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Working capital management and profitability: Comparison study of One Belt One Road

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ABSTRACT: Working Capital Management is an important concept when it occurs in firms' profitability. In this paper, the impacts of Working Capital Management on firms' profitability are investigated with the scope of Chinese Listed Transportation Equipment Companies before and after the OBOR policy. To do the research, secondary data are used to do regression and correlation analysis. WCM is represented by the current ratio, quick ratio, inventory turnover ratio, cash conversion cycle, firm size, and financial debt ratio, while profitability measures are return on assets and return on equity. Findings show that CR, ITR, CCC, and FS have negative impacts on profitability, while QR and FDR have positive impacts on profitability. With the findings, management can make better decisions to maximize profitability by properly lowering CR, ITR, CCC, and FS, or increasing QR and FDR.

Keywords: *Working Capital Management, Profitability, OBOR policy, Transportation Equipment Industry.*

Data Availability: *The data is extracted from CSMAR database. Sample is selected based on the information provided by SSE and SZSE).*

INTRODUCTION

Working capital is an accounting term calculated by current assets minus current liabilities. It can measure a firm's liquidity as well as its capability of covering short-term debts. Working capital management is the management of a firm's working capital, and it is an important aspect that managers need to pay attention to so that they can adjust the firm's daily operations to create more values (Vahid et al., 2012). Working capital management (WCM) becomes a necessary business strategy made by almost all companies to ensure there is a relative balance between their current assets and short-term obligations. Also, it plays a vital part in any company because of its double-edge arrow features. Under different situations, current assets may impact a firm's profitability oppositely. Too many current assets may influence the investment activities, while inadequate current assets may influence the firm's liquidity, thereby hampering its normal performance (Van Horne & Wachowicz, 2004). Likewise, current liability also should be kept within a proper range. Thus, WCM is needed for decision-makers to assist their wiser management of the company.

China, as a highly growing country, put up a policy called "One Belt One Road (OBOR)" in 2013, which was aimed to facilitate global financial communications (according to OBOR official

website and formal files). OBOR consists of “One Belt” named “The Silk Road Economic Belt” and “One Road” called “the 21st-century Maritime Silk Road”. This policy has five main purposes, respectively coordinating policies; connecting facilities; free trading; financial integration; and bonding among different cultures and people (Tsui et al., 2017). OBOR brings a lot of financial activities for domestic companies and arises their diverse responses from different industries, such as the construction and engineering field, power engineering area, and transportation equipment industry. However, since OBOR is a brand-new concept appearing in this decade, there are few pieces of literature relating to this scope.

According to the study conducted by ZHANG and CHEN (2011), the transportation equipment industry is a dominant part of the national economy, and the performance of it is an important index using to measure the overall industrial level of a nation. Many relevant papers regarding the impacts of WCM on profitability are available and accessible to almost all readers. However, existing papers talking about relationships between these two items regarding the transportation equipment industry after 2013 are still in a shortage.

Therefore, holding the minds of investigating and making up this knowledge gap to some extent, I mainly focus on investigating the transportation equipment industry before and after the OBOR policy in this paper, then comparing the results of two different time periods in order to find any changes that have occurred.

Based on existing evidence, working capital management varies among different industries. Akoto, Awunyo-Vitor, and Angmor (2013) investigated the relationships between working capital management and profitability of 13 Ghanaian listed manufacturing firms. Their findings showed the indicator of the Cash Conversion Cycle (CCC) has a positive influence on these chosen firms’ profitability, which was just contrast to another paper written by sCanDinaVian COuntriEs (2017), drawing the conclusion that there is a negative relationship between CCC and profitability. Thus, there is some adequate evidence to support that the same measures used in the case of transportation equipment companies may or may not lead to a common result. To get an accurate conclusion, more things will be detailed in the following content.

To make the results and findings more reasonable and convinced, a specified criterion was set to choose the sample from the whole companies listed on SSE or SZSE, and secondary data from CSMAR were used to do regression and correlation analysis. At the same time, some common parameters and indicators which had usually been mentioned in similar papers were applied in this paper to fulfill the main aim- investigating the relationships between WCM and profitability of the transportation equipment companies before and after the OBOR policy. The whole paper goes around two research questions, that are ‘Does WCM impact transportation equipment firm’s profitability?’ and ‘Is there any difference between the results shown in the analysis of before, and after the OBOR policy?’. The findings show that WCM has a significant impact on profitability by different measures, especially in CR, QR, ITR, CCC, and FS.

The findings mainly contribute to the existing papers from two aspects. On one hand, OBOR is a new area for China that needs to be explored more, as it involves a bunch of capital inputs and effective outputs in multiple ways. However, in fact, relevant researches regarding this topic are not enough, thus, this study can be viewed as an attempt to make some differences and encourage more following studies by others who may be interested in it. On the other hand, the findings and results of this study suggest that company managers can try to maximize the profits as many as possible without bringing more risks for firms by adjust related financial ratios or financial index, such as properly increasing quick ratio or shortening cash conversion cycle.

This remainder content of this study is divided into several parts. In the next part, the existing literature will be presented, and the main hypotheses will be established. The research methodology used will be introduced in part 3 and then the corresponding findings and results of the analysis are going to be shown in the following section. In part 5, further discussions and details will be given and in the last part, an overall conclusion will be provided as well as reveals of research limitations.

LITERATURE BACKGROUND AND HYPOTHESIS DEVELOPMENT

OBOR Policy in China

One Belt One Road policy is also called the “Belt and Road Initiative”. It was released in 2013 by the Chinese government and aimed to promote the connections and communications among Asian, Europe, and Africa (Hong, 2016). This policy pays a lot of attention to “going out” and “opening doors” strategies. It facilitates the integration of economics and finance for those countries that are connected in different ways, such as waterways and roads (Sarker et al., 2018). OBOR consists of many different actions of China, the most concerned part is the infrastructure developments. The Chinese government puts many capitals and efforts into improving this aspect with the support of other economic parties like AIIB, and it is viewed as a tool to improve domestic economic developments (Du and Zhang, 2018).

Working Capital Management

Working Capital is a short-term trade capital of a company to meet its financial needs in the short-run (Padachi, 2006). It is a measure of the liquidity of a company. The proper amount of working capital can benefit a firm’s profitability. However, too much will be less. Based on the findings of Bhattacharya (2001), too much liquidity will be harmful to a company’s profitability as it limits the investments in PP&E (Property, Plant & Equipment). Therefore, proper and wise management of working capital is required by those companies who want to operate smoothly and successfully.

Additionally, working capital management contributes to the risk analysis and profitability analysis of a company, thereby determining the value of it (Baños-Caballero et al., 2010). The optimal purpose of it is to balance each part of working capitals for firms by reducing or increasing some of them (Filbeck and Krueger2005). Work capital management with high efficiency can improve a company’s performance by increasing its free cash flows, thereby increasing the returns created to shareholders and the company itself (Ganesan, 2007).

Profitability

Profitability is a term used to measure the capability to earn profits of a company. Other than the gross margin and operating profits, there are some other representatives, or said indicators, to represent it. ROA and ROE are the most common ones utilized by many studies (e.g. the study investigating the factors influencing profitability by San and Heng in 2013), as the two both can reflect net profits.

Relationship between Working Capital and Profitability

The exact importance of working capital management is detailed in the literature. Shahzad, Fareed, and Zulfiqar (2015) utilized Return on Assets as the measure of a firm’s profitability and found a positive impact of Current Ratio, Net Current Assets over Total Assets and Inventory turnover Ratio on the firm’s profitability (by ROA), as well as a negative relationship between Quick Ratio or Working Capital Turnover Ratio and profitability. However, based on the paper of

Eljelly et al. (2004), the current ratio has a negative impact on a firm's profitability by using the measure of ROA.

Hsieh and Wu (2013) utilized Operating Income as a measurement indicator to discuss gross profitability in their paper and found a negative correlation respectively between Accounts Receivable Collection Period, Inventory Turnover Period, or Cash Conversion Cycle and gross profitability. This finding has many overlaps with the analysis of SME's profitability in Spain by Garcia-Teruel and Martinez-Solano (2007), which stated reducing inventory, decreasing accounts collection days and shortening Cash Conversion Cycle could increase a firm's profitability.

Gill, Biger, and Mathur (2010) applied CCC, FD (Financial Debt Ratio), LnS (Firm size, calculated by Natural logarithm of firm's sales) and some other common working capital ratios as independent variables, utilized Gross Operating Profit as dependent variable to investigate the impacts of WCM on the profitability of 88 American firms listed on NYSE from year 2005 to 2007. Their analysis showed a positive relationship between CCC, LnS and profitability as well as a negative relationship between profitability and FD. While in the paper studied by Eda, & Mehmet (2009), ROA was utilized as the dependent variable which represented for profitability and CCC was also applied as one independent variable. The relationship analyzed in this study showed a negative pattern between profitability and CCC. Thus, with different indicators, the results may be a little bit different.

According to this contradiction, there are enough reasons to get the inference that the relationships between the same WCM ratios and the firm's profitability may vary among different companies. Thus, it is necessary to investigate the specific industries one by one.

In China, there are many different industries, including manufacturing, service, engineering, etc. After the releasing of "One Belt One Road", these industries actively respond to it, especially those industries like construction, transportation, electricity, and engineering (One Belt One Road website). Although a bunch of powerful papers investigating the relationships between WCM and profitability has been already presented in the world, there are still some omissions and shortages in the aspect of the specific industries after the releasing of the OBOR policy. Therefore, this study is conducted to make up a small portion of this knowledge gap by analyzing the transportation equipment industry.

There are a lot of studies showing that WCM will influence a company's profitability either significantly or insignificantly as well as either positively or negatively. Based on the literature of Agha (2014), working capital management affects companies' profitability significantly. According to the researches of Chatterjee (2010) and Muhammad et al. (2016), there is a significant negative relationship between WCM and firms' profitability by using ROA as the measure of profitability. However, based on the results coming from the study of Kaddumi et al. (2012), the relationship between WCM and companies' performance should be positive. From this, it suggests that the exact relationships between WCM and profitability may vary in different situations and need to be investigated with some specified criteria. Referring to the existing researches, we set the hypothesis of our study in the null form:

H₀: there is no significant relationship between WCM and a company's profitability;

H₁: there are significant relationships between WCM and a company's profitability.

RESEARCH METHODOLOGY

Data Source and Sample Selection

The sample selected in this paper was chosen based on the criteria that whether to have their

Regression Models

Although many literatures investigated the same topic, they could apply different parameters as their independent or dependent variables. For independent variables, the most common ones are firm size, liquidity ratios (Doğan, 2013), current ratio (Arunkumar, 2013), financial debt, cash conversion cycle, firm size (Gill et al., 2010), and quick ratio (Fareed & Zulfikar, 2015). As for dependent variables, return on assets and return on equity are two representative parameters in plenty of papers.

With the framework and these variables commonly mentioned in the relevant literatures, two models of different profitability measures can be established as the equations:

$$ROA = \alpha_0 + \alpha_1 CR + \alpha_2 QR + \alpha_3 ITR + \alpha_4 CCC + \alpha_5 FS + \alpha_6 FDR + \mu (1)$$

$$ROE = \beta_0 + \beta_1 CR + \beta_2 QR + \beta_3 ITR + \beta_4 CCC + \beta_5 FS + \beta_6 FDR + \mu (2)$$

Where, α_1 to α_6 and β_1 to β_6 all represent the corresponding coefficient of each variable in the regressions. α_0 and β_0 are the intercepts. μ is the error term. Some other brief descriptions of variables are provided in the table below:

TABLE 1
Brief Descriptions of Variables Investigated in This Study

Variables	Measurement Formula	Source
ROA	Net profit before taxes/ Total Assets	CSMAR
ROE	Net profit before taxes/ Shareholder's Equity	CSMAR
CR	Current Assets/ Current Liabilities	CSMAR
QR	Quick Assets/ Current Liabilities	CSMAR
ITR	Cost of Goods Sold/ Average Inventory	CSMAR
CCC	Accounts Receivable Collection Period + Inventory Turnover Period – Accounts Payable Payment Period	CSMAR
FS	Natural Logarithm of Sales (LnS)	CSMAR
FDR	(Short-Term Loans + Long-Term Loans)/ Total Assets	CSMAR

RESULTS AND FINDINGS

Results Analysis for the Pre-OBOR Data

Descriptive Statistics

Table 2 shows the summary of descriptive statistics of the data from 2009 to 2013, namely the 5-year period before the OBOR policy was released in 2013. There are totally 86 observation objects. Means, maximum values, minimum values and standard deviations are listed, but the first three parameters are more important.

According to the table, the means of ROA and ROE are 0.030 and 0.103, while the means of independent variables, namely CR, QR, ITR, CCC, FS, and FDR are respectively 1.849, 1.453, 4.677, 88.253, 22.883 and 0.369. Besides, ROA has a maximum value of 0.064 and a minimum value of -0.012; ROE has a maximum value of 0.274 and a minimum value of -0.029. At the same time, the maximum values of CR, QR, ITR, CCC, FS and FDR are separately 7.823, 7.123, 9.967, 363.083, 25.100, and 0.653, while their minimum values are 1.083, 0.537, 1.464, -13.926, 18.062, and 0.022.

TABLE 2
Descriptive Statistics of Pre-OBOR Data

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	86	.030	.017	-.012	.064
ROE	86	.103	.068	-.029	.274
CR	86	1.849	1.251	1.083	7.823
QR	86	1.453	1.196	.537	7.123
ITR	86	4.677	1.831	1.464	9.967
CCC	86	88.253	76.329	-13.926	363.083
FS	86	22.883	1.621	18.062	25.100
FDR	86	.369	.148	.022	.653

Correlation Analysis

The matrix of correlations is shown in Table 3, in which the correlations between ROA and independent variables as well as ROE and independent variables are clearly presented.

Based on Table 3, the coefficients of CCC, FS, and FDR are respectively -0.116, -0.158, and -0.126, which means there are negative impacts of CCC, FS and FDR on ROA. Meanwhile, CR, QR, and ITR all have positive coefficients of ROA, respectively 0.079, 0.098, and 0.385, which means they positively influence ROA.

Additionally, with the same table, CR, QR, CCC, and FDR are shown to have negative coefficients as -0.424, -0.408, -0.315, and -0.033, which means the four variables have negative impacts on ROE. Meanwhile, the coefficients of ITR and FS are 0.203 and 0.439, which means they both positively impact ROE.

TABLE 3
Pre-OBOR Correlations Matrix

Variables	(ROA)	(ROE)	(CR)	(QR)	(ITR)	(CCC)	(FS)	(FDR)
ROA	1.000							
ROE	0.605***	1.000						
CR	0.079	-0.424***	1.000					
QR	0.098	-0.408***	0.992***	1.000				
ITR	0.385***	0.203*	0.024	0.081	1.000			
CCC	-0.116	-0.315***	0.699***	0.682***	-0.557***	1.000		
FS	-0.158	0.439***	-0.768***	-0.726***	-0.020	-0.445***	1.000	
FDR	-0.126	-0.033	-0.493***	-0.435***	0.114	-0.416***	0.456***	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Regression Analysis

Table 4 and Table 5 respectively show the regression analysis results of all six independent variables and ROA/ ROE.

In table 4, ROA is the dependent variable. Based on the results, the regression coefficients of CR, FS, and FDR are shown as -0.023, -0.004, and -0.026, Meanwhile, the coefficients of QR and ITR are shown to be 0.017 and 0.005. As for the “0.000” value of CCC, after further calculations, it should be around -0.000026. Table 4 also shows the P-value of ITR is 0.018 and marked by two stars, which reflects that there is strong significance between ITR and ROA with the significance level of 0.05. And so forth, the P-value of FS is 0.050 and marked by one star, which means there is a weak significance between FS and ROA with the significance level of 0.1. P-values of CR, QR, FDR, and CCC are 0.226, 0.399, 0.122, and 0.244, which cannot support any significance between the four variables and ROA. Additionally, the R^2 is shown in the table as well and it is equal to 0.230, which is not enough to prove the regression model has a goodness-of-fit in this case.

The regression analysis results of using ROE as the profitability measure are shown in Table 5, in which the regression coefficients of ITR and FS are respectively 0.019 and 0.011. Meanwhile the coefficients of CR, QR and FDR are shown as -0.038, -0.003 and -0.178. As for CCC, with further investigation, it should -0.000280. Additionally, Table 5 shows the P-values of ITR and FDR are 0.008 and 0.002, and marked by three stars, which generally indicates there is a strong significance between ITR and ROE as well as between FDR and ROE with the significance level of 0.01. At the same time, the P-value of CCC is 0.062, which normally indicates a weak significance between CCC and ROE with the significance level of 0.1. Besides, the P-value of CR, QR, and FS, are 0.565, 0.968, and 0.115, which cannot indicate any significance between them and ROE. In addition, the value of R^2 is shown as 0.406, which normally indicates the regression model has a goodness-of-fit in this case.

TABLE 4
Pre-OBOR Linear regression of ROA

	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-0.023	0.019	-1.220	0.226	-0.062	0.015	
QR	0.017	0.020	0.850	0.399	-0.022	0.056	
ITR	0.005	0.002	2.420	0.018	0.001	0.009	**
CCC	0.000	0.000	1.170	0.244	0.000	0.000	
FS	-0.004	0.002	-1.990	0.050	-0.008	0.000	*
FDR	-0.026	0.016	-1.560	0.122	-0.058	0.007	
Constant	0.118	0.056	2.110	0.038	0.007	0.230	
Mean dependent var		0.030		SD dependent var		0.017	
R-squared		0.230		Number of obs		86.000	
F-test		3.939		Prob > F		0.002	
Akaike crit. (AIC)		-461.838		Bayesian crit. (BIC)		-444.658	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE 5
Pre-OBOR Linear regression of ROE

	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-0.038	0.066	-0.580	0.565	-0.169	0.093	
QR	-0.003	0.067	-0.040	0.968	-0.137	0.131	
ITR	0.019	0.007	2.730	0.008	0.005	0.034	***
CCC	0.000	0.000	1.890	0.062	0.000	0.001	*
FS	0.011	0.007	1.590	0.115	-0.003	0.024	
FDR	-0.178	0.056	-3.170	0.002	-0.290	-0.066	***
Constant	-0.129	0.192	-0.670	0.503	-0.511	0.252	

Mean dependent var	0.103	SD dependent var	0.068
R-squared	0.406	Number of obs	86.000
F-test	8.982	Prob > F	0.000
Akaike crit. (AIC)	-250.256	Bayesian crit. (BIC)	-233.075

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Results Analysis for the Post-OBOR Data

Descriptive Statistics

Like Table 2, the descriptive statistics table of Pre-OBOR data, Table 6 shows the summary of descriptive statistics of Post-OBOR data, and there are totally 140 observation objects. Compared to the 5-year data before, there are more records because there are some data missing for the former 5 years.

According to the table, the means of ROA and ROE are 0.023 and 0.041, while the means of CR, QR, ITR, CCC, FS, and FDR are respectively 2.386, 1.821, 37.821, 169.496, 22.030 and 4.430. Besides, ROA has a maximum value of 0.120 and a minimum value of -0.155; ROE has a maximum value of 0.204 and a minimum value of -0.263. At the same time, the maximum values of CR, QR, ITR, CCC, FS and FDR are separately 8.987, 7.901, 465.101, 417.544, 24.993, and 43.083, while their minimum values are 1.093, 0.723, 0.678, 45.335, 17.978, and 0.018.

TABLE 6
Descriptive Statistics of Post-OBOR Data

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	140	.023	.043	-.155	.120
ROE	140	.041	.081	-.263	.204
CR	140	2.386	1.557	1.093	8.987
QR	140	1.821	1.369	.723	7.901
ITR	140	37.821	94.004	.678	465.101
CCC	140	169.496	91.389	45.335	417.544
FS	140	22.030	1.905	17.978	24.993
FDR	140	4.430	10.343	.018	43.083

Correlation Analysis

Table 7 shows the correlations matrix of the data after OBOR, from which, the coefficients of ITR, FS, and FDR are respectively -0.469, -0.481, and -0.435, meaning there are some negative impacts of the three variables on ROA. Meanwhile, CR, QR, and CCC have positive coefficients of ROA, respectively 0.471, 0.509, and 0.205, which means they positively influence ROA.

Additionally, with the same table, ITR, CCC, FS, and FDR are shown to have negative coefficients as -0.591, -0.019, -0.173, and -0.529, which means the four variables have negative impacts on ROE. Meanwhile, the coefficients of CR and QR are 0.131 and 0.177, which means they both positively impact ROE.

TABLE 7
Post-OBOR Correlations Matrix

Variables	(ROA)	(ROE)	(CR)	(QR)	(ITR)	(CCC)	(FS)	(FDR)
ROA	1.000							
ROE	0.849***	1.000						
CR	0.471***	0.131	1.000					
QR	0.509***	0.177**	0.992***	1.000				
ITR	-0.469***	-0.591***	-0.123	-0.169**	1.000			
CCC	0.205**	-0.019	0.331***	0.334***	-0.289***	1.000		
FS	-0.481***	-0.173**	-0.727***	-0.722***	0.213**	-0.582***	1.000	
FDR	-0.435***	-0.529***	-0.162*	-0.202**	0.939***	-0.332***	0.245***	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Regression Analysis

Table 8 shows the regression analysis results of independent variables and ROA, while Table 9 shows the results of independent variables and ROE.

Based on table 8, the regression coefficients of CR and FS are shown as -0.034 and -0.007. Meanwhile, the coefficients of QR and FDR are shown to be 0.048 and 0.001. As for the “0.000” value of ITR and CCC, after further calculations, they should be -0.000191 and -0.000036. Table 8 also shows the P-value of QR and FS are both 0.004 and marked by three stars, which means there is a very strong significance between FS and ROA as well as between QR and ROA with the significance level of 0.01. And so forth, the P-value of CR, ITR, and CCC are 0.020, 0.012, and 0.041 and marked by two stars, which reflects there is a strong significance separately between CCC, ITR, CR and ROA with the significance level of 0.05. Besides, the table also shows the P-value of FDR is 0.450, which is not powerful enough to indicate any significance between FDR and ROA at all. In addition to coefficients and P-value, the R-squared value also shows in the table and it is equal to 0.467, which can be roughly concluded from that the regression model has a goodness-of-fit in this case.

TABLE 8
Post-OBOR Linear Regression of ROA

	Coef.	St. Err.	t-value	p-value	[95% Conf Interval]	Sig
CR	-0.034	0.015	-2.360	0.020	-0.063 -0.006	**
QR	0.048	0.016	2.890	0.004	0.015 0.080	***
ITR	0.000	0.000	-2.540	0.012	0.000 0.000	**
CCC	0.000	0.000	-2.060	0.041	0.000 0.000	**

FS	-0.007	0.002	-2.960	0.004	-0.012	-0.002	***
FDR	0.001	0.001	0.760	0.450	-0.001	0.002	
Constant	0.197	0.062	3.180	0.002	0.074	0.319	

Mean dependent var	0.023	SD dependent var	0.043
R-squared	0.467	Number of obs	140.000
F-test	19.455	Prob > F	0.000
Akaike crit. (AIC)	-560.931	Bayesian crit. (BIC)	-540.339

The coefficients of CCC (cash conversion cycle) and ITR (inventory turnover ratio) should respectively be around -0.000036, -0.000191.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9 generates analysis results of the ROE regression model, based on which, the regression coefficients of CR, ITR, and FS are respectively -0.067, -0.001, and -0.011. Meanwhile, the coefficients of QR and FDR are positive and shown as 0.076 and 0.001. As for CCC, it has a value of 0.000. By further investigation, it was found to be around -0.000217. The P-value of FS, QR, and CR, QR, and FS are respectively 0.018, 0.017, and 0.024 and marked by two stars, which generally indicates there is a strong significance between them and ROE with the significance level of 0.05. At the same time, the P-value of ITR and CCC are nearly 0.001 and 0.000, and marked by three stars, which normally indicates a strong significance between CCC and ROE as well as between ITR and ROE with the significance level of 0.01. The P-value of FDR is 0.558, which cannot show any significance. R^2 value in this table is 0.452, which means this model also has a goodness-of-fit.

TABLE 9
Post-OBOR Linear Regression of ROE

	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-0.067	0.028	-2.390	0.018	-0.122	-0.012	**
QR	0.076	0.032	2.420	0.017	0.014	0.139	**
ITR	-0.001	0.000	-3.540	0.001	-0.001	0.000	***
CCC	0.000	0.000	-4.000	0.000	0.000	0.000	***
FS	-0.011	0.005	-2.280	0.024	-0.020	-0.001	**
FDR	0.001	0.001	0.590	0.558	-0.002	0.004	
Constant	0.364	0.119	3.070	0.003	0.130	0.599	

Mean dependent var	0.041	SD dependent var	0.081
R-squared	0.452	Number of obs	140.000
F-test	18.279	Prob > F	0.000
Akaike crit. (AIC)	-378.339	Bayesian crit. (BIC)	-357.748

The coefficient of CCC (cash conversion cycle) should be around -0.000217.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

DISCUSSION

All these results presented in the above tables show that WCM has a weak significant impact on a firm's profitability in the Pre-OBOR 5 years, while it has a significant impact on profitability in the Post-OBOR 5 years, except the financial debt ratio. The results reject H_0 , and support H_1 generally, that is "there are significant relationships between WCM and a company's profitability".

The purpose of this research is to do a comparative study, but the findings of the Post-OBOR situations will be more beneficial and meaningful to those transportation equipment companies nowadays, as the big environment and financial landscape of China have not changed too much within the recent 5 years compared to that back to 2009. As for the Pre-OBOR analysis, the results could only be a compared object because too many data are missing when we did our study, and the available data are out-of-date.

Based on the regression results, it is indicated that the relationships between CR, ITR, CCC, FS and profitability (measured by ROA or ROE) are negative, which means higher sales, cash conversion days (by longer collection days of accounts receivables and inventory turnover, shorter payment days of accounts payables), inventory turnover periods, and current assets will lead to lower profitability. Meanwhile, the relationships between QR, FDR and profitability are positive, which means higher financial debts and quick assets will cause profitability to increase.

With these findings, companies with the same features involving in this scope can adjust their operations and change relevant ratios reasonably to maximize their profitability, such as decreasing their current ratio; inventory turnover ratio; cash conversion cycle; or firm size by properly reducing current assets; adding more inventories; or extending payment days of accounts payables. Also, they can increase quick ratio and financial debt ratio by keeping a little bit more quick assets like marketable securities and getting more loans to improve their performance.

Unexpected Results and Explanations

With Table 10, we can see that for Chinese listed transportation equipment companies involving in the OBOR policy, when we use ROA to represent profitability, the statistical results of the relationships between WCM and profitability is different from using ROE as the measure. In the Pre-OBOR analysis, it shows when ROA was used to measure profitability, the correlations between profitability and CR, QR, ITR are positive, while between profitability and the rest three are negative. However, in the analysis of ROE, the correlations between CR, QR, or CCC and profitability are opposite from what they perform in ROA. In Post-OBOR analysis, the difference is much smaller and only happens in FDR, but it also means something.

Table 11 sums up the regression results conducted in this study, from which we can see that Pre-OBOR, when ROA was used to measure profitability, there is an insignificant negative relationship between CR, CCC, FDR and profitability as well as a significant negative relationship between FS and profitability, which means company can increase their profitability by slightly decreasing firm size. Also, it indicated that there is an insignificant positive relationship between QR and profitability as well as a significant positive relationship between ITR and profitability, which suggests that the company can improve its performance by properly increasing its inventory turnover. When ROE was used, differences occur in the aspects of QR, CCC, FS, and FDR.

Regarding these discrepancies between ROA and ROE, we put up two possible guesses. First, we think it is maybe caused by the features of the firms. Deloof (2003) pointed out that for those firms with a bigger proportion of financial assets on their balance sheets and getting little impacts from operating activities on their overall ROA. ROA is not a proper indicator. Thus, sometimes, ROA cannot tell all true things. Second, ROA and ROE are calculated in different

ways (see Table 1), ROA is calculated based on total assets, while ROE is calculated based on shareholder's equity. Thus, it may be another reason to cause differences.

In addition to the differences between ROA and ROE, other main discrepancies occur between the Pre-OBOR and Post-OBOR analysis.

Table 10 shows the correlations between each independent variable and ROA or ROE after OBOR policy are different from that before OBOR policy to some extent, especially about the variable of ITR, which is totally opposite no matter which profitability measure is used. Table 11 shows even larger differences regarding both the positive or negative relationships and the insignificance and significance.

For these unexpected results, they are inferred to be caused by the changes in companies' capital structure and present tax regulations. For the first guess, the OBOR policy aims to develop infrastructure industries, and the economic landscape of Infrastructure development is changing due to the OBOR policy (Wen & Lyu, 2019). The releasing of this policy leads to more debt loans offered by AIIB (Asian Infrastructure Investment Bank), which causes more financial debts of those companies, thereby, changing the existing capital structure (Yu, 2017). Meanwhile, the relationship between capital structure and companies' performance has already been investigated in the former literatures, which shows the capital structure has impacts on the performance of a company (Taqi et al., 2016; Voulgaris et al., 2002). Besides, the changes happening in the tax regulations also contribute to unexpected results. With the implementation of the "One Belt and One Road" policy, the Chinese government makes modifications of present Tax regulations (Yang, 2015). However, the tax has some dominant impacts on the transportation equipment industry, especially the business tax, which will influence the main index used to measure gross profits (Wu, 2011).

TABLE 10
Summary of Correlation Results

Variables	CR	QR	ITR	CCC	FS	FDR
Pre-OBOR-ROA	+	+	+	-	-	-
Pre-OBOR-ROE	-	-	+	+	-	-
Post-OBOR-ROA	+	+	-	-	-	+
Post-OBOR-ROE	+	+	-	-	-	-

Note: "+" means positive correlation, "-" means negative correlation; "Insig." Means insignificant, "Sig." means significant.

TABLE 11
Summary of Regression Results

Variables	CR	QR	ITR	CCC	FS	FDR
Pre-OBOR-ROA	Insig. / -	Insig. / +	Sig. / +	Insig. / -	Sig. / -	Insig. / -
Pre-OBOR-ROE	Insig. / -	Insig. / -	Sig. / +	Sig. / -	Insig. / +	Sig. / -
Post-OBOR-ROA	Sig. / -	Sig. / +	Sig. / -	Sig. / -	Sig. / -	Insig. / +
Post-OBOR-ROE	Sig. / -	Sig. / +	Sig. / -	Sig. / -	Sig. / -	Insig. / +

Note: "+" means positive relationship, "-" means negative relationship; "Insig." Means insignificant, "Sig." means significant.

Research Reliability and Validity

To do this research, the same data analyzing methods as many other studies have applied before were used, such as the paper of Shahzad et al (2015), which used ROA as its profitability measure and CR and QR as part of its independent variables. In this paper, the relationships between WCM and profitability were investigated by using relevant profitability measures and WCM parameters as well, which includes the same parameters of ROA, CR, and QR. Also, the panel data regression model was established similarly to what Hsieh & Wu (2013) did in their paper. In addition, sample companies were chosen based on SSE and SZSE with a specified criterion and the data used for analysis were all from CSMAR, a professional database that is free from errors.

Moreover, the main results produced are in accordance with some existing literatures. For example, CCC in this paper showed both positive and negative impacts on profitability depending on different profitability measures used, namely ROA and ROE. This finding seemed a little bit controversial, but in fact, it had been approved by at least two previous researches respectively done by Akoto et al (2013) and sCanDinaVian COuntriEs (2017). Besides, based on the studies done by Eljelly et al. (2004); Doğan (2013); Garcia-Teruel and Martinez-Solano (2007); Hsieh and Wu (2013) & Eda, & Mehmet (2009), CR, ITR, FS, and CCC negatively impacts profitability, which agrees with the findings of this study.

Concerning the internal validity, a bunch of studies had been done by other researchers to investigate a similar topic—relationships between WCM and Profitability. The only difference made in this study was to limit the scope of company type to the transportation equipment industry and the time period to 5 years before and after the OBOR policy. As for the external validity, all listed transportation equipment companies are chosen in this study except those who came to the market after 2009 and cannot provide enough data for analysis, which means there is no any sample selection error or bias in this study.

Theoretical Contributions

This paper investigates the relationships between Working Capital Management and profitability of Chinese listed transportation equipment companies who respond to One Belt One Road policy actively after its releasing. This topic is little known to people since OBOR comes out only for around 7 years. Few papers can be found regarding it, which may cause the knowledge gap to some people or parties who are interested in it. This paper makes up a small portion of the gap and the findings may encourage others to fulfill the rest parts. Most findings of this study generated are supported by other existing works, but at the same time, there are also some differences that may be useful and provide new views for future researches.

CONCLUSION

The research questions of this study were to figure out the relationships between working capital management and firms' profitability and to compare the situations before and after the OBOR policy. To fulfill the purposes, a sample of 7 transportation equipment companies had been chosen. The sample companies selected all have A share stock listed on either SSE or SZSE. Two sets of data from CSMAR were utilized. Regression analysis and correlation analysis are applied. ROA and ROE were used as dependent variables to measure profitability, while Current Ratio, Quick Ratio, Inventory Turnover Ratio, Cash Conversion Cycle, Firm Size, and Financial Debt Ratio were used as independent variables to represent working capital management.

For the first purpose, the main findings suggest the negative relationships exist between CR,

ITR, CCC, FS and profitability while the significant relationships exist between QR, FDR and profitability for the transportation equipment companies after the OBOR policy. All these relationships are approved to be significant except for FDR. Therefore, generally, the results reject the null hypothesis but support the alternative one, which means WCM significant impact a transportation equipment firm's profitability.

As for the second research objective, the results suggest there are some discrepancies occur before and after the policy. The possible reasonings are believed to be different capital structures and tax regulations caused by the "One Belt One Road" policy as it did many financial activities that can affect relevant parties' normal operations.

However, this study is subject to some limitations which need to be considered for the following researches. The most important ones are missing data and specified industry type. The Pre-OBOR observation objects are less than Post-OBOR ones due to the inadequate data. Thus, the comparison is not that accurate in the aspect of control variables. Also, this paper investigates the transportation equipment industry. However, the literatures relating to this scope are not too many, thus, it is hard to find direct supporting evidences that have already been proved to be true. Additionally, since this case limits the industry, the results and findings may not also fit other types of companies.

Therefore, for future studies that may be conducted within the same range of OBOR policy, the researchers should try to keep the observations consistent if they do a comparative study based on timeline. Also, there are many other industries left without enough literatures, if the following researches focus on them, more indirect information should be generated in addition to the direct, as they may provide some tiny connections among some different areas, which seem to be not relevant to the investigating topics, but in fact, they are.

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