DOES WORKING CAPITAL DETERMINE FIRM PERFORMANCE? AN EMPIRICAL RESEARCH OF THE EMERGING ECONOMY

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Abstract

The primary objective of this study is to examine the impact of working capital management efficiency on the financial health/well-being of a company measured in terms of firm value in the context of a rapidly emerging economy. This study applies a multivariate ordinary least square regression analysis on industry adjusted performance variable of 1532 Indian firms listed on the National Stock Exchange (NSE) for a period of 18 years (from 1999-2017). Not all of the 1532 firms selected for this study were listed during the whole period of study. Only 610 firms were listed at the beginning and gradually more and more companies started to get listed until eventually 922 more companies got listed to the initial tally of 610 listed firms making the total number of listed companies to be 1532 by the end of the study period. A total of 19862 firm year observations correspond to listed firms and 9246 firm year observations for unlisted firms making it a total of 29108 firm year observations. The findings of this study indicate that an efficient working capital management (proxied by Cash conversion cycle and components thereof) leads to better firm performance when adjusted for industry differences. It also shows that the relationship follows a curvilinear trajectory instead of a linear one as a change in sign in the coefficient of working capital management proxy (Cash Conversion Cycle) occurs and its square term and both are manifesting itself as significant in the listed companies. This is a co-relational study investigating the association between working capital management efficiency and firm performance. The findings of this study is based in an economy that is unique in its own right. Indian corporate landscape is replete with business groups and they dominate the market in terms of asset holding and market capitalization coupled with the existence of institutional gaps and weak legal enforcement mechanisms. All of which makes the Indian corporate landscape totally different from its more developed counterparts thus rendering the results not generalizable. The relationship between these variables should be verified in other economies taking their unique characteristics into account. This study to the best of the author's knowledge is the first one to investigate the relationship between working capital management and firm performance on such a comprehensive dataset having 62 different industries in an emerging economy. The findings of the study are intended to be of use to financial managers, investors, financial management consultants, and other stakeholders.

Keywords: Working Capital Management, Board Size, Board Independence, Industry Adjusted Firm Performance, India

1. INTRODUCTION

Efficient management of working capital is an essential component of corporate decision making.

The management of working capital is fundamentally the management of current assets that the company owns and of current liabilities that it owes. Working capital further can be dissected

into components that include receivables, inventory, payables, and cash efficiently for day-to-day operations. *"The optimization of working capital balances helps minimize working capital requirements, which in turn, increase firms' free cash flow (Ganesan, 2007)"*. Inefficient working capital management, on the other hand could prove detrimental and would likely have a negative impact on shareholders' wealth. Working capital management has emerged as an upcoming area of research in recent times for good reasons. As a complementary part of its other well researched counterparts i.e. capital structure and capital budgeting which deals with long term financial decisions, working capital management, which deals with short run financial needs has largely been overlooked/held in abeyance by the academia. This is not to say that working capital management has no literature to refer to. Some important works such as that of Deloof (2003) states that working capital management has a considerable impact on profitability of firms. He found that the longer the time lag, the larger the investment in working capital. The resurgence of research would lead to many more useful insights for the stakeholders.

Working capital management has now gained the status as one of the important factors that determines the profitability of businesses worldwide. A successful management of working capital calls for a well-designed policy and periodic follow-up. Brigham and Houston highlights that working capital management involves both setting working capital policy and carrying out that policy in the day-to-day operations. It involves making decisions in cash, receivables and inventories as well as the level and mix of short-term financing. The need to maintain an its constituent components is mandatory for any profit maximizing firm, by ensuring that firms operate with sufficient fund (cash flows) that will honor their long term debt and satisfy both maturing short term obligation and upcoming operational expenses.

Working capital management's goal is to contribute to the firm's larger goal of value maximization by managing current assets in such a way that marginal returns on investment in these assets is equal to or greater than the cost of capital utilized to finance them. Working capital decisions should be made in such a way as to maximize shareholder wealth. Working capital ascertains a company's ability to continue its operations without endangering liquidity. The short-term capital refers to the capital that companies use in their daily operations and it consists of companies' current assets and current liabilities. *"A well-managed working capital promotes a company's well-being on the market in terms of liquidity and it also acts in favor for the growth of shareholders' value (Jeng-Ren, Li & Han-Wen, 2006)"*.

Working capital is also a major external source of capital for especially small and medium sized and high-growth firms. With relatively limited access to capital markets these small sized firms tend to overcome this complication by short-term borrowing. *"Working capital position of such firms is not only an internal firm-specific matter, but also an important indicator of risk for creditors (Moyer et al., 1992)"*. Higher amount of working capital enables a firm to meet its short-term obligations easier. This results increase in borrowing capability and decrease in default risk (and consequential decrease in cost of capital and increase in firm value). So, it is possible to state that efficiency in working capital management affects not only short-term financial performance (profitability), but also long-term financial performance (firm value maximization).

Cash conversion cycle (Fig 1 exhibited in the appendix) is an ongoing liquidity measure developed by Gitman (1974). Cash conversion cycle is calculated by adding inventory period to accounts receivables period and then subtracting accounts payables period from it. It focuses on the length of time between the acquisition of raw materials and other inputs and the inflow of cash from the sale of goods (Arnold, 1998). The shorter this cycle, the fewer resources the firm needs to tie up. Working capital is considered as life giving force for any economic enterprise and its management is considered among the most important function of corporate management. Individual components of working capital including cash and near cash instruments that can be converted into cash with minimal loss of time and value, marketable securities, account receivables and inventory management play a vital role in the performance of any firm.

This paper analyzes the effect of working capital management on firm's profitability in India for the period 1999 to 2017. This article explores the relationship between working capital management (and components thereof) and the industry adjusted accounting performance of corresponding firm. It draws its distinction from previous studies on this topic as it studies the impact of working capital on performance from the perspectives of listed/unlisted firms and size of board as well in the setting of an emerging economy.

Some of the important research articles on working capital management are where the researchers focused on analyzing relationship between working capital management and profitability relationship such as Gul, Khan, Rehman, Khan, Khan and Khan (2013); Oladipupo and Okafor (2013); Almazari, (2013); Akoto, Awunyo-Vitor and Angmor (2013); Maradi, Salehi and Arianpoor (2012); Nyabwanga, Ojera, Lumumba, Odondo and Otieno (2012); Sharma and Kumar (2011); Raheman, Afza, Qayyum and Bodla (2010); and Gill, Biger and Mathur (2010); Baumol (1952; Miller (1966); Johnson and Aggarwal (1998) among others.

Extant literature on the topic has considered various measures/proxies for working capital management in various ways. While some studied the impact of proper or optimal inventory management, others studied the management of accounts receivables trying to postulate an optimal way policy that leads to profit maximization. One of the most popular measure/proxies of working capital management is the cash conversion cycle. Cash Conversion Cycle is the time duration between the expenditure for the purchases of raw materials and the collection of sales of finished goods. However, the length of cash conversion cycle is a trade-off decision between hurting sales and struggling to keep the operations running for the corporates. A long cash conversion cycle might increase profitability because it leads to higher

sales. However, corporate profitability might decrease with the cash conversion cycle, if the costs of higher investment in working capital rise faster than the benefits of holding more inventories and/or granting more trade credit to customers. The management of working capital may have both negative and positive impact of the firm's profitability, which in turn, has negative and positive impact on the shareholders' wealth. The present study seeks to explore in detail these effects.

The importance of working capital management can be highlighted from the findings of previous research mentioned below:

"It directly affects the profitability and liquidity of firms (Raheman & Nasr, 2007)".

"The profitability liquidity tradeoff is important because if working capital management is not given due considerations then the firms are likely to fail and face bankruptcy (Kargar & Bluementhal, 1994)".

"The significance of working capital management efficiency is irrefutable (Filbeck & Krueger, 2005)".

"Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Mukhopadhyay, 2004)".

Working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms (Eljelly, 2004).

The remaining of the article is organized as follows: Section 2 contains relevant literature review on the topic of working capital management and the objectives for the study at hand, Section 3 contains data and research methodology, Section 4 contains descriptive statistics, Section 5 contains the results of regression analysis, Section 6 contains conclusion of the study and section 7 has appendix.

Literature review consisting some of previous studies though limited in scope and outnumbered regarding with the relationship between profitability and working capital management practices is given below.

2. LITERATURE REVIEW

Some of the prominent works in the area of working capital management and its impact of firms' performance are stated in this section of the article.

Long *et al.* (1993) created a model in their study for trade credit where asymmetric information leads good firms to extend trade credit. Their sample contains of COMPUSTAT firms a period of three years from 1985 to 1987. Trade credit policy is defined as the average time receivables and measured it by computing each firm's days of sales outstanding (DSO), as accounts receivable per dollar of daily sales. They averaged days of sales outstanding and other measures as well for the entire period. The findings suggest that producers may increase the implicit cost of extending trade credit by financing their receivables through payables and short-term borrowing.

In another study conducted by Shin and Soenen (1998) where they explored the relationship between working capital management and value creation. They measure working capital management by using cash conversion cycle (CCC). They analyzed this relationship by using correlation and regression analysis, by industry, and working capital intensity. They used a COMPUSTAT sample of 58,985 firm years covering the period 1975-1994 and subsequently found a strong negative relationship between the length of the firm's net-trade cycle and its profitability. This result as in line with previous studies expounding a negative relationship between working capital management and firm profitability.

Deloof (2003) worked on a sample of 1,009 large Belgian non-financial firms for a period of five years from 1992-1996 to analyze the link between working capital management and profitability. Using regression analysis, he found a significant and negative relationship between gross operating income and the number of days' accounts receivable, inventories, and accounts payable. He concluded on the basis of his result that managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories.

Eljelly (2004) worked to study the link between profitability and liquidity (measured by current ratio and cash gap (cash conversion cycle)) on a sample of 929 joint stock companies in Saudi Arabia. Significant negative relationship was found between the firm's profitability and its liquidity level. The same was not the case at the industry level where it was found that the cash conversion cycle is of more importance than current ratio that affects profitability.

Lazaridis and Tryfonidis (2006) studied a sample of 131 firms listed on the Athens Stock Exchange for the period of four years from 2001-2004 and found statistically significant relationship between profitability and the cash conversion cycle and components thereof (accounts receivables, accounts payables, and inventory).

Raheman and Nasr (2007) studied the impact of different constituent components of of working capital management including average collection period, inventory turnover in days, average payment period, cash conversion cycle, and current ratio on the net operating profitability of Pakistani firms. Working with a sample of 94 listed Pakistani firms for a duration of six years from 1999 – 2004, they found a strong negative relationship between the components of working capital management and profitability of the firm. They emphasized that managers can create positive value for the shareholders by reducing the cash conversion cycle.

Next up Garcia-Teruel and Martinez-Solano (2007) studied the relationship between working capital and firm's profitability. They took a panel of 8872 small to medium-sized enterprises (SMEs) from Spain covering the period for seven years from 1996-2002. They studied the effects of working capital management on SME profitability. The results showed that managers can create value by reducing inventories and the number of days of accounts outstanding. Reducing the cash conversion cycle also ameliorates the firm's profitability.

Falope and Ajilore (2009) studied 50 Nigerian non-financial firms for the period from 1996 to 2005. They applied panel data econometrics in a pooled regression, where cross-sectional and time-series observations were combined and estimated. They found a negative and significant relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle for the firms used in the study.

Mathuva (2010) studied the impact of working capital management components on corporate profitability on a sample of 30 firms listed on the Nairobi Stock Exchange (NSE) for the period from 1993 to 2008. Using a fixed effects regression models, he found a negative and significant relationship between the accounts collection period and profitability. He also found a positive and significant relationship between the inventory conversion period and profitability and a significant and positive relationship between average payment period and profitability.

Tripathi and Ahamed (2017) examined the impact of working capital management (WCM) measured by cash conversion cycle (CCC) on the financial performance of firms in the Indian context. The period of study was from the year 2000 to 2014 for companies listed on the National Stock Exchange, India. The study uses regression model to analyze panel data. Financial and banking related companies were removed from the dataset to mitigate bias. This study concluded that WCM is an important variable that affects the financial performance of firms. They stated that increasing the efficiency of CCC would lead to an increment in firm's performance up to a certain point which they referred to as the "performance summit" in their study. They conclude that there exists an inverse U-shaped relationship between WCM and performance and state that improved working capital policy could improve firm profitability by reducing the firm's CCC, thereby creating additional firm value.

Almazari (2013) studied the relationship between the working capital management (WCM) and the firms' profitability for cement manufacturing companies in the context of Saudi Arabia. His sample size is very small to be of any conclusive statistically meaningful result but he compensates for the small sample size by coupling it with time series data. The sample used by the author used 8 Saudi cement manufacturing companies listed on the Saudi Stock Exchange for the period of 5 years from 2008-2012. Regression results showed that in Saudi cement industry, current ratio was the most important liquidity measure which impacts profitability. When the sample was subjected to linear regression tests, it confirmed the existence of a high degree of association between the working capital management and profitability.

Akoto, Awunyo-Vitor and Angmor (2013) study on the relationship between working capital management and firm's profitability of listed firms in Ghana used data from 13 listed manufacturing firms in Ghana from 2005-2009. Using a panel data methodology to increase the number of observations they found a significant negative relationship between Profitability and Accounts Receivable Days. However, the firms' Cash Conversion Cycle, Current Asset Ratio, Size, and Current Asset Turnover were significantly positively linked to profitability.

3. METHODS

3.1. Data and Variables

Data for this study was collected from secondary sources only. Centre for monitoring Indian Economy

Kamath (1989) states that working capital management practices in retailing has a reverse relationship between cash conversion cycle and profitability. Soenen (1993) states that there is no statistically constant relationship between cash conversion cycle and profitability.

Different studies that have analyzed the relationship between working capital management and firm profitability in various markets across the world have yielded a mixed bag of results. However, a majority of studies conclude a negative relationship between WCM and firm profitability. Other studies which find out a positive relationship might have it because of different market setting, unique corporate governance policies which either incentivizes/penalizes certain actions resulting into the results that they found eventually. The studies have used different variables as proxies to analyze the relationship with different methodology such as linear regression and panel data regression. In a nutshell, the literature review indicates that working capital management impacts on the profitability of the firm but there still is ambiguity regarding the appropriate variables that might serve as proxies for working capital management and signs/direction of this relationship. This study investigates the relationship between a set of such variables and the industry adjusted firm performance.

The main objective of the paper is to examine the relationship between working capital management and profitability of firms listed on the National Stock Exchange (NSE) India.

To achieve the general objective, the following specific objectives were formulated:

• to determine whether there is a significant relationship between Average Receivable/Collection Period (AR) and Profitability of the firm.

• to ascertain if there is a significant relationship between Average Payment Period (AP) and Profitability of the firm.

• to establish whether there is a significant relationship between Inventory Conversion Period (INV) and Profitability of the firm.

• to examine if there is a significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

In order to fulfill the above listed out objectives, we have postulated the following hypotheses:

H_01: *There is no significant relationship between Average Receivable Period (AR) and Profitability of the firm.*

H_02: *There is no significant relationship between Average Payment Period (AP) and Profitability of the firm.*

H_03: *There is no significant relationship between Inventory Conversion Period (INV) and Profitability of the firm.*

H_04: *There is no significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.*

(CMIE) maintains the database "Prowess" that contains data on Indian companies and is considered to be the most comprehensive and authentic database in India. A total of 1532 Indian firms listed on the National Stock Exchange (NSE) for a period of 18 years (from 1999-2017) has been considered for the study. Not all of the 1532 firms

selected for this study were listed during the whole period of study. Only 610 firms were listed at the beginning & gradually more & more companies started to get listed until eventually 922 companies more got listed to the initial tally of 610 listed firms making the total number of listed companies to be 1532 by the end of the study period. A total of 19862 firm year observations correspond to listed firms & 9246 firm year observations for unlisted firms making it a total of 29108 firm year observations.

A sample of 1532 companies that eventually got listed on National Stock Exchange, India are studied from April of 1999 to March of 2017 making it one of the most comprehensive sample that has been studied thus far. Some of the firms got listed after 1999 and hence form the part of non-listed firm sample and forms a part of listed companies after its listing, e.g. 20 Microns Ltd. got listed in the year 2008 so it forms the part of non-listed sample of companies before 2008 and the same company forms part of listed sample of companies from 2008 onwards. The dataset used in this study is classified below in figure2:

Figure 2. Classification of dataset used for this study with the number of firm year observations given in parenthesis
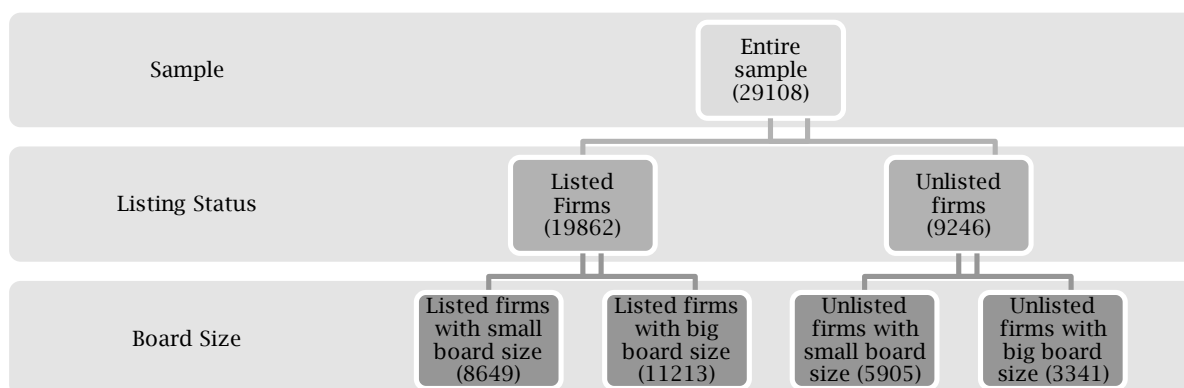
Raw data required to create the variables for this study were downloaded from Prowess (database managed by Centre for Monitoring Indian Economy) and the following variables were created:

Table 1. This table lists the formulae used for constructing all the variables used in this study

Notation	Formula used for calculating the variables
IAROA	ROA of firm – Industry mean of ROA of the same two digit NIC code
IACCC	CCC of firm – Industry mean of CCC of the same two digit NIC code
ROA	Profit after Tax / Total Asset
AR	No. of Days A/R = (Accounts Receivables/Sales) x 365
AP	No. of Days A/P = (Accounts Payables/Cost of Goods Sold) x 365
INV	No. of Days Inventory = (Inventory/Cost of Goods Sold) x 365
CCC	Cash Conversion Cycle = (No. of Days A/R + No. of Days Inventory) – No. of Days A/P
Debt_ratio	Borrowings / TA
FFA	Financial Assets / TA
Firm_age	Year 2017 – Incorporation year of the firm
board_size	Number of members on the board of directors (Median board size is 8.2 members. Firms having more number of members than 8.2 are classified as big board and less number of members than 8.2 as classified as small board.
board_indp	Number of independent members on the board of directors

In order to study the effects of working capital components on the firm performance of Indian firms, performance is measured by Return on Assets (ROA), which is defined as the ratio of PAT to total assets. IAROA is used as a dependent variable. The return on assets determines the management efficiency to use assets generates earnings. *It is a better measure since it relates the profitability of the company to the asset base (Padachi, 2006).* This study accounts for the inherent difference among the various industries and gives more robust results by using industry adjusted return on assets instead of raw return on assets. Industry adjusted return on assets is created by splitting the sample into their respective industry by using the two digit NIC code. A total of 62 industries are created and their average ROA is calculated on a year on year basis.

The average annual ROA of each industry is subtracted from the individual company's annual observation of the corresponding industry. This gives us the ROA which accounts for industry specific differences. The average collection period (AR); the inventory conversion period (INV); the average payment period (AP); and the Cash Conversion Cycle are used as the independent variables and are considered for measuring working capital management. AR is the time taken to collect cash from customers; INV refers to the time taken to convert inventory held in the firm into sales; AP is the time taken to pay the firm's suppliers while CCC is used as a comprehensive measure of working capital as it shows the time-lag between payment for the purchase of raw material and the collection of sales of finished goods. Apart from these variables,

the firm's age, leverage and corporate governance variables such as size of the board and the board's independence are introduced as control variables. The reason for choosing these variables is that most of researchers (Deloof, 2003; Garcia-Teruel & Martinez-Solano, 2007; Jose et al., 1996; Nazir & Afza, 2009; Raheman & Nasr, 2007; Huang et al. (2009); Shin & Soenen, 1998) have used these to calculate the relationship between WCM and profitability in various markets.

4. DESCRIPTIVE STATISTICS

The descriptive statistics of all the categories of firms used in this study is given in the tables that follow. Table 2 contains the Pearson correlation coefficient of the variables for the whole sample (listed and unlisted firm year observations). Each variable in this table and other tables of correlation coefficient has three rows representing the value of correlation coefficient, value of significance and number of observations respectively. Table 3 exhibits the descriptive statistics of all the variables for the whole sample (listed and unlisted firm year observations). Table 4 exhibits the descriptive statistics of all the variables for the listed and unlisted firms separately). Table 5 displays the OLS regression results for the entire sample (listed and unlisted firms). The independent variable is Industry adjusted return on assets (INROA) and the dependent variables are average time for accounts receivable (AR), average time for accounts payable (AP), (INV) and the cash conversion cycle (CCC) and dummy for listing status and board size are included. Table 6 is exactly the same as Table 5 except for the dummies. Table 7 shows the result of t test on IAROA of small board size and big board size companies and also shows the result of t test on IACCC of small board size and big board size companies. Table 8 shows the result of t test on IAROA of listed and unlisted companies and also shows the result of t test on IACCC of listed and unlisted companies.

Table 9 contains the Pearson correlation coefficient of the variables for the listed companies only in the sample. Table 10 displays the OLS regression results for the listed companies in the sample only. Table 11 contains the Pearson correlation coefficient of the variables for the unlisted companies only in the sample. Table 12 displays the OLS regression results for the unlisted companies in the sample only. Table 13 displays the correlation coefficient for the listed companies with small board only in the sample. Table 14 displays the OLS regression results for the listed companies with small board size only in the sample. Table 15 displays the correlation coefficient for listed companies with big board only in the sample. Table 16 displays the OLS regression results for the listed companies with big board size only in the sample. Table 17 displays the correlation coefficient for unlisted companies with small board only in the sample. Table 18 displays the OLS regression results for the unlisted companies with small board size only in the sample. Table 19 displays the correlation coefficient for unlisted companies with big board only in the sample. Table 20 displays the OLS regression results for the unlisted companies with big board size only in the sample. Table 21 shows

the result of t test on IAROA of listed companies and also shows the result of t test on IACCC of listed companies. Table 22 shows the result of t test on IAROA of unlisted companies and also shows the result of t test on IACCC of unlisted companies.

5. REGRESSION ANALYSIS

In this section the empirical findings on the relationship between working capital management and profitability of the firms in India are discussed. We used the ordinary least square model with industry adjusted performance variables. Table 5 (all companies listed as well as unlisted) gives the regression coefficient for Cash conversion cycle with IAROA and it is negative and significant reinforcing our premise that a shorter CCC is beneficial for the company. The squared term of CCC is however positive and significant for IAROA highlighting that the relationship CCC and IAROA is curvilinear in nature. It also highlights that there is a significant difference in the IAROA and IACCC between a listed and an unlisted company. The same however does not hold true for board size.

Table 7 and 8 compares the difference between IAROA and IACCC based on size of board and listing status of firms. They can be read as following.

A two sample t-test is conducted to compare the two population averages by comparing two independent samples. It assumes a continuous dependent variable and one categorical independent variable (with 2 levels which are listing status of the companies i.e. Listed and Non-listed and board size of the companies i.e. Small board if the number of directors are less than the median number of directors and Big board if the number of directors are more than the median number of directors); The two samples are independent; The two samples follow normal distributions. If the p-value (shown under "Pr>F") is greater than 0.05, then the variances are equal then read the "Pooled" section of the result When the p-value (shown under "Pr>F") is no more than 0.05, then the variances are unequal then read the "Satterthwaite" section of the result. In cases where the p-value is less than 0.05 we read the "Satterthwaite" section. If p value is below the level of significance, then we reject the null hypothesis that the two types of firm (listed and unlisted or small board size and big board size) are significantly different.

Table 10 shows the result of regression coefficient for CCC with IAROA for listed companies only and the magnitude of the CCC coefficient is negative and significant but more pronounced than what it is for all the firms included. Thus emphasizing that management of working capital is given more attention to in listed companies. One possible reason for it could be more scrutiny on these companies by the board as well as the investors and public at large. Table 12 on the other hand shows the result of regression coefficient for CCC with IAROA for unlisted companies only and the magnitude of the CCC coefficient is not significant at all in sharp contrast to its listed counterparts. Similar results follow for listed companies with small and big boards and unlisted companies with small and big board where listed companies have a stronger association between CCC

and IAROA with respect to unlisted companies irrespective of board size.

Model 1 of Table 5 tests the hypothesis that there is no significant relationship between Average Collection Period and profitability. The regression results indicate that the coefficient of ACP is negative with -5.24E-07, and is significantly different from zero (p-value =0.089). Thus, H_01 hypothesis is rejected and is concluded that ACP is statistically significant at 10% significance level (p>0.01). This suggests that short ACP is good for explaining the financial success of companies and it is a critical factor to consider when taking decision to improve profitability. H_02 and H_03 are not rejected in the same table. H_04 is significant for all the firms.

Model 1 of Table 10 tests the hypothesis that there is no significant relationship between Average Collection Period and profitability. The regression results indicate that the coefficient of ACP is negative with -5.33E-07, and is significantly different from zero (p-value =0.083). Thus, H_01 hypothesis is rejected and is concluded that ACP is statistically significant at 10% significance level (p>0.01). This suggests that short ACP is good for explaining the financial success of companies and it is a critical factor to consider when taking decision to improve profitability. H_02 and H_03 are not rejected in the same table. H_04 is significant for all the firms.

All the major dependent models of Table 12 are insignificant as they are for unlisted companies. All the major dependent models of Table 14 are insignificant except for model 4 where it is negative and significant. In Table 16, inventories and CCC are significant and all other variables are insignificant. All the major dependent models of Table 18 and Table 20 are insignificant as they are for unlisted companies.

5. CONCLUSION

Previous research predicts negative relationship between accounts receivables and corporate profitability. Our results are in line with the previous literature and reinforces this relationship to this extent, however our study finds the relationship to be curvilinear instead of a linear one as the sign of relationship changes from negative to positive (while remaining significant) from CCC to CCC^2 in the regression with IAROA being the dependent variable in the listed companies. The same relationship is insignificant for the unlisted companies. Thus we conclude that listed companies in India improves their industry adjusted Return on Assets as the period of Cash Conversion Cycle increases but once it reaches its peak it stars to decline for further increase in the period of Cash Conversion Cycle.

The presence of an inverted U shaped relationship between the Cash Conversion Cycle and Industry adjusted return on assets in the listed firms makes intuitive appeal as well. Firms have to have a trade-off between a conservative and a liberal cash conversion cycle to function optimally. Too conservative a working capital management policy would hurt the sales because buyers do not pay immediately at the time of purchase and take a gestation period before they do. On the other hand, too liberal a working capital management policy would be detrimental to the financial well-being of the company because a lot of resource would be locked up for a long time which the company would be devoid of using. With this framework in mind, the performance of a company should improve with an increase in number of days for the cash conversion cycle to the extent that significant cash is not locked up with the customers. After which the performance would reduce with an increase in number of days for the cash conversion cycle. Usage of industry adjusted performance measure makes the result even more robust as they account for the differences that exist in various industries.

One of the limitations of this study despite its wide coverage of data points is the specificity of its results. India is a rapidly growing economy with its unique set of characteristics and features that has a macroscopic bearing on overall economy and certain industries in particular. These characteristics are not uniform across different economies thus rendering the results of this study limited to the context of an emerging economy. A comparative study of this relationship between a developed economy and an emerging one taking their respective distinctive characteristics into account would be an interesting one to pursue in future.

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APPENDIX

Figure 1. Operating and cash conversion cycles. Fundamentals of corporate finance (Ross *et al.*, 2003)
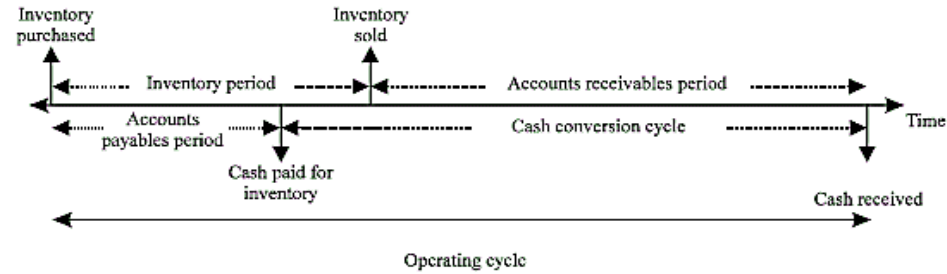
Table 2. Pearson Correlation coefficient for the whole sample (Listed and Unlisted included)

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients												
Prob > |r| under H$_0$: Rho=0												
Number of Observations												
IAROA	1											
	24162											
IACCC	-0.01814	1										
	0.0075											
	21704	21704										
ROA	0.94105	-0.02494	1									
	<.0001	0.0002										
	24162	21704	24162									
AR	0.00085	0.75277	0.00225	1								
	0.8962	<.0001	0.7296									
	23569	21704	23569	23569								
AP	-0.0011	0.01117	-0.00249	0.06344	1							
	0.8656	0.0998	0.7005	<.0001								
	23775	21704	23775	23404	23898							
INV	-0.00467	0.12187	-0.00628	0.03094	0.29157	1						
	0.4888	<.0001	0.3515	<.0001	<.0001							
	22015	21704	22015	21771	22003	22118						
CCC	-0.01698	0.75884	-0.03099	0.99639	0.0103	0.09948	1					
	0.0124	<.0001	<.0001	<.0001	0.129	<.0001						
	21704	21704	21704	21704	21704	21704	21704					
Debt_ratio	-0.64743	0.01858	-0.72244	0.15739	-0.00021	0.0093	0.02349	1				
	<.0001	0.0076	<.0001	<.0001	0.9755	0.1788	0.0007					
	22530	20648	22530	22137	22291	20892	20648	22611				
FFA	-0.40987	-0.00524	-0.39231	-0.00581	-0.00348	-0.0047	-0.00543	0.83477	1			
	<.0001	0.4401	<.0001	0.3722	0.5917	0.4857	0.424	<.0001				
	24162	21704	24162	23569	23777	22016	21704	22611	24353			

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients											

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients												
Prob > |r| under H$_0$: Rho=0												
Number of Observations												
Firm_age	0.01748	0.00593	0.01645	-0.00556	-0.00621	-0.00628	0.00097	-0.01486	-0.03437	1		
	0.0066	0.3822	0.0106	0.393	0.3373	0.3501	0.8865	0.0254	<.0001			
	24162	21704	24162	23569	23898	22118	21704	22611	24353	29108		
board_size	0.01651	-0.02332	0.02011	-0.04833	-0.01755	-0.03345	-0.02815	-0.06531	-0.02362	0.1982	1	
	0.0196	0.0017	0.0045	<.0001	0.0135	<.0001	0.0002	<.0001	0.0008	<.0001		
	19987	18080	19987	19574	19819	18363	18080	18637	20037	20278	20278	
board_indp	-0.01644	0.00541	-0.01547	0.00233	0.00197	-0.00789	0.00861	0.05732	0.02343	0.02263	-0.21014	1
	0.0382	0.5158	0.0511	0.7704	0.8039	0.3398	0.301	<.0001	0.0031	0.0041	<.0001	
	15896	14431	15896	15629	15836	14633	14431	14762	15901	16059	16059	16059

Table 3. Descriptive statistics of all the firm year observations included in the sample

Variable	N	Mean	Std Dev	Sum	Min	Max
Descriptive Statistics of all firms (Listed and Unlisted together)						
IAROA	24162	0	0.59209	0	-50.0847	58.82751
IACCC	21704	0	9565	0	-58515	888197
ROA	24162	0.03315	0.62917	801.0804	-51.0976	67.26282
AR	23569	631.0874	15801	14874099	0.00937	1190265
AP	23898	467.2474	24088	11166278	-2234	3390242
INV	22118	2708	131030	59903154	-47833	8489170
CCC	21704	426.2932	12605	9252268	-59140	1190247
Debt_ratio	22611	0.38055	1.14578	8605	6.25E-07	69.2439
FFA	24353	0.02041	0.18686	497.0879	0	12.09756
Firm_age	29108	35.24804	20.74158	1026000	2	154
board_size	20278	8.69277	3.24548	176272	1	30
board_indp	16059	0.52008	0.13177	8352	0.0625	1

Table 4. Descriptive statistics of the listed firm year observations and the unlisted firm year observations included in the sample

Variable	N	Mean	Std Dev	Sum	Min	Max	Variable	N	Mean	Std Dev	Sum	Min	Max
Descriptive Statistics of all firms (Listed firms only)							**Descriptive Statistics of all firms (Unlisted firms only)**						
IAROA	17938	-0.000489	0.62733	-8.77175	-50.08469	58.82751	**IAROA**	6225	0.00142	0.47614	8.83769	-31.0086	1.43891
IACCC	16353	51.91402	10364	848950	-58515	888197	**IACCC**	5351	-158.6526	6542	-848950	-35153	457245
ROA	17938	0.03134	0.6649	562.22306	-51.09756	67.26282	**ROA**	6225	0.03839	0.51243	238.9762	-32.3333	1.5089
AR	17598	772.96049	17892	13602559	0.0119	1190265	**AR**	5972	212.9229	6470	1271576	0.00937	492750
AP	17856	557.0881	27836	9947365	-2234	3390242	**AP**	6043	201.7183	2213	1218984	-1878	97565
INV	16650	3491	150998	58130675	-47833	8489170	**INV**	5468	324.1548	3848	1772478	-5257	187193
CCC	16353	482.24054	13988	7886080	-59140	1190247	**CCC**	5351	255.3147	6816	1366189	-3363	492487
Debt_ratio	16740	0.39193	1.30447	6561	6.25E-07	69.2439	**Debt_ratio**	5872	0.34806	0.45031	2044	5.53E-06	24
FFA	17944	0.02224	0.21421	399.07671	0	12.09756	**FFA**	6410	0.01529	0.0646	98.01122	0	1.00482
Firm_age	19862	39.11912	21.16202	776984	2	154	**Firm_age**	9247	26.93187	17.05952	249039	2	122
board_size	16216	9.09176	3.18038	147432	1	30	**board_size**	4063	7.1014	3.00648	28853	1	23
board_indp	13926	0.52043	0.12949	7248	0.0625	1	**board_indp**	2134	0.51773	0.14579	1105	0.07143	1

Table 5

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) & Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 & Model 4 respectively. All the listed and unlisted companies included with dummy for board size & listing status. First column of each model denotes the parameter estimates, next column contains t value & its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A *p* value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a *p* value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance & finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.042	3.8 (0.000)	0.000	0.038	3.45 (0.000)	0	0.044	4.55 (<.000)	0	0.044	4.57 (<.000)	0
AR/AP/INV/CCC	-5.24E-07	-1.7 (0.089)	1.003	-1.64E-08	-0.11 (0.911)	1	3.93E-09	0.12 (0.906)	1.000	-0.000	-2.95 (0.003)	4.796
FFA	-0.112	-4.47 (<.000)	1.009	-0.104	-4.09 (<.000)	1.009	-0.041	-1.64 (0.100)	1.005	-0.041	-1.62 (0.104)	1.005
Debt ratio	-0.109	-26.29 (<.000)	1.011	-0.106	-27.81 (<.000)	1.012	-0.099	-27.24 (<.000)	1.013	-0.098	-26.6 (<.000)	1.013
Firm age	0.000	2.97 (0.003)	1.075	0	3.22 (0.001)	1.073	0.000	2.18 (0.029)	1.068	0.000	2.25 (0.024)	1.069
Board Size	0.001	1.43 (0.152)	1.718	0.001	1.47 (0.141)	1.723	0.000	1.49 (0.136)	1.711	0.000	1.3 (0.195)	1.707
Board Indp	-0.014	-1.02 (0.308)	1.051	-0.012	-0.9 (0.368)	1.054	-0.006	-0.54 (0.586)	1.055	-0.006	-0.5 (0.614)	1.054
CCC²										5.73E-12	2.21 (0.027)	4.793
Size_Board	0.007	1.47 (0.142)	1.680	0.006	1.47 (0.142)	1.691	0.002	0.50 (1.676)	1.676	0.002	0.66 (0.510)	1.673
List_status	-0.018	-3.46 (0.000)	1.025	-0.018	-3.54 (0.000)	1.024	-0.020	-4.35 (<.000)	1.026	-0.019	-4.2 (<.000)	1.026

Table 6

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. All the listed and unlisted companies included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.026	2.64 (0.008)	0	0.023	2.23 (0.025)	0	0.030	3.32 (0.000)	0	0.031	3.4 (0.000)	0
AR/AP/INV/CCC	-5.50E-07	-1.78 (0.075)	1.002	-2.14E-08	-0.14 (0.884)	1.000	3.07E-09	0.09 (0.927)	1.000	-2E-06	-3.01 (0.002)	4.795
FFA	-0.115	-4.63 (<0.000)	1.007	-0.108	-4.25 (<0.000)	1.007	-0.046	-1.8 (0.071)	1.003	-0.0457	-1.78 (0.075)	1.003
Debt ratio	-0.109	-26.37 (<0.000)	1.010	-0.107	-27.9 (<0.000)	1.011	-0.100	-27.36 (<0.000)	1.012	-0.0993	-26.7 (<0.000)	1.012
Firm age	0.000	2.99 (0.002)	1.051	0.000	3.22 (0.001)	1.050	0.000	2.01 (0.044)	1.045	0.00016	2.09 (0.036)	1.046
Board Size	0.001	2.52 (0.011)	1.093	0.001	2.57 (0.010)	1.092	0.000	1.87 (0.061)	1.091	0.00086	1.63 (0.103)	1.091
Board Indp	-0.015	-1.11 (0.26)	1.050	-0.014	-1 (0.316)	1.053	-0.008	-0.68 (0.496)	1.054	-0.0078	-0.63 (0.527)	1.053
CCC²										5.82E-12	2.24 (0.025)	4.793

Table 7. Results of t test on Industry adjusted Return on Asstes (IAROA) and Industry adjusted Cash Conversion Cycle (IACCC) of all the firms (listed and unlisted) to find out the difference in mean of variable of interest based on size of board (small or big).

IAROA					IACCC				
Method	Variances	Df	t value	Pr > |t|	Method	Variances	Df	t value	Pr > |t|
Pooled	Equal	24160	-0.22	0.82	Pooled	Equal	21702	1.40	0.16
Satterthwaite	Unequal	14189	-0.25	0.80	Satterthwaite	Unequal	14536	1.74	0.08
Equality of Variances									
Method	Num Df	Den Df	F value	Pr > F	Method	Num Df	Den Df	F value	Pr > F
Folded F	17937	6223	174	<.0001		16352	5350	2.51	<.0001

Table 8. Results of t test on Industry adjusted Return on Asstes (IAROA) and Industry adjusted Cash Conversion Cycle (IACCC) of all the firms (listed and unlisted) to find out the difference in mean of variable of interest based on listing status of the board (listed or unlisted).

	IAROA					IACCC			
Method	Variances	Df	t value	Pr > |t|	Method	Variances	Df	t value	Pr > |t|
Pooled	Equal	24160	2.13	0.03	Pooled	Equal	21702	-2.59	0.00
Satterthwaite	Unequal	14604	2.04	0.04	Satterthwaite	Unequal	10301	-2.33	0.01
				Equality of Variances					
Method	Num Df	Den Df	F value	Pr > F	Method	Num Df	Den Df	F value	Pr > F
Folded F	11385	12775	6.24	<.0001		9641	12061	23.42	<.0001

Table 9. Pearson Correlation coefficient for the whole sample (Only Listed companies)

	Pearson Correlation Coefficients											
	Prob > |r| under H_0: Rho=0											
	Number of Observations											
	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
IAROA	1											
	17938											
IACCC	-0.02076	1										
	0.0079											
	16353	16353										
ROA	0.97048	-0.02909	1									
	<.0001	0.0002										
	17938	16353	17938									
AR	0.0014	0.73471	0.00276	1								
	0.8522	<.0001	0.7146									
	17598	16353	17598	17598								
AP	-0.00084	0.00425	-0.00225	0.06854	1							
	0.9111	0.5871	0.7644	<.0001								
	17734	16353	17734	17504	17856							
INV	-0.00515	0.12692	-0.00609	0.04125	0.25526	1						
	0.5073	<.0001	0.4335	<.0001	<.0001							
	16547	16353	16547	16399	16575	16650						
CCC	-0.01991	0.74006	-0.03409	0.99694	0.00485	0.10195	1					
	0.0109	<.0001	<.0001	<.0001	0.5347	<.0001						
	16353	16353	16353	16353	16353	16353	16353					
Debt_ratio	-0.69413	0.01923	-0.72552	0.16925	-0.00074	0.00937	0.02451	1				
	<.0001	0.0167	<.0001	<.0001	0.9241	0.2412	0.0023					
	16735	15472	16735	16471	16573	15638	15472	16740				
FFA	-0.46903	-0.00607	-0.45083	-0.00674	-0.00387	-0.00546	-0.00582	0.86677	1			
	<.0001	0.4376	<.0001	0.3713	0.6065	0.4823	0.4566	<.0001				
	17938	16353	17938	17598	17735	16548	16353	16740	17944			
Firm_age	0.01579	0.00515	0.01566	-0.0084	-0.00754	-0.00909	-0.00044	-0.01583	-0.03557	1		
	0.0344	0.5104	0.0359	0.2652	0.3136	0.2406	0.955	0.0406	<.0001			
	17938	16353	17938	17598	17856	16650	16353	16740	17944	19862		
board_size	0.01968	-0.03116	0.02187	-0.0581	-0.021	-0.04006	-0.03406	-0.0787	-0.02994	0.16964	1	
	0.0127	0.0002	0.0056	<.0001	0.0079	<.0001	<.0001	<.0001	0.0001	<.0001		
	16057	14639	16057	15760	15978	14868	14639	14946	16058	16216	16216	
board_indp	-0.01724	0.00698	-0.01604	0.00235	0.00275	-0.0087	0.00872	0.0623	0.02668	0.01874	-0.21297	1
	0.043	0.4348	0.0597	0.7843	0.7473	0.3267	0.3288	<.0001	0.0017	0.027	<.0001	
	13779	12532	13779	13542	13744	12718	12532	12765	13780	13926	13926	13926

Table 10

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only listed companies included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.021	1.93 (0.053)	0	0.016	1.49 (0.136)	0	0.023	2.26 (0.023)	0.000	0.024	2.37 (0.017)	
AR/AP/INV/CCC	-5.33E-07	-1.73 (0.083)	1.002	-1.27E-08	-0.09 (0.931)	1.000	3.75E-09	0.11 (0.914)	1.000	-2E-06	-2.87 (0.004)	4.850
FFA	-0.112	-4.35 (<0.000)	1.007	-0.105	-3.95 (<0.000)	1.008	-0.046	-1.69 (0.092)	1.004	-0.046	-1.67 (0.095)	1.004
Debt ratio	-0.109	-26.36 (<0.000)	1.013	-0.107	-27.73 (<0.000)	1.014	-0.099	-25.72 (<0.000)	1.015	-0.098	-25.1 (<0.000)	1.015
Firm age	0.000	3.26 (0.001)	1.052	0.000	3.49 (0.000)	1.050	0	2.43 (0.015)	1.046	0	2.48 (0.013)	1.047
Board Size	0.001	2.32 (0.020)	1.099	0.001	2.41 (0.016)	1.099	0.001	1.99 (0.046)	1.097	0.001	1.74 (0.082)	1.097
Board Indp	-0.010	-0.71 (0.474)	1.053	-0.009	-0.6 (0.545)	1.056	-0.007	-0.55 (0.583)	1.058	-0.007	-0.52 (0.606)	1.057
CCC²										5.84E-12	2.15 (0.031)	4.849

Table 11. Pearson Correlation coefficient for the whole sample (Only Unlisted companies)

	Pearson Correlation Coefficients											
	Prob > |r| under H_0: Rho=0											
	Number of Observations											
	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
IAROA	1											
	6225											
IACCC	-0.00759	1										
	0.5787											
	5351	5351										
ROA	0.7962	0.00504	1									
	<.0001	0.7123										
	6225	5351	6225									
AR	-0.00582	0.95763	-0.00477	1								
	0.6532	<.0001	0.7126									
	5972	5351	5972	5972								
AP	-0.01913	0.08034	-0.02391	0.04055	1							
	0.1371	<.0001	0.0631	0.0018								
	6042	5351	6042	5901	6043							
INV	-0.01128	0.13887	-0.03522	0.00077	0.54029	1						
	0.4041	<.0001	0.0092	0.9549	<.0001							
	5468	5351	5468	5372	5428	5468						
CCC	-0.0038	0.9684	-0.00417	0.98936	0.08042	0.13998	1					
	0.781	<.0001	0.7607	<.0001	<.0001	<.0001						
	5351	5351	5351	5351	5351	5351	5351					
Debt_ratio	-0.17463	0.01032	-0.70653	0.0034	0.025	0.05615	0.0091	1				
	<.0001	0.4579	<.0001	0.7982	0.0587	<.0001	0.5127					
	5796	5176	5796	5667	5719	5254	5176	5872				
FFA	-0.02479	-0.00244	-0.01812	-0.00259	-0.00749	-0.0112	-0.00506	-0.03523	1			
	0.0505	0.8583	0.1528	0.8415	0.5606	0.4077	0.7115	0.0069				
	6225	5351	6225	5972	6043	5468	5351	5872	6410			
Firm_age	0.02796	0.00068	0.02587	-0.00855	-0.02815	0.01583	0.00083	-0.04579	-0.08301	1		
	0.0274	0.9603	0.0412	0.509	0.0287	0.2417	0.9516	0.0004	<.0001			
	6225	5351	6225	5972	6043	5468	5351	5872	6410	9247		

		IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients													
Prob > |r| under H$_0$: Rho=0													
Number of Observations													
board_size		0.02783	0.03662	0.04058	-0.03195	-0.02136	-0.01649	-0.0142	-0.02594	-0.01607	0.17771	1	
		0.0811	0.0317	0.0109	0.0485	0.1856	0.3298	0.4049	0.115	0.3107	<.0001		
		3931	3441	3931	3815	3842	3495	3441	3692	3980	4063	4063	
board_indp		-0.01483	-0.0216	-0.03506	0.00337	-0.01871	0.00727	0.02451	0.00979	-0.01151	0.04619	-0.21519	1
		0.4951	0.3469	0.1067	0.8776	0.3923	0.7506	0.2858	0.6617	0.5962	0.0329	<.0001	
		2118	1899	2118	2088	2093	1915	1899	1998	2122	2134	2134	2134

Table 12

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only Unlisted companies included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.023	0.81 (0.420)	0	0.02405	0.85 (0.398)	0.000	0.045	2.8 (0.005)	0	0.046	2.75 (0.006)	0.000
AR/AP/INV/CCC	-6.60E-07	-0.16 (0.871)	1.002	-8.74E-07	-0.47 (0.636)	1.001	5.95E-08	0.06 (0.952)	1.008	0.000	0.21 (0.832)	8.954
FFA	-0.10497	-1.18 (0.240)	1.019	-0.10331	-1.16 (0.247)	1.019	0.015	0.23 (0.818)	1.014	0.015	0.23 (0.819)	1.016
Debt ratio	-0.07579	-2.86 (0.004)	1.016	-0.07723	-2.93 (0.003)	1.017	-0.109	-7 (<.000)	1.025	-0.109	-6.91 (<.000)	1.047
Firm age	0.00015281	0.56 (0.578)	1.026	0.00015451	0.56 (0.573)	1.027	0	-0.45 (0.653)	1.024	0.000	-0.49 (0.627)	1.047
Board Size	0.0037	1.9 (0.058)	1.056	0.00362	1.86 (0.062)	1.055	0.001	1.6 (0.11)	1.057	0.002	1.6 (0.111)	1.057
Board Indp	-0.02888	-0.82 (0.414)	1.044	-0.02835	-0.8 (0.4225)	1.045	0	-0.02 (0.986)	1.042	0.000	0 (0.997)	1.043
CCC^2										-5.62E-11	-0.07 (0.946)	9.041

Table 13. Pearson Correlation coefficient for the whole sample (Only listed companies with small board)

		IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients													
Prob > |r| under H0: Rho=0													
Number of Observations													
IAROA		1											
		7567											
IACCC		-0.02077	1										
		0.0949											
		6466	6466										
ROA		0.97847	-0.02976	1									
		<.0001	0.0167										
		7567	6466	7567									
AR		0.00291	0.73252	0.00442	1								
		0.8037	<.0001	0.7062									
		7288	6466	7288	7288								
AP		-0.00034	0.04241	-0.00167	0.09897	1							
		0.977	0.0006	0.8862	<.0001								
		7377	6466	7377	7205	7426							
INV		-0.00474	0.12324	-0.00451	0.03593	0.48605	1						
		0.6998	<.0001	0.7137	0.0037	<.0001							
		6609	6466	6609	6506	6577	6646						

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients												
Prob > |r| under H0: Rho=0												
Number of Observations												
CCC	-0.02048	0.73625	-0.03498	0.99797	0.03302	0.09555	1					
	0.0996	<.0001	0.0049	<.0001	0.0079	<.0001						
	6466	6466	6466	6466	6466	6466	6466					
Debt_ratio	-0.72682	0.0159	-0.74717	0.17968	-0.00272	0.00788	0.02314	1				
	<.0001	0.2145	<.0001	<.0001	0.8216	0.5339	0.0707					
	7008	6099	7008	6787	6856	6227	6099	7012				
FFA	-0.50947	-0.00793	-0.48593	-0.01092	-0.00564	-0.00808	-0.00774	0.89843	1			
	<.0001	0.5238	<.0001	0.3512	0.6283	0.5114	0.5338	<.0001				
	7567	6466	7567	7288	7378	6610	6466	7012	7572			
Firm_age	0.01249	0.01602	0.01046	0.00007	-0.00491	-0.00586	0.00811	0.00976	-0.0277	1		
	0.2774	0.1978	0.363	0.9955	0.6725	0.6327	0.5142	0.4137	0.0159			
	7567	6466	7567	7288	7426	6646	6466	7012	7572	8649		
board_size	0.00987	-0.05164	0.00683	-0.09105	-0.02521	-0.06678	-0.05109	-0.09124	-0.0199	0.03773	1	
	0.4156	<.0001	0.5729	<.0001	0.0392	<.0001	<.0001	<.0001	0.1005	0.0018		
	6809	5833	6809	6566	6690	5969	5833	6295	6809	6876	6876	
board_indp	-0.02021	-0.00024	-0.01713	-0.00707	-0.00107	-0.01719	0.00006	0.06754	0.03217	0.03086	-0.1391	1
	0.1217	0.9865	0.1896	0.5945	0.9348	0.2184	0.9966	<.0001	0.0137	0.0175	<.0001	
	5866	5033	5866	5676	5792	5131	5033	5411	5866	5924	5924	5924

Table 14

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only listed companies with small board included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.022	0.9 (0.367)	0.366	0.015	0.59 (0.554)	0	0.019	0.86 (0.388)	0	0.025	1.07 (0.286)	0
AR/AP/INV/CCC	-4.34E-07	0.99 (0.320)	0.319	5.45E-09	0.03 (0.978)	1	2.66E-09	0.06 (0.951)	1	-0.00000264	2 (0.045)	6.55
FFA	-0.147	3.36 (0.001)	0.001	-0.135	2.96 (0.003)	1.01	-0.053	1.08 (0.278)	1	-0.052	1.05 (0.294)	1
Debt ratio	-0.093	15.52 (<.000)	<.0001	-0.093	16.84 (<.000)	1.02	-0.079	14.66 (<.000)	1.02	-0.078	14.28 (<.000)	1.02
Firm age	0	2.45 (0.014)	0.014	0	2.79 (0.005)	1.02	0	1.17 (0.242)	1.01	0.0002334	1.19 (0.234)	1.01
Board Size	0.001	0.83 (0.404)	0.404	0.001	0.79 (0.428)	1.04	0.002	1.17 (0.243)	1.04	0.001	0.95 (0.342)	1.04
Board Indp	-0.047	1.54 (0.123)	0.123	-0.042	1.3 (0.192)	1.02	-0.035	1.25 (0.211)	1.02	-0.038	1.32 (0.185)	1.02
CCC²										6.70E-12	1.61 (0.106)	6.55

Table 15. Pearson Correlation coefficient for the whole sample (Only listed companies with big board)

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
Pearson Correlation Coefficients												
Prob > |r| under H0: Rho=0												
Number of Observations												
IAROA	1											
	10371											
IACCC	-0.02516	1										
	0.0124											
	9887	9887										
ROA	0.68611	-0.02563	1									
	<.0001	0.0108										
	10371	9887	10371									
AR	-0.03169	0.85831	-0.04623	1								
	0.0013	<.0001	<.0001									
	10310	9887	10310	10310								
AP	-0.01411	-0.13315	-0.02367	0.07571	1							
	0.1509	<.0001	0.016	<.0001								
	10357	9887	10357	10299	10430							
INV	-0.02381	0.18393	-0.04814	0.1599	0.14642	1						
	0.0176	<.0001	<.0001	<.0001	<.0001							
	9938	9887	9938	9893	9998	10004						
CCC	-0.0255	0.8953	-0.03812	0.95449	-0.14228	0.24249	1					
	0.0112	<.0001	0.0001	<.0001	<.0001	<.0001						
	9887	9887	9887	9887	9887	9887	9887					
Debt_ratio	-0.30173	0.0384	-0.44406	0.05581	0.02104	0.00649	0.02955	1				
	<.0001	0.0002	<.0001	<.0001	0.0381	0.5292	0.0042					
	9727	9373	9727	9684	9717	9411	9373	9728				
FFA	-0.00397	-0.00565	0.00126	-0.00446	-0.00542	-0.02754	-0.00772	-0.05152	1			
	0.686	0.5742	0.8981	0.651	0.5812	0.006	0.4428	<.0001				
	10371	9887	10371	10310	10357	9938	9887	9728	10372			
Firm_age	0.03154	0.00822	0.04644	0.01118	-0.01658	-0.04339	0.00677	-0.0727	-0.07685	1		
	0.0013	0.4137	<.0001	0.2564	0.0904	<.0001	0.5012	<.0001	<.0001			
	10371	9887	10371	10310	10430	10004	9887	9728	10372	11213		
board_size	0.03548	0.00349	0.0746	-0.00525	-0.01251	-0.04304	-0.00259	-0.07356	0.01527	0.04075	1	
	0.0006	0.7432	<.0001	0.6148	0.2279	<.0001	0.8079	<.0001	0.142	<.0001		
	9248	8806	9248	9194	9288	8899	8806	8651	9249	9340	9340	
board_indp	-0.01999	0.01348	-0.03528	0.00604	0.00333	0.05114	0.01535	0.08452	0.00901	0.05876	-0.19646	1
	0.0754	0.2431	0.0017	0.5923	0.7664	<.0001	0.1839	<.0001	0.423	<.0001	<.0001	
	7913	7499	7913	7866	7952	7587	7499	7354	7914	8002	8002	8002

Table 16

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only listed companies with big board included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.054	4.91 (<.000)	0	0.054	4.96 (<.000)	0	0.06073	5.38 (<.0001)	0	0.05879	5.19 (<.000)	0
AR/AP/INV/CCC	-7.57E-07	1.38 (0.168)	1	-5.55E-07	0.96 (0.336)	1	-0.0000129	3.27 (0.001)	1.0089	-0.00000292	2.17 (0.03)	6.4427
FFA	-0.076	2.72 (0.006)	1.01	-0.075	2.66 (0.007)	1.01	-0.06671	2.23 (0.025)	1.0084	-0.06451	2.15 (0.031)	1.0074
Debt ratio	-0.192	27.04 (<.000)	1.03	-0.192	27.6 (<.000)	1.03	-0.19403	27.34 (<.0001)	1.032	-0.19439	26.81 (<.000)	1.0352
Firm age	0.00005151	0.67 (0.502)	1.03	0.00005452	0.71 (0.475)	1.03	0.0000323	0.42 (0.677)	1.0338	0.00003928	0.5 (0.615)	1.0344
Board Size	0.00034247	0.56 (0.576)	1.05	0.00032197	0.53 (0.598)	1.05	0.00012029	0.19 (0.846)	1.056	0.00017488	0.28 (0.779)	1.0539
Board Indp	0.023	1.72 (0.085)	1.05	0.022	1.66 (0.097)	1.06	0.02272	1.66 (0.096)	1.0592	0.02235	1.63 (0.103)	1.0571
CCC²										1.51E-11	1.76 (0.079)	6.4485

Table 17. Pearson Correlation coefficient for the whole sample (Only Unlisted small board companies)

					Pearson Correlation Coefficients							
					Prob > |r| under H0: Rho=0							
					Number of Observations							
	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
IAROA	1											
	3819											
IACCC	-0.00612	1										
	0.7302											
	3176	3176										
ROA	0.41963	0.00725	1									
	<.0001	0.683										
	3819	3176	3819									
AR	-0.00668	0.97846	-0.0048	1								
	0.688	<.0001	0.7726									
	3620	3176	3620	3620								
AP	-0.02635	0.05886	-0.02272	0.11552	1							
	0.1101	0.0009	0.1685	<.0001								
	3677	3176	3677	3564	3677							
INV	-0.00045	0.08244	-0.01579	0.00062	0.31843	1						
	0.9794	<.0001	0.3664	0.9723	<.0001							
	3273	3176	3273	3191	3240	3273						
CCC	-0.00427	0.98206	-0.00257	0.996	0.06179	0.08766	1					
	0.8099	<.0001	0.8847	<.0001	0.0005	<.0001						
	3176	3176	3176	3176	3176	3176	3176					
Debt_ratio	-0.16854	0.00109	-0.7293	0.0044	-0.00229	-0.00961	0.00052	1				
	<.0001	0.9519	<.0001	0.797	0.8928	0.5914	0.9769					
	3514	3065	3514	3416	3454	3125	3065	3546				
FFA	-0.06072	-0.00261	-0.03647	-0.00389	-0.00939	-0.00938	-0.00481	-0.03039	1			
	0.0002	0.8833	0.0242	0.8151	0.5692	0.5915	0.7866	0.0704				
	3819	3176	3819	3620	3677	3273	3176	3546	3925			
Firm_age	0.04521	-0.00987	0.0403	-0.00858	-0.013	-0.01874	-0.01053	-0.06565	-0.10218	1		
	0.0052	0.5781	0.0128	0.606	0.4305	0.2838	0.553	<.0001	<.0001			
	3819	3176	3819	3620	3677	3273	3176	3546	3925	5905		

Pearson Correlation Coefficients											
Prob > |r| under H0: Rho=0											
Number of Observations											
	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
board_size	0.03771	0.03957	0.04941	-0.02111	-0.04467	-0.07262	-0.04059	-0.04613	-0.05184	0.08495	1	
	0.0622	0.0715	0.0145	0.306	0.0294	0.0008	0.0645	0.0279	0.0098	<.0001		
	2447	2075	2447	2352	2377	2122	2075	2273	2484	2553	2553	
board_indp	-0.01209	-0.01875	-0.01005	-0.0005	-0.00931	0.07078	0.02496	-0.04312	-0.04163	0.03376	-0.18152	1
	0.6648	0.5309	0.7189	0.9858	0.7409	0.0171	0.404	0.1343	0.135	0.2247	<.0001	
	1286	1120	1286	1259	1264	1134	1120	1207	1290	1295	1295	1295

Table 18.

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only unlisted companies with small board included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variables	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	-0.02368	-0.46 (0.645)	0	-0.02035	-0.4 (0.691)	0	0.02729	1.13 (0.258)	0	0.02434	1 (0.319)	0
AR/AP/INV/CCC	-5.74E-07	-0.12 (0.906)	1.0033	-0.00000156	-0.4 (0.6882)	1.0081	0.00000851	0.71 (0.479)	1.0146	0.00002309	0.94 (0.349)	4.0756
FFA	-0.12068	-0.93 (0.3512)	1.0258	-0.12323	-0.95 (0.3405)	1.0267	0.11465	1.23 (0.220)	1.0162	0.1124	1.2 (0.230)	1.0154
Debt ratio	-0.04392	-1.1 (0.2695)	1.0298	-0.04757	-1.2 (0.2306)	1.0315	-0.07777	-4.09 (<.000)	1.0555	-0.07699	-4.03 (<.000)	1.054
Firm age	0.00036279	0.81 (0.4177)	1.0277	0.00035877	0.8 (0.422)	1.0286	-0.00001984	-0.1 (0.922)	1.0289	-0.00001604	-0.08 (0.937)	1.0342
Board Size	0.00831	1.81 (0.071)	1.0394	0.00815	1.78 (0.075)	1.0425	0.00204	0.94 (0.348)	1.0379	0.00206	0.94 (0.345)	1.0376
Board Indp	-0.03063	-0.56 (0.577)	1.0352	-0.0313	-0.57 (0.568)	1.0348	0.00549	0.22 (0.829)	1.0339	0.007	0.27 (0.784)	1.0352
CCC²										-3.59E-09	-0.96 (0.337)	4.0443

Table 19. Pearson Correlation coefficient for the whole sample (Only Unlisted big board companies)

Pearson Correlation Coefficients											
Prob > |r| under H0: Rho=0											
Number of Observations											
	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
IAROA	1											
	2406											
IACCC	-0.02304	1										
	0.2828											
	2175	2175										
ROA	0.95789	-0.0162	1									
	<.0001	0.4502										
	2406	2175	2406									
AR	-0.0007	0.07449	-0.03822	1								
	0.9729	0.0005	0.0639									
	2352	2175	2352	2352								
AP	-0.01787	0.30498	-0.04502	0.08183	1							
	0.3851	<.0001	0.0286	<.0001								
	2365	2175	2365	2337	2366							
INV	-0.03313	0.55116	-0.09773	0.0775	0.85679	1						
	0.1208	<.0001	<.0001	0.0003	<.0001							
	2195	2175	2195	2181	2188	2195						

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp

	IAROA	IACCC	ROA	AR	AP	INV	CCC	Debt_ratio	FFA	Firm_age	board_size	board_indp
CCC	-0.00683	0.5792	-0.03599	0.1564	0.52582	0.94938	1					
	0.7501	<.0001	0.0934	<.0001	<.0001	<.0001						
	2175	2175	2175	2175	2175	2175	2175					
Debt_ratio	-0.23606	0.09193	-0.35742	-0.02966	0.06848	0.14294	0.1515	1				
	<.0001	<.0001	<.0001	0.1595	0.0011	<.0001	<.0001					
	2282	2111	2282	2251	2265	2129	2111	2326				
FFA	-0.0005	-0.00368	-0.00118	0.0012	-0.00571	-0.01455	-0.01859	-0.06735	1			
	0.9806	0.8638	0.9537	0.9535	0.7814	0.4957	0.3861	0.0012				
	2406	2175	2406	2352	2366	2195	2175	2326	2485			
Firm_age	0.02119	0.06265	0.01568	-0.04352	-0.04521	0.07536	0.12562	-0.00144	-0.04293	1		
	0.2989	0.0035	0.442	0.0348	0.0279	0.0004	<.0001	0.9448	0.0324			
	2406	2175	2406	2352	2366	2195	2175	2326	2485	3342		
board_size	0.00568	0.01839	0.04796	-0.05683	-0.02975	0.00182	-0.01759	-0.0148	0.03484	0.16843	1	
	0.8271	0.497	0.0647	0.0297	0.2551	0.9462	0.516	0.5775	0.178	<.0001		
	1484	1366	1484	1463	1465	1373	1366	1419	1496	1510	1510	
board_indp	-0.01659	-0.0107	-0.08346	-0.01753	-0.02615	-0.0142	0.03631	0.11521	0.03572	0.10559	-0.17581	1
	0.6327	0.7656	0.016	0.6143	0.4521	0.6919	0.3114	0.0012	0.3034	0.0022	<.0001	
	832	779	832	829	829	781	779	791	832	839	839	839

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

Table 20

Ordinary Least squares regression results for models with Accounts receivable (AR), Accounts payable (AP), Inventories (INV) and Cash Conversion Cycle (CCC) as dependent variables for Model 1, Model 2, Model 3 and Model 4 respectively. Only unlisted companies with big board included. First column of each model denotes the parameter estimates, next column contains t value and its corresponding p value in the parenthesis. The last column has the value of Variance Inflation Factor (VIF). A p value of 0.1 or less than that indicates that the estimate is significantly different from 0 at 10% level of significance, a p value of 0.05 or less than that indicates that the estimate is significantly different from 0 at 5% level of significance and finally p value of 0.01 or less than that indicates that the estimate is significantly different from 0 at 1% level of significance.

Variable	Model 1 (Dep variable = AR)			Model 2 (Dep variable = AP)			Model 3 (Dep variable = INV)			Model 4 (Dep variable = CCC)		
	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF	Parameter Estimate	t value (p value)	VIF
Intercept	0.06232	2.09 (0.036)	0	0.0633	2.17 (0.03)	0	0.06274	2.12 (0.034)	0	0.06528	2.19 (0.028)	0
AR/AP/INV/CCC	0.0000108	0.22 (0.827)	1.0062	-7.67E-08	-0.06 (0.954)	1.0111	2.96E-07	0.27 (0.784)	1.0243	0.00000126	0.08 (0.937)	12.9688
FFA	-0.06035	-0.64 (0.522)	1.0165	-0.04874	-0.51 (0.606)	1.0151	-0.06333	-0.67 (0.506)	1.0166	-0.06382	-0.67 (0.503)	1.01868
Debt ratio	-0.13397	-5.06 (<.000)	1.0213	-0.13399	-5.06 (<.000)	1.0282	-0.15737	-5.72 (<.000)	1.0554	-0.16335	-5.77 (<.000)	1.10708
Firm age	1.383E-05	0.06 (0.955)	1.0341	2.515E-05	0.1 (0.918)	1.037	-6.669E-05	-0.27 (0.787)	1.0354	-0.00010496	-0.41 (0.679)	1.08518
Board Size	0.00106	0.55 (0.584)	1.0444	0.0009291	0.48 (0.630)	1.0384	0.00149	0.76 (0.448)	1.0337	0.00151	0.77 (0.442)	1.03598
Board Indp	-0.0086	-0.22 (0.796)	1.0664	-0.00743	-0.22 (0.823)	1.0676	0.00736	0.21 (0.830)	1.0809	0.00777	0.23 (0.822)	1.08153
CCC²										1.97E-10	0.18 (0.853)	12.9274

Table 21. Results of t test on Industry adjusted Return on Asstes (IAROA) and Industry adjusted Cash Conversion Cycle (IACCC) of listed firms to find out the difference in mean of variable of interest based on size of board (small or big)

IAROA					IACCC				
Method	Variances	Df	t value	Pr > |t|	Method	Variances	Df	t value	Pr > |t|
Pooled	Equal	17936	2.65	0.00	Pooled	Equal	16351	-2.87	0.00
Satterthwaite	Unequal	7833.1	2.28	0.02	Satterthwaite	Unequal	6768.3	-2.36	0.01
Equality of Variances									
Method	Num Df	Den Df	F value	Pr > F	Method	Num Df	Den Df	F value	Pr > F
Folded F	7556	10370	41.42	<.0001		6465	9886	27.98	<.0001

Table 22. Results of t test on Industry adjusted Return on Asstes (IAROA) and Industry adjusted Cash Conversion Cycle (IACCC) of unlisted firms (listed and unlisted) to find out the difference in mean of variable of interest based on listing status of the board (listed or unlisted)

IAROA					IACCC				
Method	Variances	Df	t value	Pr > |t|	Method	Variances	Df	t value	Pr > |t|
Pooled	Equal	6223	-0.56	0.57	Pooled	Equal	5349	-0.5	0.61
Satterthwaite	Unequal	3035.1	-0.48	0.62	Satterthwaite	Unequal	3752.7	-0.59	0.55
Equality of Variances									
Method	Num Df	Den Df	F value	Pr > F	Method	Num Df	Den Df	F value	Pr > F
Folded F	2405	3818	4.87	<.0001		3175	2174	15.5	<.0001