RESEARCH ARTICLE

Investigating the Relationship between Working Capital Management and Stock Price Crash Risk

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ABSTRACT

The main purpose of this study is to investigate the effect of working capital management on stock price crash risk. The sample includes 103 Iranian firms listed on the Tehran Stock Exchange from 2013 to 2017. Panel data analysis with fixed effect estimation has been used to analyze the relationship between working capital management and stock price crash risk. Cash conversion cycle, working capital requirement, current, and quick ratios were applied as comprehensive measures for working capital management, and Hutton's model was applied as a measure for stock price crash risk. The results indicate that there is a negative relationship between working capital indicators and stock price crash risk. Therefore, managers can use working capital strategies to decrease the risk of the stock price crash. Furthermore, asymmetry information may, in fact, increase a manager's incentive to use working capital strategies to reduce the stock price crash risk.

Keywords: Stock Price Crash Risk, Tehran Stock Exchange, Working Capital

1. INTRODUCTION

Working capital management, which refers to managing current assets and liabilities of the corporations, has attracted the attention of many academics and professionals. The main part of working capital management is a trade-off between risk and return, that is, firms should hold sufficient amounts of current assets to run daily operations in a way that minimize the risk of insolvency. While the higher level of investment in working capital may reduce the risk of insolvency, an insufficient amount of current assets may cause shortages in daily operations. In addition, more investment in working capital might increase the opportunity cost of investment, especially for firms for which external financing is a primary source of financing. Therefore, the efficiency of working capital management depends highly on a trade-off between liquidity and profitability (Filbeck et al., 2007; Faulkender and Wang, 2006).

Managers can use several different strategies to manage working capital efficiently, such as being aggressive and conservative. Aggressive managers would choose aggressive working capital strategies. This means that major parts of current assets would be financed by short-term liabilities. The opportunity cost of using short-term financing is low since short-term financing has lower rates in comparison to long-term financing. However, to use an aggressive working capital strategy is quite risky since short-term financing is required to be purified in a short time, normally <1 year. If the company encounters temporary financial crises, higher short-term debts could lead to bankruptcy. Conservative strategies refer to using long-term debts to meet corporate working capital requirements (WCR). This strategy will decrease the liquidity risk since the maturity of long-term debts is normally more than 1 year, and firms have enough time to pay off these debts. However, the opportunity cost

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of long-term financing is high and will decrease the firms' profitability. The manager's attitude toward risk is one of the main criteria for appropriate working capital policies. Consequently, the efficiency of working capital management depends highly on the manger's personal preferences and judgments. Therefore, these preferences and judgments have a direct impact on the firms' performance. Failure to manage the optimal use of working capital may prevent the company from benefiting from high investment opportunities and could result in the company's stock price collapse.

2. WORKING CAPITAL MANAGEMENT AND STOCK PRICE CRASH RISK

Stock price crash risk refers to the management's tendency to retain bad news about the company. If managers are able to hide bad news for a long time, the distribution of stock returns could be asymmetric (Kothari et al., 2009; Hutton et al., 2009). The asymmetry information leads to a negative drop in stock price. The asymmetry information between shareholders and managers influences the firms' working capital strategies (Myers and Majluf, 1984). Managers could try to increase their power over firms by enhancing the probability of the corporations' survival and reducing the risk in business operations (Stulz, 2005). These types of agency problems between managers and shareholders will encourage managers to adopt conservative working capital strategies by keeping a high level of inventories and flexible trade credits. Conservative working capital strategies impose corporation by higher opportunity cost which leads to a decrease in the firms' capability to invest in projects with higher returns and the firm's value. However, the higher cost of external finance forces managers to decrease their investment in working capital (Chiou and Cheng, 2006).

Managers who have superior information about the firm's operational condition, as well as good motivation for hiding bad news, would decide to change the working capital strategies based on their judgments and preferences. Consequently, the manager's decision about working capital strategies would affect the firm's value and stock price (Mansoori and Mohammad, 2012).

This study contributes to the body of knowledge by identifying the relationship between working capital management and stock price crash risk. Moreover, it focuses on the effect of working capital management on a firm's crash risk and sheds more light on how managers affect crash risk by managing working capital efficiently. The theoretical contribution of this research is to enrich the existing literature by investigating the effects of working capital management on stock price crash risk in Iranian firms as a developing market.

3. LITERATURE REVIEW

The optimal level of working capital would result in decreasing the opportunity cost of holding an unnecessary amount of working capital and increasing the value of stock prices. Mansoori and Muhammad (2012) provided empirical evidence on the effects of working capital management and profitability for a sample of Singapore firms. The results indicate that managers can increase corporate profitability through efficient working capital strategies which then result in the firm's stock price boom. Bandara (2015) believes that management of working capital needs careful consideration because it plays a crucial rule in the firms' performance, risk, and value. He investigates the effect of working capital strategies and firms' value in 74 companies listed in Sri Lanka stock market exchange. The results show a negative relationship between managers' degree of aggressiveness and the market value of stock prices. Pouraghajan et al. (2015) argue that stock price might be affected by intra-organizational factors, which include different types of working capital policies. The result of panel data analysis in 110 Iranian firms listed in the Tehran stock exchange (TSE) revealed that aggressive working capital policies have a positive and significant effect on stock price changes. That is, managers can increase stock prices through reducing the level of investment in WCR. Decreasing the level of investment in working capital reduces the opportunity cost of investment in current assets which leads to increased profitability and firm stock price.

The effect of external variables such as macroeconomic variables on working capital strategies cannot be ignored. Moghaddamnia and Mansoori (2016) have examined the relationship between financial constraints and economic crises, and working capital management of companies listed in the TSE for the period of 2014–2015. The results of panel data analysis confirm that financial constraints and economic crisis have affected working capital management adversely. In other words, financial constraints and economic crises force managers to decrease the level of investment in working capital.

The marginal goal of financial managers is to maximize shareholder's wealth. Perera and Priyashantha (2018) have investigated the relationship between working capital

management and shareholders wealth in a sample of 50 companies listed in the Colombo Stock Exchange. The results of panel data analysis revealed that managers can increase shareholders' wealth and companies value through the efficiency of working capital management.

The information asymmetric between managers and shareholders would be a channel that affects the relationship between firm value and stock price crash risk. Audrey and Grace (2019) show that information asymmetric would be a channel for concealing information that mitigates stock price crash risk. They suggested that strong corporate governance can decrease the manager's incentives of concealing information.

4. RESEARCH METHODS

4.1. Data and Sample Selection

The required data for empirical testing of the research hypotheses were collected from Rahaword Nuwin database that included the secondary data of the financial statement of firms listed in the main board of the TSE. The samples were put up as follows; all active firms over the research period with completed required data were selected, and firms with incomplete data were excluded. Due to the specific nature of firms active in insurance, mutual funds, banking and finance, and business services, these firms were excluded. To investigate industry effects, the sectors with less than five firms were eliminated from the samples. The final data consisted of 515 firm-year observations that include the observation of 103 firms for 5 years from 2013 to 2017. Table 1 presents the sample distribution based on the industry sector.

Table 1: Samples distribution

Industry sector	Number of firms (%)
Non-metallic mineral	8 (7.76)
Automobile and parts	18 (17.47)
Pharmacy	20 (19 41)
Cement and plaster	9 (8.73)
Chemical	8 (7.76)
Food industry	8 (7.76)
Oil products	5 (4.8)
Basic metals	7 (7)
Ceramic and tile	6 (5.82)
Equipment and machinery	6 (5.82)
Metal products	8 (7.62)
Total	103 (100)

4.2. Variables

To examine the relationship between working capital management and stock price crash risk, four measures of working capital management were used as independent variables. These measures are the cash conversion cycle (CCC), WCR, current ratio (CR), and quick ratio (QR). These proxies have been applied by several recent studies as a measure for working capital management (Arachchi et al., 2017, Rostami and Mansooi, 2017).

Hutton Model (2009) has been used to measure the risk of stock price crash as an explanatory variable. According to Hutton et al. (2009), the stock price crash risk in a given fiscal year is a period during which a specific monthly return of a company is 2/3 times the standard deviation below its average monthly return. The basis of this definition is the statistical concept that with the assumption of the normal distribution of the specific monthly returns of the company, the fluctuations which are between the mean plus 2/3 of the standard deviation and the mean minus 2/3 of the standard deviation are considered as normal fluctuations. Therefore, fluctuations outside this distance are considered unusual. Given that stock price crash risk is an abnormal fluctuation; the number 2/3 is considered as the boundary between normal and unusual fluctuations. The specific monthly returns of the companies are calculated using the following equations:

$$W_{j,0}=Ln(1+\xi_{j,0}) \quad (1)$$

Where:

$W_{j,0}$=Monthly firm's return

$\xi j,\theta$=Error terms in the following equation:

$$r_{j,0}=\beta_0+\beta_{1j}r_{m,0-2}+\beta_{2j}r_{m,0-1}+\beta_{3j}r_{m,0}+\beta_{4j}r_{m,0+1}+\beta_{5j}r_{m,0+2}+\epsilon_{jt(} \quad (2)$$

Where:

$r_{j,0}$=Firm's monthly return

$r_{m,0}$=Market return=(market return at the beginning of month–market return at the end of month)/market return at the beginning of the month

ϵ_{jt}=Regression errors

Finally, using the company's specific monthly returns, the negative skewness of firm's return, and stock price crash risk is calculated as follows:

$$NCSKEW_{it}=-[n(n-1)^{3/2}\Sigma W_{it}]/[(n-1)(n-2)(\Sigma W_{it})^{3/2}] \quad (3)$$

Where;

NCSKEW: The negative skewness of the firms' stock return over the fiscal year t

W_{it}: Specific monthly returns of the firm (obtained from equation (2)

N: The number of months in which their returns are calculated.

Callen and Fang (2001) argue that the signs of stock price crash come about a year before the occurrence of this phenomenon, and one of the signs is the existence of a negative skewness in the stock returns of the company. Thus, companies that have experienced negative stock returns in the past year are likely to face crash stock prices next year. Habib and Hasan (2016) also argued that the negative skewness of stock returns is an alternative to measuring the asymmetry in the distribution of returns.

Several control variables have been applied to the module as control variables to control the effect of other important factors which affect stock price crash risk. These variables are leverage (LEV), market to book value ratio (MTB), return on assets (ROA), and mean and standard deviations of firm's monthly stock returns (MEAR and STDR). Table 2 summarizes the variables measurement.

4.3. Model Specification

To investigate the effect of working capital management on stock price crash risk, four research models have been conducted. The first model tries to investigate the relationship between CCC and stock price crash risk. The second model examines the relationship between WCR and stock price crash risk. The third model is related to the relationship between CR and stock price crash risk. Finally, the last model analyses the relationship between QR and stock price crash risk. All the models are presented as follows;

Model 1) $\text{Crash Risk}_{it}=\beta_0+\beta_1 CCC_{it}+\beta_2 MTB_{it}+\beta_3 MEAR_{it}+\beta_5 SDTR_{it}+\beta_6 LEV_{it}+\beta_7 ROA_{it}+\varepsilon_{it}$

Model 2) $\text{Crash Risk}_{it}=\beta_0+\beta_1 WCR_{it}+\beta_2 MTB_{it}+\beta_3 MEAR_{it}+\beta_5 SDTR_{it}+\beta_6 LEV_{it}+\beta_7 ROA_{it}+\varepsilon_{it}$

Model 3) $\text{Crash Risk}_{it}=\beta_0+\beta_1 CR_{it}+\beta_2 MTB_{it}+\beta_3 MEAR_{it}+\beta_5 SDTR_{it}+\beta_6 LEV_{it}+\beta_7 ROA_{it}+\varepsilon_{it}$

Model 4) $\text{Crash Risk}_{it}=\beta_0+\beta_1 QR_{it}+\beta_2 MTB_{it}+\beta_3 MEAR_{it}+\beta_5 SDTR_{it}+\beta_6 LEV_{it}+\beta_7 ROA_{it}+\varepsilon_{it}$

5. RESULTS

5.1 Correlation Analysis

A correlation matrix was used to test whether high collinearity exists among the explanatory estimators. Multicollinearity refers to the high correlation between the independent variables in the multiple regression models that are caused by the lack of interdependence among the independent variables (Andren, 2007, p. 118). Hair et al. (2010, p. 191) maintained that "the presence of high correlations (0.90 and above) is the first indication of substantial collinearity." The predictive power of the explanatory variables used in the regression model diminishes if the independent variables are highly correlated.

Table 3 shows the result of Pearson correlation analysis. The correlation matrix indicates the degree of correlation and the significance level (5%) among the independent variables. *P*-values in parentheses indicate that there is a statistically significant relationship between working capital management indicators and stock price crash risk. Moreover, there is not any multicollinearity problem among the independent variables.

The result of the correlation matrix points out that among the working capital management indexes, WCR and CR are scored higher correlation with stock price crash risk of 0.43 and 0.44, respectively. However, CCC has the lowest correlation with Crash of 0.18.

5.2. Regression Analysis

The present research hypothesized the existence of a linear relationship between the independent variables and stock price crash risk. Given that the data comprise of cross-section and time-series data, panel data analysis was more efficient for

Table 2: Variables measurement

Abbreviation	Variable	Measurement
Crash	Stock price crash risk	$-[n(n-1)^{3/2}\Sigma W_{it}]/[(n-1)(n-2)(\Sigma W_{it})^{3/2}]$
CCC	Cash conversion cycle	(Account receivables period+inventory conversion period) – accounts payables period
WCR	Working capital requirements	(Current assets – current Liabilities)/total assets
QR	Quick ratio	(Current assets – quick assets)/current liabilities
CR	Current ratio	Current assets/current liabilities
ROA	Firm performance	Net profit/total assets
Lev	Financial leverage	Total debts/Total assets
MTB	To book ratio Market	Market value of the firm/Book value of the firm
STDR	Standard deviation of stock return	Monthly standard deviation of firm's stock return
MEAR	Average of stock return	Monthly average of firm's stock return

LEV: Leverage, MTB: Market to Book value ratio, ROA: Return on Assets, CCC: Cash conversion cycle, MEAR: Average rate of stock return, STDR: Standard deviation of stock returns, WCR: Working capital requirement, CR: Current ratio, QA: Quick ratio

Table 3: Correlation analysis

Probability	LEV	ROA	MTB	MEAR	STDR	CCC	WCR	CR	QR	Crash
LEV	1 -----									
ROA	0.518 (0.000)	1 -----								
MTB	0.359 (0.00)	0.563 (0.000)	1 ----							
MEAR	0.183 (0.000)	0.048 (0.275)	0.187 (0.000)	1 ----						
STDR	0.685 (0.000)	0.414 (0.000)	0.711 (0.000)	0.594 (0.001)	1 ----					
CCC	0.518 (0.035)	0.512 (0.000)	0.648 (0.000)	0.195 (0.000)	0.574 (0.037)	1 ----				
WCR	0.453 (0.012)	0.562 (0.000)	0.596 (0.003)	0.185 (0.000)	0.606 (0.036)	0.541 (0.067)	1 ----			
CR	0.46 (0.002)	0.557 (0.000)	0.698 (0.044)	0.191 (0.000)	0.514 (0.049)	0.351 (0.127)	0.331 (0.088)	1 ----		
QR	0.553 (0.000)	0.563 (0.000)	0.397 (0.011)	0.184 (0.000)	0.406 (0.035)	0.442 (0.000)	0.544 (0.000)	0.291 (0.110)	1 ----	
Crash	0.612 (0.000)	0.477 (0.000)	0.64 (0.000)	−0.024 (0.584)	0.49 (0.000)	0.189 (0.03)	0.437 (0.000)	0.441 (0.002)	0.337 (0.00)	1 ----

Lev: Leverage, MTB: Market to Book value ratio, ROA: Return on Assets, CCC: Cash conversion cycle, MEAR: Average rate of stock return, STDR: Standard deviation of stock returns, WCR: Working capital requirement, CR: Current Ratio, QA: Quick Ratio

data analysis. For panel data analysis, a researcher can choose between pooled estimation and panel estimation with fixed or random effects. The first stage of the panel data analysis includes testing whether the data are poolable. Subsequently, if the poolability of the data is rejected, the choice is between the fixed effect and the random effect estimations (REM). Husaman test is applied to the choice between the fixed effect estimation (FEM) and REM.

Chow test (redundant fixed effect) was selected to test the poolability of the data, and Hausman test was applied to choose between FEM and REM, as recommended by Baltagi (2008). Table 4 lists the results of the Chow test and Hausman test. According to the above-mentioned procedures, the panel data analysis with FEM has been used to investigate the relationship between stock price crash risk and working capital management.

Table 5 shows the results of the first model that regress CCC and control variables against stock price crash risk (Crash) as a dependent variable. The result of regression analysis shows a significant negative relationship existed between *CCC* and Crash at the significance level of 1%. This negative relationship indicates that the risk of stock price crash will decrease when the companies increase the level of investment in working capital. In other words, as the firms increase the amount of working capital of the current year, the risk of stock price crash will decrease during the next year. The coefficient of control variables shows that stock price crash risk will decrease through increasing the firms' profitability (ROA) and market value (MTB). However, rising corporate debt (LEV) may increase the risk of stock prices crash.

Table 6 shows the results of the second model that regress WCR and control variables against stock price crash risk (Crash) as a dependent variable. The results indicate a significant negative relationship existed between WCR and Crash at the significance level of 1%. This negative relationship shows that the risk of stock price crash will decrease when the companies increase the level of investment in WCR. That is, companies can reduce the stock price crash risk of the current year through rising the amount of WCR of the previous year.

Table 7 shows the results of the third model that regresses CR and control variables against stock price crash risk (Crash) as a dependent variable. The results indicate that a significant negative relationship existed between CR and Crash at the significance level of 1%. This negative relationship appoints that managers can decrease the probability of stock price crash risk through increasing the level of investment in

Table 4: Model specification

Models	Chow test			Hausman test		
	F-statistic	*P*-value	Selected estimation	Statistic	*P*-value	Selected estimation
Model 1	3.125	0	Panel	19.326	0.001	Fixed-effect
Model 2	3.304	0	Panel	36.365	0.001	Fixed-effect
Model 3	3.165	0	Panel	34.365	0.000	Fixed-effect
Model 4	3.548	0	Panel	28.362	0.001	Fixed-effect

Table 5: Results of the first model

Variables	coefficient	Standard deviation	t statistics	*P*-value
C	6.733	1.804	3.733	0.000*
CCC (-1)	−0.011	0.002	−4.656	0.000*
MEAR (-1)	0.296	0.073	4.067	0.000*
STDR (-1)	0.284	0.055	5.201	0.000*
LEV	1.147	1.034	1.98	0.008*
ROA	−0.121	0.018	−6.731	0.000*
MTB	−0.710	0.171	−4.141	0.000*
R Squared		0.555		
Adjusted R^2		0.494		
F-statistic		3.456		
Prob (*F*-statistic)		0.000		
Durbin–watson stat		2.366		

Dependent variable: Stock price crash risk, CCC: Cash conversion cycle of year, MEAR: Average rate of stock return, STDR: Standard deviation of stock returns, LEV: Total debt to total assets ratio, ROA: Return on assets ratio, MTB: Market to book value ratio, * indicates a significance level at 1%, ** indicates a significance level at 5%

Table 6: Results of second model

Variables	coefficient	Standard deviation	t statistics	*P*-value
C	5.325	1.221	2.242	0.000
WCR (-1)	−0.041	0.012	−3.853	0.000
MEAR (-1)	−0.334	0.013	−2.022	0.000
STDR (-1)	0.587	0.019	3.302	0.000
LEV	−1.087	1.048	−1.412	0.022
ROA	0.221	0.338	7.007	0.000
MTB	0.661	0.155	4.802	0.000
R Squared		0.621		
Adjusted R^2		0.582		
F-statistic		7.812		
Prob (*F*-statistic)		0.000		
Durbin–watson stat		2.016		

Dependent variable: Stock price crash risk, WCR: Working capital requirement, MEAR: Average rate of stock return, STDR: Standard deviation of stock returns, LEV: Total debt to total assets ratio, ROA: Return on assets ratio, MTB: Market to book value ratio, *indicates a significance level at 1%, **indicates a significance level at 5%

currents assets. That is, companies can reduce the stock price crash risk of the current year through rising the amount of working capital elements of the previous year.

Finally, Table 8 shows the results of the fourth model that investigates the relationship between QR and stock price crash risk (Crash) as a dependent variable. The results indicate that a significant negative relationship existed between QR and Crash at the significance level of 1%. This negative relationship indicates that managers can decrease the probability of stock price crash risk through increasing the level of investment in quick assets such as receivables, cash, and short-term debts. That is, companies can reduce the stock price crash risk of the current year through rising the amount of liquid working capital of the previous year.

6. DISCUSSION AND CONCLUSIONS

The present study investigates the relationship between working capital strategies and stock price crash risk. The results indicate that all working capital indicators (CCC, WCR, CR, and QR) have a significantly negative relationship

Table 7: Results of the third model

Variables	Coefficient	Standard deviation	t statistics	*P*-value
C	−16.376	11.149	−1.469	0.143
CR (-1)	−0.183	12.513	−2.853	0.015
MEAR (-1)	−0.302	0.073	−4.168	0.000
STDR (-1)	0.299	0.056	5.346	0.000
LEV	−0.923	1.062	−0.869	0.006
ROA	0.131	0.013	9.756	0.000
MTB	0.822	0.178	4.624	0.000
R squared		0.554		
Adjusted R^2		0.553		
F-statistic		3.442		
Prob (*F*-statistic)		0.000		
Durbin–watson stat		2.379		

Dependent variable: Stock price crash risk, CR: Current ratio, MEAR: Average rate of stock return; STDR: Standard deviation of stock returns, LEV: Total debt to total assets ratio, ROA: Return on assets ratio, MTB: Market to book value ratio, * indicates a significance level at 1%, ** indicates a significance level at 5%

Table 8: Results of the fourth model

Dependent Variable: CRASH				
Variables	**coefficient**	**Standard deviation**	**t statistics**	***P*-value**
C	12.985	5.982	2.171	0.031
QR (-1)	−0.417	0.527	−12.168	0.000
MEAR (-1)	−0.322	0.066	−4.865	0.000
STDR (-1)	0.315	0.049	6.468	0.000
LEV	−0.541	1.124	−0.481	0.031
ROA	0.143	0.023	6.320	0.000
MTB	2.590	0.354	7.308	0.000
R Squared		0.589		
Adjusted R^2		0.541		
F-statistic		3.982		
Prob (*F*-statistic)		0.000		
Durbin–watson stat		2.172		

Dependent variable: Stock price crash risk, QR: Quick ratio, MEAR: Average rate of stock return, STDR: Standard deviation of stock returns, LEV: Total debt to total assets ratio, ROA: Return on assets ratio, MTB: Market to book value ratio, *indicates a significance level at 1%, **indicates a significance level at 5%

with stock price crash risk. That is, managers decrease the stock price crash risk through working capital strategies. Stock price crash risk refers to the management tendency to retain bad news about the company. If managers are able to hide bad news for a long time, the distribution of stock returns could be asymmetric. The asymmetry information between managers and firms' outsiders such as stockholders may create a situation where managers use working capital strategies to decrease the stock price crash risk. Stock price crash risk may endanger the survival of the company, and ultimately threaten the position of managers. Therefore, managers have strong incentives to increase their power over firms by enhancing the probability of the corporations' survival and reducing the risk in business operations. The manager's control on working capital strategies may be a good channel to pursue their benefits and incentives. These incentives could encourage managers to increase the level of the firm's working capital investment that decreases the firms' stock price risk. The reduction of stock price crash risk will be temporary and short-time horizon since managers will not be able to hide bad news for a long time. However, there is a limit to managers in terms of bad news that they can absorb and hide successfully. This restriction is due to the fact that if at one particular time the amount of bad news collected has reached a certain threshold or a certain limit, then continuing to hide them is either very costly or impossible in general. When the bad news comes to the last point, all of them are suddenly published, leading to negative upsurge of stock returns that the market has adapted to, and this is the same price collapse.

The results indicate a negative relationship between working capital indicators and stock price crash risk. That is, managers use working capital strategies to decrease the risk of stock price crash risk. The results are in line with those of Pouraghajan et al. (2015) which show that managers

manipulate working capital strategies to decrease the risk of a stock price crash. In addition, the results are consistent with those of Audrey and Grace (2019) suggested that information asymmetric would be a channel for concealing information that mitigates stock price crash risk.

The limitations of the study are those characteristics of methodology that influence the interpretation of the research findings. The present study was conducted using data from 103 companies listed in the TSE. Investment, leasing, and insurance companies have been excluded from the sample due to their specific nature. This may influence the external validity or the result of unanticipated challenges that emerged during the study.

Future studies can investigate the relationship between working capital management and stock price crash to find the threshold of working capital strategies that affect stock price crash risk.

REFERENCES

Andren, T. (2007). *Econometrics.* United Kingdom: Thomas Andren and Ventus Publishing Aps.

Arachchi, A., Perera, W., & Vijayakumaran, R. (2017). The impact of working capital management on firm value: Evidence from a frontier market. *Asian Journal of Finance and Accounting*, 9(2), 399-413.

Audrey, W. H., & Grace, H. W. (2019). The fair value of investment property and stock price crash risk. *Asia-Pacific Journal of Accounting and Economics*, 26(1-2), 38-63.

Baltagi, B. H. (2008). *Econometric Analysis of Panel Data*. Chichester: John Wiley and Sons Ltd.

Bandara, R. (2015). Impact of working capital management policy on market value addition. *Global Journal of Contemporary Research in Accounting, Auditing and Business Ethics*, 1(2), 354-373.

Callen, J. L., & Fang, X. (2015). Religion and stock price crash risk. *Journal of Financial and Quantitative Analysis*, 50(1 and 2), 169-195.

Chiou, J. R., & Cheng, L. (2006). The determinants of working capital management. *Journal of American Academy of Business*, 10(1), 149-155.

Faulkender, M., & Wang, R. (2006). Corporate financial policy and the value of cash. *Journal of Finance,* (61), 1957-1997.

Filbeck, G., Krueger, T., & Preece, D. (2007). CFO magazine's working capital survey: Do selected firms work for shareholders? *Quarterly Journal of Business and Economics,* 46(2), 3-22.

Habib, A., & Hasan, M. (2016). Auditor-provided tax services and stock price crash risk. *Accounting and Business Research*, 46(1), 51-82.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis.* 7th ed. Upper Saddle River, New Jersey: Prentice Hall.

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*, 94, 67-86.

Kothari, S. P., Shu, S., & Wysocki, P. D. (2009). Do managers withhold bad news? *Journal of Accounting Research*, 47, 241-276.

Mansoori, E., & Muhammad, J. (2012). Determinants of working capital management: Case of Singapore firms. *Research Journal of Finance and Accounting*, 3(11), 15-23.

Mansoori, E., & Muhammad, J. (2012). The effect of working capital management on firm's profitability: Evidence from Singapore. *Interdisciplinary Journal of Contemporary Research in Business*, 4(5), 472-486.

Moghaddamnia, M., & Mansoori, E. (2016). Relationship between financial constraints, economic crises and working capital management of companies listed on Tehran stock exchange. *International Business Management,* 10(15), 3141-3145.

Myers, S. C., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187-221.

Perera, W., & Priyashantha, P. (2018). The impact of working capital management on shareholders' wealth and profitability: Evidence from Colombo stock exchange. *Investment Management and Financial Innovations,* 15(2), 104-115.

Pouraghajan, A., Taghipouryan, Y., & Bavandi, S. (2015). Effect of working capital strategies on stock price changes and cash value added of companies listed in Tehran stock exchange. *Applied Mathematics in Engineering, Management and Technology*, 15(1), 762-770.

Rostami, R., & Mansooi, E. (2017). Evaluate the relationship between risk management and working capital management in companies accepted in Tehran stock exchange. *International Journal of Environmental and Science Education*, 12(2), 291-301.

Stulz, R. (2005). The limits of financial globalization. *The Journal of Finance,* 60(4), 1595-1638.