These results suggest that efficient management of NWC (i.e., converging toward the optimal level of NWC) increases the value of the company.

Prior research finds that countries with safer legal systems and better investor protection have more efficient working capital (Mättö and Niskanen, 2020). In addition, Gill et al. (2022) show that IT investment reduces the inventory holding period and the cash conversion cycle (CCC), and, thereby, improving WCM efficiency.

In addition, the literature show that higher-quality financial reporting improves the efficiency of capital by addressing both over- and under-investment (Biddle, Hillary and Verdi 2009; García Lara, García Osma and Penalva 2016). I follow the model used by those latter papers to test the effect of managerial ability on reducing both under- and over-investment in NWC. This model is described in section III.

2.2 ***Managerial ability***

Several studies have been conducted on the association between managerial ability and firm-related consequences. Most of these studies focus on future performance benefits due to the efficient

management of resources (Bonsall et al., 2016). These studies identify several channels through which managerial ability adds value to the company. Bonsall et al. (2016) conjecture that higher-ability managers better predict industry trends and product demand, which leads to higher and more stable future earnings, and, thereby, lower default risk and a higher credit rating (Bonsall et al., 2016). Furthermore, higher-ability managers have higher precision in estimating accruals leading to higher earnings quality (Demerjian et al., 2013). Moreover, Krishnan and Wang (2015) observe that firms managed by higher-ability managers pay lower audit fees and face a lower likelihood of receiving a going concern opinion because these firms have higher earnings quality and face a lower risk of firm failure. In addition, higher-ability managers have been shown to engage more in tax avoidance strategies which results in a reduction in the tax payments of the firm (Koester, Shevlin & Wangerin, 2016). Also, managers with high abilities have been shown to be receptive to risk-taking (Yung and Chen, 2017). However, the managerial ability could be associated with more entrenchment (Song and Wan, 2019).

2.3 *Hypotheses*

Prior literature indicates that higher-ability managers have better knowledge of their business (Demerjian et al., 2013), deal more efficiently with the firm's resources (Demerjian et al., 2012), better predict product demand and industry trends (Bonsall et al., 2016) and have a greater understanding of the firm's operating environment (Demerjian et al., 2012). Hence, the expectation is that higher-ability managers optimize NWC investment.
Therefore, this study contains two hypotheses:

H1: Within firms vulnerable to underinvestment, firms with higher managerial ability invest more in NWC.

H2: Within firms vulnerable to overinvestment, firms with higher managerial ability invest less in NWC.

3. METHODOLOGY

3.1 *Empirical model*

I follow the approach of Biddle et al. (2009) as well as García Lara et al. (2016); both papers tested the effect of reporting quality on

investment efficiency. According to their methodology, the effect of managerial ability on reducing both under- and overinvestment in NWC can be investigated using the following model[1]:

$$NWC = \beta_0 + \beta_1\, MA-Score + \beta_2\, MA-Score \times Underinvest + \beta_3 Underinvest + \beta_4 Lev + \beta_5 ROA + \beta_6 Tang + \beta_7 Mkt_{share} + \beta_8 \log(sale) + Year\ FE + (Industry\ FE +) FirmFE + \varepsilon \qquad \textit{Equation (1)}$$

Where *NWC* is the net working capital scaled by sales.[2] *Underinvest* is a proxy to identify industry-year combinations where there is aggregate under or overinvestment. To create this variable, the following regression is estimated (Biddle et al., 2009; García lara et al., 2016):

$$NWC_{I,t} = \beta_0 + \beta_1\, Sales\_growth_{I,t} + \varepsilon_{I,t} \qquad \textit{Equation (2)}$$

Where $NWC_{I,t}$ is the average NWC ratio of all firms in each industry-year group. $Salesgrowth_{I,t}$ is the mean sales growth of all firms in each group of industry-years (a proxy for investment opportunities). The residuals are then multiplied by -1, ranked into deciles and rescaled from 0 to 1. These rankings represent the *Underinvest* variable. High (low) values of the variable *underinvest* give an indication that the firm underinvests (overinvests) in NWC.[3]

The conjecture is that higher-ability managers increase (decrease) the level of NWC if the firm underinvests (overinvests) in NWC. Thus, if the firm underinvests in NWC (i.e. underinvest=1), it is expected that β_3 is positive, also the sum of β_1 and β_3 is positive, indicating that higher-ability managers increase the level of NWC if the firm underinvests in NWC. If the firm overinvests in NWC (i.e. underinvest=0), the expectation is that β_1 is negative, indicating that higher-ability managers reduce the level of NWC if the firm overinvests in NWC.

In this paper, I include several control variables identified by prior research as determinants of the level of NWC:

[1] Subscript '*it*' is removed for brevity

[2] Throughout the empirical analysis NWC denotes NWC to sales. Scaling variables by a measure of firm size (e.g. asset or sales) will make observations comparable by controlling for differences in firms' size. In addition, regression analyses are likely to be less reliable when performed on variables that are not deflated.

[3] The median is used to partition the sample.

Asset tangibility (*Tang*): Asset tangibility (i.e., the proportion of fixed assets) affects the level of working capital. On the one hand, firms which invest more in fixed assets have less funds available to invest in working capital, so a negative relationship is expected. But on the other hand, firms with more intangible assets (lower proportion of fixed assets) have more asymmetric information problems due to difficulties in the valuation of intangible assets (Wasiuzzaman & Arumugam, 2013), leading to a lower level of *NWC*. Based on this reasoning, a positive relationship is expected.

Market share (*Mkt_share*): The market share of a firm is another variable that affects the level of *NWC*. Larger firms can negotiate better credit terms with their suppliers, which reduces the level of *NWC* (Hill et al., 2010). However, larger firms face increased monitoring which reduces information asymmetry (Brennan & Hughes, 1991), which leads to an increase in the level of *NWC*.

Leverage (*Lev*): A firm wants to finance investments with internal funds to reduce monitoring by shareholders and the issuance costs of both debt and equity (Wasiuzzaman & Arumugam, 2013). So, a firm with more debt has less internal financing available for daily operations. In this case, firms are very vigilant of further funds shortage problems, resulting in efficient working capital (Wasiuzzaman & Arumugam, 2013).

Profitability (*ROA*): Profitable firms have more cash to invest, so these firms put less emphasis on working capital (Nazir & Afza, 2009). Also, more profitable firms have more bargaining power, which results in receiving more credit from suppliers (Petersen & Rajan, 1997), which reduces the level of working capital.

Year-fixed effects: The level of NWC changes over time. For example, Aktas et al. (2014) observe a decreasing time trend in the level of the NWC-to-sales ratio. This change is mainly due to the adoption of just-in-time inventory system (Aktas et al., 2014).

Industry-fixed effects: Hawawini, Viallet, and Vora (1986) argue that the industry has a significant impact on the level of NWC. To classify industries, the 48-industry classification of Fama and French (1997) will be used.

Firm-fixed effects: I use firm fixed effects to control firm characteristics that are persistent over time, e.g., firm culture could affect the type of managers they attract as well as the level of investment efficiency.

3.2 *Sample selection*

I use MA-SCORE data provided by Demerjian et al. (2012) from 2016 through 2020.[4] This data is then merged with financial data from Worldscope. After merging the data, the final sample contains 15,142 observations of 8,053 unique publicly listed US firms from 2016 through 2020. Banks have been removed as they are subject to different regulations. In addition, NWC is likely to have a different meaning in banks. Any observation with missing data, negative sales, negative assets, negative debt or duplicate values is removed. Moreover, all continuous variables are winsorized at the first and 99th percentile to mitigate the influence of extreme values.

4. RESULTS

Descriptive statistics

Table 1 presents the descriptive statistics of the variables included in the regression model for the full sample. The mean of the NWC is 13%, which implies that the average firm invests 13% of the total sales in NWC. This statistic is very close to that reported by Aktas et al. (2014) and Hill et al. (2010) respectively. MA-Score has a mean of -0.001 indicating that the average firm has an average level of managerial ability. Table 2 presents the industry distribution of the NWC based on the 48-industry classification of Fama and French (1997). The utility industry, with a mean of 3.61%, has the smallest NWC, while the textile industry, with a mean of 31%, has the highest NWC. There is substantial variation in the NWC across the different industries based on table 2. This shows that the level of NWC is partly determined by the industry, which is consistent with the findings of Hawawini et al. (1986). This result justifies controlling for the industry fixed effects as well as industry × year fixed effects to control for time-invariant industry differences across firms as well as time-varying industry changes.

[4] This data is retrieved from: https://peterdemerjian.weebly.com/managerialability.html

Table 1: Descriptive statistics

	Mean	Median	SD	Min	P25	P75	Max
NWC	0.133	0.111	0.142	-0.172	0.029	0.217	0.447
MA_SCORE	-0.001	-0.037	0.168	-0.282	-0.104	0.053	0.697
underinvest	0.413	0.333	0.290	0.000	0.111	0.667	1.000
Lev	0.225	0.186	0.208	0.000	0.024	0.362	0.678
ROA	-0.083	0.011	0.254	-0.910	-0.108	0.059	0.145
Tang	0.255	0.156	0.252	0.000	0.062	0.380	0.987
Mkt_share	0.013	0.001	0.051	0.000	0.000	0.006	1.000
Sale	4326.107	496.098	11665.884	0.027	65.369	2538.542	75653.089

This table shows the descriptive statistics for the test sample. Definitions of variables are included in the Appendix

Table 2: Industry distribution of the NWC

Industry	Mean	Median	Std.dev.
Agriculture	0.16	0.13	0.16
Aircraft	0.23	0.22	0.12
Almost Nothing	0.07	0.03	0.10
Apparel	0.26	0.26	0.10
Automobiles and Trucks	0.19	0.19	0.13
Beer & Liquor	0.19	0.18	0.15
Business Services	0.10	0.08	0.14
Business Supplies	0.16	0.15	0.10
Candy & Soda	0.17	0.12	0.15
Chemicals	0.15	0.14	0.11
Coal	0.07	0.07	0.08
Communication	0.05	0.04	0.08
Computers	0.17	0.16	0.12
Construction	0.30	0.32	0.15
Construction Materials	0.20	0.19	0.12
Consumer Goods	0.17	0.16	0.15
Defense	0.25	0.26	0.09
Electrical Equipment	0.20	0.20	0.15
Electronic Equipment	0.19	0.18	0.13
Entertainment	0.01	0.01	0.08
Fabricated Products	0.20	0.19	0.10
Food Products	0.15	0.13	0.13
Healthcare	0.10	0.09	0.12
Insurance	0.13	0.14	0.12
Machinery	0.22	0.22	0.12
Measuring and Control Equipment	0.20	0.20	0.13

Medical Equipment	**0.16**	**0.15**	**0.15**
Non-Metallic and Industrial Metal Mining	**0.07**	**0.07**	**0.09**
Personal Services	**0.07**	**0.04**	**0.10**
Petroleum and Natural Gas	**0.04**	**0.02**	**0.10**
Pharmaceutical Products	**0.05**	**0.02**	**0.12**
Precious Metals	**0.04**	**0.04**	**0.07**
Printing and Publishing	**0.12**	**0.10**	**0.10**
Real Estate	**0.11**	**0.04**	**0.17**
Recreation	**0.22**	**0.22**	**0.17**
Restaurants, Hotels, Motels	**0.02**	**0.01**	**0.09**
Retail	**0.17**	**0.14**	**0.16**
Rubber and Plastic Products	**0.20**	**0.19**	**0.10**
Shipbuilding, Railroad Equipment	**0.21**	**0.16**	**0.12**
Shipping Containers	**0.10**	**0.09**	**0.07**
Steel Works Etc	**0.24**	**0.24**	**0.15**
Textiles	**0.31**	**0.29**	**0.09**
Tobacco Products	**0.16**	**0.16**	**0.08**
Trading	**0.07**	**0.01**	**0.14**
Transportation	**0.05**	**0.02**	**0.09**
Utilities	**0.03**	**0.02**	**0.03**
Wholesale	**0.24**	**0.26**	**0.17**

This table shows the mean, median and standard deviations of NWC across Fama-French 48 industries.

Correlation matrix

Table 3 presents the correlation matrix. The correlation between the outcome variable (*NWC*) and the test variable (*MA-SCORE*) is 0.01 and statistically insignificant. The fact that there is an insignificant correlation between the independent and outcome variables is not inconsistent with the hypothesis. Since, as argued before, this study focuses more on the effect of managerial ability on investment efficiency rather than investment per se. The expectation is that higher-ability managers reduce the level of *NWC* if the firm overinvests in *NWC*. So, the correlation between the *MA-SCORE* and the *NWC* is meaningless since it does not take into account the current level of *NWC*. In the regression analysis, this problem is addressed, since the model is modified such that the effect of the *MA-SCORE* on the *NWC* can be estimated if the firm over(under)invests.

Based on the correlation matrix, there is no indication for multicollinearity since all the correlation coefficients are smaller

than the conventional thresholds.[5]

Table 3: Correlation matrix

	1	2	3	4	5	6	7
1. MA_SCORE	-						
2. Underinvest	**-.02***	-					
3. NWC	**0.01**	**.50*****	-				
4. ROA	**.06*****	**.15*****	**.25*****	-			
5. Lev	**-.12*****	**-.10*****	**-.12*****	**.07*****	-		
6. Tang	**-.07*****	**-.26*****	**-.26*****	**.12*****	**.26*****	-	
7. Mkt_share	**0.00**	**.11*****	**0.00**	**.12*****	**.04*****	**.03*****	-
8. Sale	**.29*****	**.05*****	**-.07*****	**.18*****	**.05*****	**.05*****	**.36*****

Notes: This table exhibits the Pearson correlation coefficients among the main variables used in tests. Definitions of variables are included in the Appendix. *, **, and * indicate significance at the 10%, 5%, and 1% levels respectively (two-tailed).**

Multivariate results

Table 4 presents the regression results (also, the results are shown graphically in figure one) of equation 1. A positive coefficient on β_3 as well as on the sum of β_1 and β_3 are used to provide evidence consistent with H1, as discussed before. According to table 4, the coefficient on $\beta_{3\ is}$ positive and significant *(0.082, t.statistic=4.1).*[6] Also, using the linear combinations test of coefficients, the sum of β_1 and β_3 is significant and positive[7]. Therefore, it can be concluded that higher-ability managers increase the level of *NWC* if the firm underinvests in *NWC*. The variable MA-SCORE (β_1) is negative but statistically insignificant. This result tentatively supports the second hypothesis that higher-ability managers reduce the level of *NWC* if the firm overinvests in *NWC*. Hence, this result provides evidence for both hypotheses and shows that higher-ability managers converge toward the optimal level of *NWC*. Nevertheless, the insignificant coefficient on MA-score entails being cautious in drawing strong inferences about

[5] The VIF, not reported in this paper, gives also no indication of multicollinearity because for none of the variables the VIF exceeds 10.

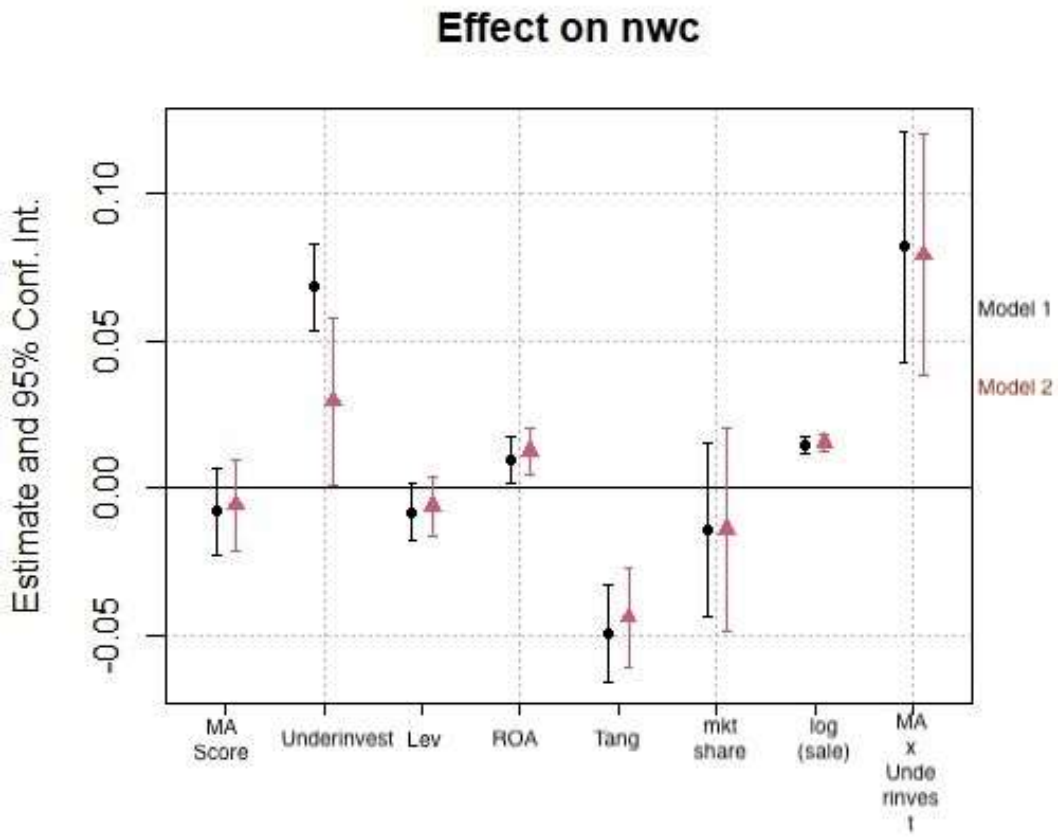
[6] The t statistic is the coefficient divided by its standard error. Standard errors are shown between parentheses in table 4.

[7] This test was conducted using the "multcomp" package in R.

overinvestment.

Concerning the control variables, *LEV*, as predicted in section 3.1, has a negative (albeit insignificant) effect on the *NWC*. A negative coefficient on *LEV* supports the theory that firms want to use internal financing first, so firms with more debt have less internal funds available, which results in the efficient management of NWC to avoid further funds shortage problems (Wasiuzzaman & Arumugam, 2013). In addition, *ROA* is positive and significant at the 5% level. This result is inconsistent with the prior findings of Abbadi and Abbadi (2013), Mansoori and Muhammad (2012) and Nazir and Afza (2009) who find a negative relationship. A possible explanation for this mixed evidence is that more profitable firms have more bargaining power, which results in receiving more credit. *Tang* (i.e. the proportion of fixed assets) has a negative and statistically significant effect on NWC consistent with the idea that firms which invest more in fixed assets have less funds available to invest in working capital. Also, *MKT_share* is negative and insignificant. A possible explanation for this result is that larger firms can negotiate better credit terms (Hill et al., 2010). The result is contrary to the findings of Hill et al. (2010) who find no effect. This result is confirmed by Baños-Caballero et al. (2010), Fazzari and Petersen (1993). Finally, *log(sale)* has a positive and significant effect on NWC consistent with the idea that larger firms invest more in NWC.

Figure 1



This graph shows the coefficients plot for the regression results presented in Table 4 at 95% confidence interval. Model one coefficients are represented in black while model 2 coefficients are represented in red.

Table 4: The effect of managerial ability on investment efficiency

	Model 1	Model 2
MA_score	-0.008	-0.006
	(0.008)	(0.008)
underinvest	0.068***	0.029**
	(0.007)	(0.014)
MA_score × underinvest	0.082***	0.079***
	(0.020)	(0.021)
Lev	-0.008	-0.006
	(0.005)	(0.005)
ROA	0.010**	0.012***
	(0.004)	(0.004)
Tang	-0.049***	-0.044***
	(0.008)	(0.009)
Mkt_share	-0.014	-0.014
	(0.015)	(0.018)
log(sale)	0.015***	0.015***
	(0.001)	(0.001)
$\beta_1 + \beta_3$	.0740***	.0731***
	(0.015)	(0.016)
Obs.	15,142	15,142
R2	0.922	0.925
Std.Errors	IID	IID
Year FE	Yes	
Year × Industry FE		Yes
Firm FE	Yes	Yes

This table shows the regressions' results for the association between managerial ability and investment efficiency. SE in parentheses are corrected for heteroscedasticity. The extreme values of all continuous variables are winsorized at the 1% and 99% levels. Definitions of variables are presented in Appendix. *, **, and * indicate significance at the 10%, 5%, and 1% levels respectively (two-tailed); standard error are shown between parentheses.**

5. CONCLUSION

This study examines the association between managerial-ability and the over- and underinvestment in NWC. The main conjecture of the study is that higher-ability managers reduce both the under- and overinvestment in NWC. This study provides empirical evidence in line with the conjecture that higher-ability managers converge toward the optimal level of NWC. It, also, contributes to the relatively new field of managerial ability, by examining an important economic consequence of managerial ability on companies' value. Furthermore, this study contributes to the field of working capital management, by investigating another factor that influences the level of NWC. These results may be valuable in practice when considering the cost and benefits of hiring a higher-ability manager.

There are several limitations in this study that should be mentioned. *First,* this study only contains data from publicly listed US corporations, since the MA-SCORE data is only available for publicly listed US corporations. *Second,* this study only uses one proxy for each variable while each variable can be measured with different proxies. If other proxies would be used, the results could be different. Due to those limitations, the results should be carefully interpreted.

Future research could continue to focus on managerial characteristics that might influence the level of NWC. Prior research mainly focuses on firm and macroeconomic characteristics as determinants of the level of NWC. This study, however, shows that the ability of a manager has a significant impact on the level of NWC. Hence, it would be interesting to examine which other CEO characteristics (e.g., overconfidence) might influence the level of NWC.

REFERENCES

Abbadi, S. M., & Abbadi, R. T. (2013). The Determinants of Working Capital Requirements in Palestinian Industrial Corporations. ***International Journal of Economics and Finance, 5,*** **65-75.**

Akinlo, O. O. (2012). Determinants of Working Capital Requirements in Selected Quoted Companies in Nigeria. ***Journal of African Business, 13,*** **40-50.**

Aktas, N., Croci, E., & Petmezas, D. (2014). Is working capital management value- enhancing? Evidence from firm performance and investments. ***Journal of Corporate Finance, 30,*** **98–113.**

Atsaye, F. A., Uguwu, J. I., & Takon, S. (2015). Determinants of working capital management theoretical review. ***International Journal of Economics, Commerce and Management, 3 (2).***

Baños-Caballero, S., García-Teruel, P. J. & Martínez-Solano, P. (2010). Working capital management in SMEs. ***Accounting & Finance, 50,*** **511–527.**

Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? ***Journal of Accounting and Economics, 48,*** **112-131.**

Bonsall, S. B., Holzman, E. R., & Miller, B. P. (2016). Managerial Ability and Credit Risk Assessment. ***Management Science,*** **63(5), 1425-1449.**

Brennan, M. J., & Hughes, P. J. (1991). Stock Prices and the Supply of Information. ***The Journal of Finance, 46,*** **1665–1691.**

Charitou, M., Elfani, M., & Lois, P. (2016). The Effect of Working Capital Management On Firm's Profitability: Empirical Evidence from An Emerging Market. ***Journal of Business & Economics Research, 14,*** **111-117.**

Deloof, M. (2003). Does Working Capital Management Affect Profitability of Belgian Firms? ***Journal of Business Finance and Accounting, 30,*** **573-588.**

Demerjian, P. R., Lev, B., Lewis, M. F., & Mcvay, S. E. (2013). Managerial Ability and Earnings Quality. ***The Accounting Review, 88,*** **463-498.**

Demerjian, P., Lev, B., & Mcvay, S. (2012). Quantifying Managerial Ability: A New Measure and Validity Tests. ***Management Science, 58,*** **1229-1248.**

Miller, D., & De Vries, M. F. R. (1986). Personality, Culture, and Organization. ***The Academy of Management Review, 11(2),*** **266-279.**

Eljelly, A. M. A. (2004). Liquidity - profitability tradeoff: An empirical investigation in an emerging market. ***International Journal of Commerce and Management,*** **14, 48-61.**

Fama, F. E., & French K. R. (1997). Industry costs of equity. ***Journal of Financial Economics, 43,*** **153-193.**

Fazzari, S. M., & Petersen, B. C. (1993). Working Capital and Fixed Investment: New Evidence on Financing Constraints. ***The RAND Journal of Economics, 24,*** **328-342.**

Finkelstein, S., & Hambrick, D. C. (1990). Top Management Team Tenure a Organizational Outcomes: The Moderating Role of Managerial Discretion. ***Administrative Science Quarterly, 35,*** **484–503.**

García Lara, J. M., García Osma, B., & Penalva, F. (2016). Accounting conservatism and firm investment efficiency. ***Journal of Accounting and Economics, 61 (1),*** **221-238.**

Gill, A., Kang, P., & Amiraslany, A. (2022). Information technology investment and working capital management efficiency: evidence from India survey data. ***South Asian Journal of Business Studies*****.**

Hambrick, D. C., & Mason, P. (1984). Upper Echelons: The Organization as a Reflection of its Top Managers. ***Academy of Management Review, 9,*** **193–206.**

Harris, A. (2005). Working capital management: difficult, but rewarding. ***Financial executive, 21(4),*** **52-53.**

Hawawini, Viallet, G. P., & Vora, A. (1986). Industry influence on corporation working capital Decisions. ***Sloan Management Review, 27*****: 15-24.**

Hill, M. D., Kelly, G. W., & Highfield, M. J. (2010) Net Operating Working Capital Behavior: A First Look. ***Financial Management, 39*****: 783–805.**

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. ***The American Economic Review, 76(2),*** **323-329.**

Kieshnick, R., Laplante, M., & Moussawi, R. (2006). Corporate

working capital management: Determinants and Consequences. Baylor University, November 2006.

Koester, A., Shevlin, T., & Wangerin, D. (2016). The Role of Managerial Ability in *Corporate Tax Avoidance. Management Science*, 1-27.

Krishnan, G. V., & Wang, C. (2015). The relation between managerial ability and audit fees and going concern opinions. Auditing: *A Journal of Practice & Theory, 34(3),* 139- 160.

Lazaridis, I., & Tryfonidis, D. (2006). Relationship Between Working Capital Management and Profitability of Listed Companies in the Athens Stock Exchange. *Journal of Financial Management and Analysis*, *19*, 1-12.

Long, M. S., Malitz, I. B., & Ravid, S. A. (1993). Trade credit, quality guarantees and product marketability. *Financial Management, 4,* 117-127.

Mättö, M., & Niskanen, M. (2021). Role of the legal and financial environments in determining the efficiency of working capital management in European SMEs. *International Journal of Finance & Economics*, *26*(4), 5197-5216.

Mansoori, E., & Muhammad, D. D. J. (2012). Determinants of working capital management: Case of Singapore firms. *Research Journal of Finance and Accounting, 3,* 15-23.

Yung, K., & Chen, C. (2018). Managerial ability and firm risk-taking behaviour. *Review of Quantitative Finance and Accounting*, *51*(4), 1005-1032.

Mathuva, D. (2009). Influence of working capital management components on corporate profitability: A survey on Kenyan listed firms, *Research Journal of Business Management, 3,* 1-11.

Mongrut, S., O'Shee, D. F., Zavaleta, C. C., & Zavaleta, J. C. (2013). Determinants of Working Capital Management in Latin American Companies. *Revista Innovar Journal, 24,* 5-18.

Nazir, M. S., & Afza, T. (2009). Working Capital Requirements and the Determining Factors in Pakistan. *Journal of Applied Finance. 15 (4),* 8-19.

Nobanee, H., Abdullatif, M., & Alhajjar, M. (2011). Cash conversion cycle and firm's performance of Japanese firms. *Asian Review*

of Accounting, 19, **147-156.**

Nunn, K. P. (1981). The strategic determinants of working capital: a product-line perspective. ***The Journal of Financial Research*****, 4(3), 207-219.**

Papadakis, V. M., & Barwise, P. (2002). How Much do CEOs and Top Managers Matter in Strategic Decision-Making? ***British Journal of Management, 13*****, 83–95.**

Petersen, M. A., & Rajan, R. G. (1997). Trade Credit: Theories and Evidence. ***The Review of Financial Studies,10 (3)*****, 661-691.**

Shin, H. H., & Soenen, L. (1998). Efficiency of Working Capital and Corporate Profitability. ***Financial Practice and Education*****, 8, 37–45.**

Song, W. L., & Wan, K. M. (2019). Does CEO compensation reflect managerial ability or managerial power? Evidence from the compensation of powerful CEOs. ***Journal of Corporate Finance,*** **56, 1-14.**

Talaulicar, T., Grundei, J., & Werder, A. V. (2005). Strategic decision making in start-ups: the effect of top management team organization and processes on speed and comprehensiveness. ***Journal of Business Venturing, 20,*** **519-541.**

Wasiuzzaman, S., & Arumugam, V. C. (2013). Determinants of Working Capital Investment: A Study of Malaysian Public Listed Firms. ***Australasian Accounting Business & Finance Journal, 7, 49*****-69.**

Zariyawati, M. A., Taufiq, H., Annuar, M. N., & Sazali, A. (2010). Determinants of Working Capital Management: Evidence from Malaysia. ***Financial Theory and Engineering 2010 international conference,*** **190-194.**

Appendix A: Variable definitions

Dependent variable:	
NWC	**= This variable measures the amount of investment in which is calculated by the ratio of inventories plus receivables minus payables to sales.**
Independent variable:	
MA-SCORE	**= This variable measures the ability of a manager, developed by Demerjian et al. (2012).**
MA-SCORE x underinvest	**= Interaction term between the MA-SCORE and the variable underinvest.**
Underinvest	**= a proxy to detect whether a firm under- or overinvest in NWC (Biddle et al., 2009; García Lara et al., 2016).**
Control variables:	
Tang	**= the asset tangibility of the firm, which is calculated by the ratio of PPE-to- total assets (Kieshnick et al., 2006).**
Mkt_share	**= the market share of the firm; the ratio of the sales of a given firm to the total annual sum of sales in a given industry is used to measure the market share (Hill et al., 2010).**
Lev	**= the leverage of the firm, which is calculated by the ratio of total debt to total assets (Mansoori & Muhammad, 2012).**
ROA	**= the profitability of the firm, which is calculated by dividing the firm's net income by its total assets.**
Year FE	**= a dummy variable for years, to capture time-specific effects.**
Industry FE	**= a dummy variable for the different industries based on the 48-industry classification of Fama and French (1997).**
Firm FE	**= a dummy variable for firms, to capture firm-specific effects.**