

**Determinants of Working Capital Management:
Empirical Evidence from Chinese Electronic
Industry**

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ABSTRACT

This thesis is an empirical analysis to assess the factors that affect working capital management in Chinese firms which operate in electronic industry by exerting descriptive analysis, Pearson correlation, OLS, fixed and random effects model. In this study as dependent variable, cash conversion cycle has been exerted as a measure of working capital management. On the other hand, cash flow, capital expenditure, firm size, sales growth, leverage, return on equity, gross domestic product growth rate and annual inflation rate have been devoted as explanatory variables.

The result of this study revealed that the working capital management have significantly negative association with capital expenditure, firm size, and gross domestic product growth rate.

Keywords: Working capital management, China, Fixed effects, Random effects

ÖZ

Bu tez, betimsel analiz, Pearson korelasyonu, en küçük kareler yöntemi, sabit etki modeli ve rastgele etki modeli kullanarak, elektronik endüstrisinde faaliyet gösteren Çin firmalarındaki işletme sermayesi yönetimini etkileyen faktörleri inceleyen ampirik bir analizdir. Bu araştırmada, nakit dönüşüm döngüsü, işletme sermayesi yönetimi olarak değerlendirilip bağımlı değişken olarak alınmıştır. Diğer yandan, nakit akışı, sermaye harcamaları, firma hacmi, satış büyümesi, koza sahip olma, özsermaye getiri oranı ve yıllık enflasyon oranı, açıklayıcı değişkenler olarak belirlenmiştir.

Bu araştırmanın sonuçları, işletme sermayesi yönetimi ile sermaye harcamaları, firma hacmi ve gayri safi yurtiçi hâsıladaki büyüme oranı arasında negatif ve anlamlı bir ilişki olduğunu göstermiştir.

Anahtar kelimeler: İşletme sermayesi yönetimi, Çin, sabit etki, rastgele etki

To my wife and my best friend Farnaz Joudifar and my compassionate parents,

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LIST OF ABBREVIATIONS

CAPEX	Capital Expenditure
CCC	Cash Conversion Cycle
CF	Cash Flow
CA	Current Asset
CL	Current Liability
GDP	Gross Domestic Products Growth Rate
SGROWTH	Sales Growth
IMF	International Monetary Fund
INF	Inflation Rate
LEV	Leverage
NTC	Net Trade Cycle
OLS	Ordinary Least Squares
ROE	Return on Equity
SIZE	Firm Size
WC	Working Capital
WCM	Working Capital Management

Chapter 1

INTRODUCTION

1.1 Background of Study

In the corporate finance studies, the long-term fiscal decisions like dividends policy, leverage, and investment budgeting were emphasized traditionally and there was a lack of concentration on short-term financial decisions. Throughout the preceding two decades, short-term financial decisions such as managing of working capital (WC) have absorbed by scholars as well as chief financial officers (Nobanee, Abdullatif, & AlHajjar, 2011). According to Moyer, McGuigan, and Kretlow (2006, p. 500) the most vital part of the companies management issues is working capital management (WCM). The WCM determines the volume of initial resources and uses of WC to increase wealth of shareholders (Chiou, Cheng, & Wu, 2006). WCM includes planning and controlling of the current assets (CA) as well as the current liabilities (CL) in a way which eliminates the venture of financial failure to prevent abuse through short-term obligations and investment over these assets under their dominance (Brigham, et al. 1999, Gitman, 1997). Manoori & Muhammad (2012) found that firms can hardly survive and go on with their daily operations without the appropriate level of WC. Managing the CA as well as CL which financed by the WC requires a lot of managerial times and efforts and as a result assumes the greater importance (Chang, Dandapani, & Prakash, 1995).

WC is a measure of liquidity as sufficient cash to fulfill company's obligations. Charitou, Elfani, and Lois (2010) suggested that firm's aptitude to face with their routine operations as a different definition of WC. Based on Qazi et al. (2011) research about how firm's profitability is affected by WC, the WC is as an index to determine the degree of liquidity and solvency of a firm, especially if it uses to compare other financial indicators and ratios. WC is the verge of safety to creditors, thus the companies in the short-term with the problem of facing borrowing should have higher WC. Naser, Nuseibeh, and Al-Hadeya (2013) suggested that companies should have rational WC to make sure that they can cover their commitment in short-term as well as ability to shell out their coming operating costs. The standard definition of WC can be explained by the following equation: $WC = CA - CL$ (Etiennot, Preve, & Allende, 2011).

In the WC theory, it is thought that the CL should be settled by the CA (Senthilkumar & Panneerselvam, 2016). In this case, the CA after payment of the CL remains in the WC of the company. Furthermore, if all of the CL become to CA, the difference between CA and CL is the capital of the company that will become the CA. The primary aim of the WC is to make sure that companies have adequate flow of the cash to survive in common operating for diminishing the risk of failure to meet their obligations in short-term (Samiloglu & Akgün, 2016).

Gill, Biger, and Mathur (2010) in their research about the association among WCM and American companies profitability argued that one of the essential constituents of the managing corporate finance is the WCM which has a straight impact on firms profitability. On the other hand, additional aspect of WCM is that it could be a successful management only through the dealing with WC constituents (Ganesan,

2007). According to Padachi and Howorth, (2014) failure in WCM can lead to make such a problem like assembly interruption, aggregation remain bills, and some others. (Padachi & Howorth, 2014).

The increasing importance of WCM is that it has made the series of proficiencies in financial management (Deloof, 2003). The reasons for the importance of this issue are as follows: Actual and desired levels of current assets (due to changes in actual and projected sales occurs) are subjected to the permanent change. This situation makes the information desired or required level of current assets, as continuous (daily) decisions to be taken. According to Sathyamoorthi (2002) WCM take almost the time of financial managers. Perhaps due to the changes that have occurred in the current assets, managers are forced to finance the decisions that have already been revised. The sources and funds that are allocated to WC should be determined (Alipour, 2011).

There are several measures for WCM which the most popular one is the CCC. However, there are some other gauges such as net trade cycle (NTC), and working capital requirement (WCR). Based on the preceding scholars, cash conversion cycle (CCC), the most famous and reliable tool to assess WCM, has been preferred in this study.

1.2 Research Gap

According to the International Monetary Fund (IMF) annual report for the year 2015 after the United States of America (USA), the largest economy in the world is China based on the nominal gross domestic product which depicted that China constitute 80 percent of the world's GDP in 2015. However, WCM and its factors which is the one

of the key part of managing companies has not investigated in this country. Therefore, it will be an essential research for the second largest economy around the world.

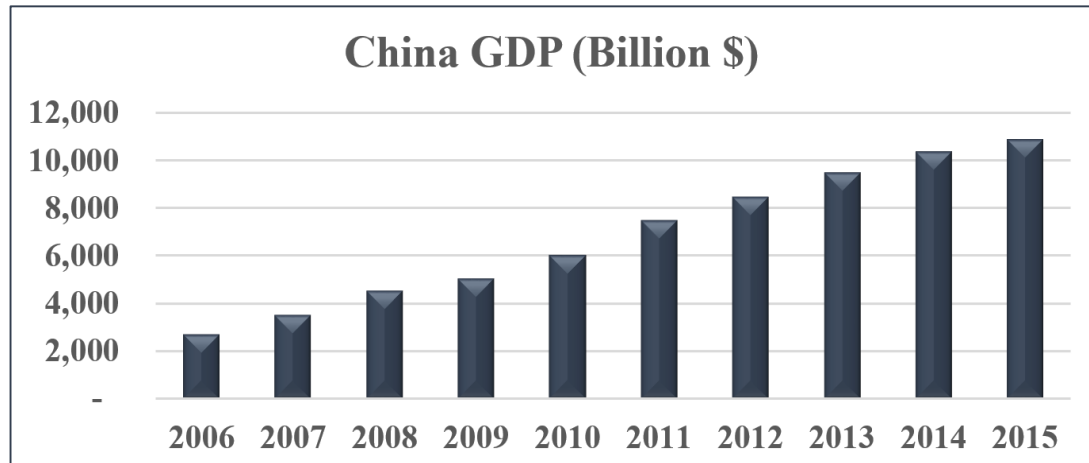


Figure 1: China GDP, retrieved from IMF 2016

1.3 Research Question

In order to specify the components that might influence WCM, two primary questions will be appeared. The following main questions that pursue in this thesis are tested by using relevant hypotheses:

- i) What are the factors that affect WCM in Chinese electronic companies?
- ii) How do these factors affect WCM?

1.4 Research Objective

The current thesis objective is to make provision the empirical exploration on the determinants of WCM in Chinese firms which operate electronic industry. This study tried to empirically examine the association between the CCC as a gauge of the WCM and factors which influence WCM. These factors consist of cash flow (CF), capital expenditure (CAPEX), firm size (FSIZE), leverage (LEV), sales growth (SGROWTH), return on equity (ROE), gross domestic product growth rate (GDP) and annual inflation rate (INF).

1.5 Significant of the Study

This thesis is the first consideration which empirically investigates the determinants of WCM in the Chinese electronic industry. This is expected to provide important implication for future studies and administration of the companies. Accordingly, corporate managers as well as financial managers can use this thesis to make better decision about how they can manage WC which is the lifeblood of the companies (Sathyamoorthi, 2002).

1.6 Scope of the Study

In this thesis, 289 firms which operate in electronic industry in China have been chosen. Lack of data in many firms led to omit 191 firms therefore 98 firms have been remained. The data which are selected based on the financial statements have been extracted from DataStream for the period from 2005 through 2014. Finally, there are 980 firms- years observation for this study.

1.7 Limitation of the Study

One of the most important limitation is that this study is done only in a single country and in an industry. Probably, future study should focus on the other industries as well as the other countries to make comparison between some industries in specific country or between electronic industry in two or more countries. Another essential limitation is that because some variables that may be influenced WCM need to be acquainted with more detail about companies such as age of the firm, number of board directors, number of employees and so on, the author has used variables which can be calculated based on the available data in the balance sheet as well as income statement.

1.8 Structure of Study

This thesis consists of five distinct chapters. The first chapter aimed to give an overview about the WCM and the fundamentals of this study as an introduction. The

second one try to investigate preceding scholars about which factors can influence WCM and divided into six main parts as follow: WCM and firm's profitability, Determinants of WCM, CCC and other related literatures, variables explanation and hypothesis as well as conceptual model. The third chapter is methodology segment which explains data collection, model of the study, and all estimation methods which have been exerted. Chapter four attempts to analyze the model of the study as well as compares the results with previous scholars. Finally, chapter five illustrates the summery of the study as a conclusion and managerial implications.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The literature review reveals significant number of studies which have investigated how WCM and firm's profitability are related to each other (e.g., Shin & Soenen, 1998; Yucel & Kurt, 2002; Deloof, 2003; Lazaridis & Tryfonidis, 2006; Raheman & Nasr, 2007; Uyar, 2009; Erasmus, 2010; Attari & Raza, 2012; Iqbal & Zhuquan, 2015, Tsagem et al., 2015). The majority of these researches present that WCM has the negative effect on firm's profitability.

Furthermore, the literature review also demonstrates some studies which have investigated that what factors influence the WCM (e.g., Chiou et al., 2006; Kieschnick et al., 2006; Appuhami, 2008; Nazir & Afza, 2009; Mansoori & Muhammad, 2012; Mathuva, 2014; Mongrut et al., 2014).

There are some measurement methods for assessing WCM like CCC which is exerted in many preceding studies (e.g. Deloof, 2003; Kieschnick, Laplante, & Moussawi, 2006; Teruel & Solano, 2007; Raheman & Nasr, 2007; Zariyawati, Taufiq, Annuar, & Sazali, 2010; Mansoori & Muhammad, 2012; Wasiuzzaman & Arumugam, 2013; Yenice, 2015), NTC which is exerted in some scholars (e.g. Shin & Soenen, 1998; Baños-Caballero, Teruel, & Solano, 2009; Erasmus, 2010; Nobanee & Abraham,

2015), and WCR (e.g. Chiou, Cheng, & Wu, 2006; Appuhami, 2008; Nazir & Afza, 2009).

2.2 WCM and Firms Profitability

Soenen (1993) by analyzing about 2000 firms from 20 distinct types of industries over the period 1970 to 1989 tried to examine how WCM associated with firm's profitability. He found that NTC (which in his research calculated like CCC) has an inverse association with return on assets (ROA) which is exerted to assess profitability of companies.

Shin and Soenen (1998) examined the relationship between NTC as a gauge of the WCM and firm's profitability with the 58,985 firm-year observation over the period 1975 through 1994 by using correlation matrix and regression analysis. Their study results demonstrate that profitability has an inverse significant association with WCM and FSIZE has a positive association with WCM.

Yucel and Kurt (2002) investigated the association between CCC and firm's profitability over 167 companies' financial statements from Istanbul Stock Exchange (ISE) for the period 1995 through 2000 in Turkey. they have used regression, Pearson correlation and comparative examination. Their study results depict that ROA and ROE have a negative association with CCC as a measurement tool of WCM. Also, they found that LEV has no significant nexus with CCC.

Deloof (2003) examined how does WCM impact on profitability of firms by using financial data of 1009 non-financial Belgian companies for the period 1992 to 1996. On the basis of the Pearson correlation analysis and regression estimation model, he realized that there is an inverse significant association among CCC and profitability.

Eljelly (2004) investigated the association among CCC and firm's profitability by exerting the Pearson correlation as well as regression analysis on 29 Saudi Arabia stock companies over the period 1996 through 2000. He found that the connection between FSIZE and CCC is significantly positive and the nexus between profitability and CCC is inversely.

Lazaridis and Tryfonidis (2006) analyzed the association among WCM and profitability of firms by exerting correlation as well as regression estimation method to assess financial data of 131 firms over the period 2001 through 2004 in Greece. The outcomes of their study show that CCC and profitability are significantly negatively related together.

García-Teruel and Martínez-Solano (2007) made provision a research about what are the influences of WCM on profitability of Small-Medium Entities companies in Spain by exerting panel data of 8,872 firms over the period 1996 through 2002. They realized that there is an inverse significant association among CCC and profitability of firms.

Raheman and Nasr (2007) deliberated the determinants of WCM that affect firm's profitability on financial data of 94 Pakistani companies over the period from 1990 through 2004. The findings of their research declares that there are inverse significant association among FSIZE and profitability with CCC on the basis of the Pearson correlation as well as regression analysis.

Uyar (2009) demonstrated that an inverse significant relation exists among the CCC and profitability by using ANOVA (Analysis of Variance) and correlation analysis.

He also found that this type of association among CCC and firms size. In his study, data was selected from financial statement of Istanbul Stock Exchange (ISE) in 2007.

Zariyawati et al., (2009) investigated the association among WCM and profitability of Malaysian companies. The sample of their research contained of 148 firms over the period from 1996 through 2006 and the analysis has been done by exerting pooled OLS as well as fixed effects. The outcomes of their research demonstrate that profitability had a negative nexus with CCC.

Erasmus (2010) explored the nexus between WCM and profitability by exerting the NTC as a gauge for measuring WCM and based on 319 South African industrial firms' data. The findings of his research indicate an inverse significant linkage among NTC and profitability.

Attari and Raza (2012) examined the association between CCC as a measure of WCM with profitability and FSIZE in Pakistan over 31 firms from four different industries in Karachi Stock Exchange over the period 2006 through 2010 by exerting ANOVA (Analysis of Variance) as well as Pearson correlation analysis. On the basis of the outcomes of their study, FSIZE has a significant association with CCC and profitability has a significant positive relation with CCC.

Anser and Malik (2013) examined changing in profitability of firms by assessing effect of CCC over 155 production firms in Pakistan for the period from 2007 through 2011. Based on descriptive statistics, correlation matrix as well as regression analysis methods they found that there is an inverse nexus among CCC and ROE as measurements for profitability.

Panigrahi (2013) investigated the relationship between CCC and profitability by assessing CCC influence on firm's profitability in top 5 Indian cement manufacturing firms over the period 2001 through 2010. On the basis of the descriptive statistics as well as regression estimation model, the result of his study indicated that ROE as a gauge of profitability has a significant positive relation with CCC.

Yazdanfar and Öhman (2014) found out a length of CCC significantly effects on company's profitability based on the implementation an empirical study on how does profitability of firms influence by CCC. They analyzed financial data of 13,797 small-medium enterprises which has selected from four different industries by utilizing Pearson's correlations and seemingly unrelated regression.

Muscettola (2014) inquired how does CCC effect on companies' profitability by using Pearson correlation, cluster and OLS analysis methods to assess 4,226 Italian small-medium entities firms. The finding of his research indicated that it is not necessary to has an inverse significant association among CCC and profitability.

Bhutto et al., (2015) by utilizing descriptive, Pearson correlation and analyze of variance (ANOVA) estimation techniques over financial data of 157 public firms in 12 different industries from Karachi Stock Exchange in 2009, investigated the association between CCC, FSIZE, company profitability and two different aspects of WC policy in Pakistan. Based on their study, it revealed that sales revenue and ROE have a negative association with CCC and there is a significant association among CCC. In addition, FSIZE and CCC has a positive association with ROA.

Iqbal and Zhuquan (2015) analyzed the data of 85 Pakistani firms which retrieved from Karachi Stock Exchange over the period of 2008 through 2013 to determine the association among WCM and profitability. Their results demonstrate an inverse significant connection among CCC and profitability.

Tsagem et al., (2015) tried to analyze small and medium-sized entities profitability that is influenced by WCM, corporate governance and size of the board by exerting regression analysis. The data of this research has collected from financial statement of 47 small and medium firms over the period 2008-2012 in Nigeria. Their finding shows a significant positive association among CCC and firm's profitability.

2.3 Determinants of WCM

Chiou et al., (2006) investigated the consequents of WCM by using WCR as a measure of WCM on 548 Taiwanese firms over the period 1996 to 2004 (35 quarter) retrieved from TEJ database by utilizing regression analysis. Based on the finding of their research there is an inverse association between WCM with operation CF and positive nexus between WCM and FSIZE. In addition, they did not find any association between WCM and SGROWTH.

Kieschnick et al., (2006) investigated the consequences of WCM and its outcome in American public firms over the period of 1990 to 2004 by utilizing OLS, fixed effect as well as GMM. The outcomes of their research demonstrate that the SGROWTH and FSIZE has a significant negative nexus with WCM.

Nazir and Afza (2009) aimed to analyze the factors that influence firms WCR. For this objective, they have undertaken financial data of 132 manufacturing companies between the period 2004 through 2007 from Karachi Stock Exchange in Pakistan.

They found the inverse and strong association among WCM and LEV. The result also indicated that operation CF, SGROWTH and FSIZE have a positive relationship with WCM.

Zariyawati et al., (2010) explored the consequences of WCM on financial data of 119 firms over the years 2000-2006 that solicited from Kuala Lumpur Stock Exchange Malaysia. The result of this study on the basis of pooled OLS, fixed and random effects analysis estimation indicated that FSIZE, LEV, INF and SGROWTH have an inverse significant association with CCC and GDP has a positive association with CCC.

Mansoori and Muhammad (2012) examined the effects of the essential factors on WCM by using secondary data of 94 firms retrieved from main board of the Singapore Exchange (SGE) between 2003 and 2010 (752 firm-year observations). They found that FSIZE, operation CF, CAPEX and GDP have a negative relationship with CCC. Also, they revealed that there is a positive association among profitability and CCC.

Palombini and Nakamura (2012) investigated essential elements of WCM by working on financial data for 2976 public firms over the period of 2001 to 2008 in Brazil. They utilized panel data model, fixed and random effects, pooled OLS as well as feasible generalized least squares. On the basis of their results, FSIZE and SGROWTH have a negative relationship with CCC.

Mohamad and Elias (2013) assessed secondary data of 151 randomly selected firms in Kuala Lumpur Stock Exchange Malaysia between 2002 and 2011 (10 years) to evaluate WCM. Their result demonstrated a positive significant association among

CAPEX and CCC. In addition, GDP has a positive association with CCC and there is an inverse association among SGROWTH and CCC.

Mongrut et al., (2014) by using an unbalance panel data with fixed effects estimation model analysis on financial data of non-financial and non-utilities companies from five Latin American countries over the period 1996 to 2008, analyzed the determinants of WCM. Their result shows that FSIZE has a significant inverse and SGROWTH has a positive relationship with CCC.

Yenice (2015) by exerting financial statement of 128 firms which named on Istanbul Borsa (BIST) between 2003 and 2013 in Turkey, investigated the relationships between WCM and macroeconomic variables. He found that there are relationships and macroeconomic variables influence on WC. Based on his study, there is a relationship between GDP and INF with CCC.

Table 1 represents the summary of the results in which preceding scholars that found the association among WCM and its components that cited in this part.

Table 1: Summary of the determinants of WCM in previous research

<i>Researchers</i>	<i>Independent variables</i>	<i>Findings: coefficient sign</i>
Chiou et al., (2006)	CF	- significant
	FSIZE	+ significant
	SGROWTH	Not significant
Kieschnick et al., (2006)	FSIZE	- significant
	SGROWTH	- significant
Nazir and Afza (2009)	CF	+ significant
	FSIZE	+ significant
	SGROWTH	+ significant
	LEV	- significant
Zariyawati et al., (2010)	FSIZE	- significant
	SGROWTH	- significant
	LEV	- significant
	GDP	+ significant
	INF	- significant
Mansoori and Muhammad (2012)	CF	- significant
	CAPEX	- significant
	FSIZE	- significant
	ROE	+ significant
	GDP	- significant
Palombini and Nakamura (2012)	FSIZE	-
	SGROWTH	-
Mohamad and Elias (2013)	CAPEX	+ significant
	SGROWTH	-
	GDP	+
Mongrut et al., (2014)	FSIZE	- significant
	SGROWTH	+ significant

2.4 CCC and Other Related Literatures

Besley and Meyer (1987) examined the relationship between CCC as a measurement of liquidity and firm's profitability and FSIZE in 1000 Certified Public Accounting companies for the years 1984 to 1988 in the USA by utilizing Pearson correlation analysis as well as regression estimation model. Their findings show that the ROE has a positive relationship with CCC and INF has no significant association with CCC.

Moss and Stine (1993) studied retail firms in the USA during the period 1971 to 1990 to determine the difference of CCC in diverse FSIZE (1,717 firm-year observations). In this study, they used regression analysis to assess this relationship. They found that FSIZE and CF have an inverse association with CCC.

Jose et al., (1996) investigated the association among firm's profitability and CCC as an assessment tool for ongoing liquidity management over 2,718 companies for the period from 1974 through 1993. Based on the Pearson correlation and regression analysis, it is realized that FSIZE and profitability is negatively related to CCC.

Kim et al., (1998) studied the consequents of firm's liquidity based on the both theoretical and empirical investigation aspects. The data has collected from Compustat yearly report for 915 industrial companies over the period 1975 through 1994 in the USA. The results demonstrate that there is an inverse significant association among the CCC and SGROWTH.

Appuhami (2008) investigated how do companies' CAPEX effect on their WCM by utilizing multiple regression analysis on financial data of 416 firms that named in Thailand Stock Exchange over the period 2000-2005. He found that CAPEX and operating CF have a significant negative association with WCM. However, the result of his study shows a positive association among LEV and SGROWTH.

Baños-Caballero et al., (2009) investigated the influence of market weakness on WCM in Spain. The sample of their study includes 60 non-financial firms and the data retrieved from Spain Stock Exchange (SSE) over the period of 1997 through 2004. They found that SGROWTH, FSIZE, LEV and ROE have a negative impact on NTC

which used as a gauge of WCM and only SGROWTH and FSIZE impact significantly on that. They also demonstrated that NTC significantly positively influences by internal fund and positively affects by GDP. In their research, panel data were used as a primary estimation method.

In another study, Baños-Caballero et al., (2010) investigated the components of CCC in SME companies by utilizing panel data of 4,076 non-financial Spanish SMEs over the period 2001 to 2005. The result of their study demonstrated that LEV, SGROWTH and ROA have an inverse association with CCC. They also found that there is no relation between GDP and CCC.

Valipour et al., (2012) aimed to examine the influence of company's specifications such as profitability, operating CF, FSIZE on the WCM by using multiple regressions and Pearson's correlation analysis over the data of 83 Iranian firms named in Tehran Stock Exchange over the period 2001-2010. Their results displayed an inverse significant association among profitability, FSIZE, SGROWTH with CCC and an insignificant negative association among operating CF and CCC.

Mathuva (2014) investigated impact of internal and external factors on CCC in 33 non-financial firms that traded on NSE during the period 1993 through 2008 in Kenya. For achieving this end, the researcher has used OLS and fixed effects model. His findings showed that firm age, internal fund (CF) and INF influence significantly positively on CCC. He also found that CCC significantly inversely affected by ROA, CAPEX, SGROWTH and there is an insignificant association with FSIZE.

Yasir et al., (2014) explored the association between CCC and Cement company performance by exerting correlation and regression analysis on financial data of 16 Cement companies that retrieved from All Pakistan Cement Manufactures Association (APCMA) from 2007 to 2012. The outcomes of their study indicated that CCC is inversely related to profitability of the company.

Table 2 depict the summary of the results in which research that found the relationship between CCC and other factors that mentioned in this part.

Table 2: Summary of CCC and other related literatures

<i>Researchers</i>	<i>Independent variables</i>	<i>Findings: coefficient sign</i>
Besley and Meyer (1987)	ROE	+ significant
	INF	No relationship
Moss and Stine (1993)	CF	-
	FSIZE	-
Jose et al., (1996)	FSIZE	-
	ROE	-
Kim et al., (1998)	SGROWTH	- significant
Appuhami (2008)	CF	- significant
	CAPEX	- significant
Baños-Caballero et al., (2009)	CF	+ significant
	FSIZE	- significant
	SGROWTH	- significant
	LEV	-
	ROE	-
Baños-Caballero et al., (2010)	GDP	+
	SGROWTH	-
	LEV	-
	ROA	-
Valipour et al., (2012)	GDP	No relationship
	CF	No relationship
	FSIZE	- significant
	Profitability	- significant
Mathuva (2014)	SGROWTH	- significant
	CF	+ significant
	CAPEX	- significant
	FSIZE	No relationship
	ROA	- significant
Yasir et al., (2014)	SGROWTH	- significant
	INF	+ significant
Yasir et al., (2014)	Profitability	- significant

As a result, the following factors are determinants which influence on WCM which exerted in previous scholars:

2.4.1 Dependent Variable

2.4.1.1 CCC

In this study CCC has been exerted as a comprehensive gauge of WCM. As maintained by Jose, Lancaster and Stevens (1996) CCC is the most appropriate measure for WCM. Likewise, the CCC measure is a well-used standard in many researches (e.g. Deloof, 2003; Kieschnick, Laplante, & Moussawi, 2006; Teruel & Solano, 2007; Raheman & Nasr, 2007; Zariyawati, Taufiq, Annuar, & Sazali, 2010; Mansoori & Muhammad, 2012; Wasiuzzaman & Arumugam, 2013; Yenice, 2015). CCC was developed as part of operating cycle by Gitman (1997) and it is calculated by subtracting accounts payables from the addition of inventory period and accounts receivables period. Thus, CCC is computed as follows: $CCC = OSI + OSO - DPO$ (Iftikhar, 2013).

Inventory levels, payables and receivables are factors on which CCC is dependent and ought to shorter for efficient WCM (Yunos, Nazaruddin, Ghapar, Ahmad, & Zakaria, 2015). The CCC is the liquidity venture measurement which takes over period it takes a company if it rises capital in resources such as inventories to rise its vending level to be starved of holding. The emphasis of exerting the CCC as an encyclopedic WCM measurement in anticipating a company's prosperity (or fail) is proven by Johnson and Soenen (2003). Research has shown that over or under investment in the CCC bares much effect on the firm's wealth. Therefore, it appears that there are some characteristics of company that regulate the CCC periods. Because firms need to fund its operations over this time span, longer CCC leads to greater WC and contrariwise. Longer CCC could lessen the risk of stock-outs as well as increasing sales, and as a result could rise profitability (Lyngstadaas & Berg, 2016). Precisely, the CCC is likely

to be impressed by firm's internal resources, firm sustainability, external borrowing, investment level in fixed funds and other economic conditions.

2.4.2 Explanatory Variable

2.4.2.1 Profitability (ROE)

Chiou et al. (2006) as well as Uyar (2009) found that a company returns considerably determine the WCM and also suggested that the goal of efficient WCM is to create a balance between risk and profitability. Different views exist for the relationship between WC and ROE. Chiou et al. (2006) said that ROE and WCM have mutual influence. In addition, Uyar (2009) established a positive relationship between them. Firms that perform better and tend to adopt less rigorous WC policies leading to more accounts receivable and inventories are the explanations for the positive relationship between ROE and WC. Profitability of many firms have been measured by using the ROE according to many scholars (Yucel & Kurt, 2002; Anser & Malik, 2013; Panigrahi, 2013; Bhutto et al., 2015).

2.4.2.2 FSIZE

For the following reasons, FSIZE might influence WCM. First, according to Deloof (2003), FSIZE greatly determines its ability to acquire debt (and the amount of debt it acquires). In the study which is conducted by Chiou et al., (2006) it is noticeable that capital to invest in CA reduce by FSIZE, indicating that WCM increases by FSIZE. Second, big companies have more bargaining power than smaller ones as a result; they are able to negotiate for more appropriate credit with their providers. An enhancement in FSIZE eventuates in enhancement in firm's operating activities which in turn give increase the greater need of WC. Thus, FSIZE and CCC are positively associated. In terms of both sales and asset, Uyar (2009) interestingly found an inverse connection among FSIZE and CCC.

2.4.2.3 SGROWTH

Another possible determinant of the WCM is the SGROWTH. Deloof (2003) argued that higher sales usually will follow a higher level of inventory. Higher level of sales means reduced inventories, reduced inventories leads to shorter CCC which eventually improves profitability. Kieschnick et al. (2006) claimed that there is a positive association among the CCC and SGROWTH. As a result, firms with high SGROWTH experience complications in getting access to different finance types other than business finance which in turn contributes to a smaller CCC. As observed by Hill et al. (2010) the connection among SGROWTH and WC investment can suffer such a problem as long as WC investment actually influences SGROWTH. SGROWTH can be stimulated by liberal credit and inventory policies and it might also prompt the firm to invest in more WC (Kwenda & Holden, 2014).

2.4.2.4 LEV

In order to watch the volume of obligation used and the amount of outside fund the firm utilized, LEV was a critical variable which exerted as a part of this exploration (Khan, Rasheed, Ahmed, & Rizwan, 2016). There are a number of ways that an organization can accomplish LEV by utilizing getting store, purchasing the settled resource and the more use of subordinates (Akinlo & Olufisayo, 2011). The lower the LEV of a company, the lower the cost of funds used in financing WC and the longer the CCC. Preceding investigations show that WCM of firms increases their reputation (Kieschnick, Laplante, & Moussawi, 2006). Therefore, it is not the easiest task to examine the connection between LEV and WCM. Ratio of obligation to all out resources was in helpful in determining LEV.

2.4.2.5 CF

The volume of the funds which invested in WC is essentially as a result of the internal resource generating capability of the firm. The more the ability to create endogenous resources, the more the firm invests in CA and firms with more CFs have longer CCC. Chiou et al. (2006) established that companies through more CFs accomplish their WC better proficiently. According to Myers and Majluf (1984) that introduced Pecking order theory proves that companies focus on their sources of financing from internal financing to equity since internal sources are more affordable than other finance substitutions. Therefore, WCM would be subjective to the CF and firms with higher level of CF can have more investment in WCM. Firms with more CF possess more WC due to larger internal resources could be finance in WC which allows them to have larger amount of CA (Mansoori & Muhammad, 2012).

2.4.2.6 CAPEX

CAPEX incorporates expenses caused by companies for procurement and overhauling physical resources, for instance, land, structures, hardware, vehicles, and equipment's (Appuhami, 2008). During the economic life cycle of the assets, CAPEX are added to them and deteriorated against benefits. On the other hand, CAPEX can be defined as the money that invest in fixed assets (Baños-Caballero et al., 2010; Mansoori & Muhammad, 2012). According to Appuhami (2008), administrators give careful consideration to objective about CAPEX, meanwhile they are excessively expensive as well as irremovable. Thus, companies in order to manage financial restrictions attempt to diminish the money that want to invest in WC.

2.4.2.7 GDP and INF

The WCM is also impacted by the macroeconomic cycle such as GDP and INF (Lyngstadaas & Berg, 2016). For example, companies might have trouble receiving

external financing for their operating activities during recessions which might likewise rise the inventory (Chiou et al., 2006), which may be because they are unable sell their goods. A firm's level of WCM is influenced by the country's economy although it's tough to hypothesize the direction of the influence. An economic recession diminishes the capability to turn over CA to make sales, bring about huge CA holdings. Zariyawati et al. (2010) in their research on Malaysia, stated that Malaysian companies' investment in WC rose by healthy economic conditions.

2.5 Hypotheses and Conceptual Model

Based on the above literature reviews it has been determined that CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP and INF influence WCM. The pervious literature reviews also demonstrated that the impact of these factors on WCM is inconclusive. In this case, the following hypotheses have been proposed for the impact of each explanatory variable on the respond based upon the majority results of these study:

H₁: CF has significant negative influence on WCM

H₂: CAPEX has an inverse significant influence on WCM

H₃: FSIZE has an inverse significant influence on WCM

H₄: SGROWTH has a positive influence on WCM

H₅: LEV has a positive influence on WCM

H₆: ROE has an inverse significant influence on WCM

H₇: GDP has a positive significant influence on WCM

H₈: INF has significant negative impact on WCM

Consequently, based on the preceding scholars that mentioned and the hypotheses the following conceptual model is proposed:

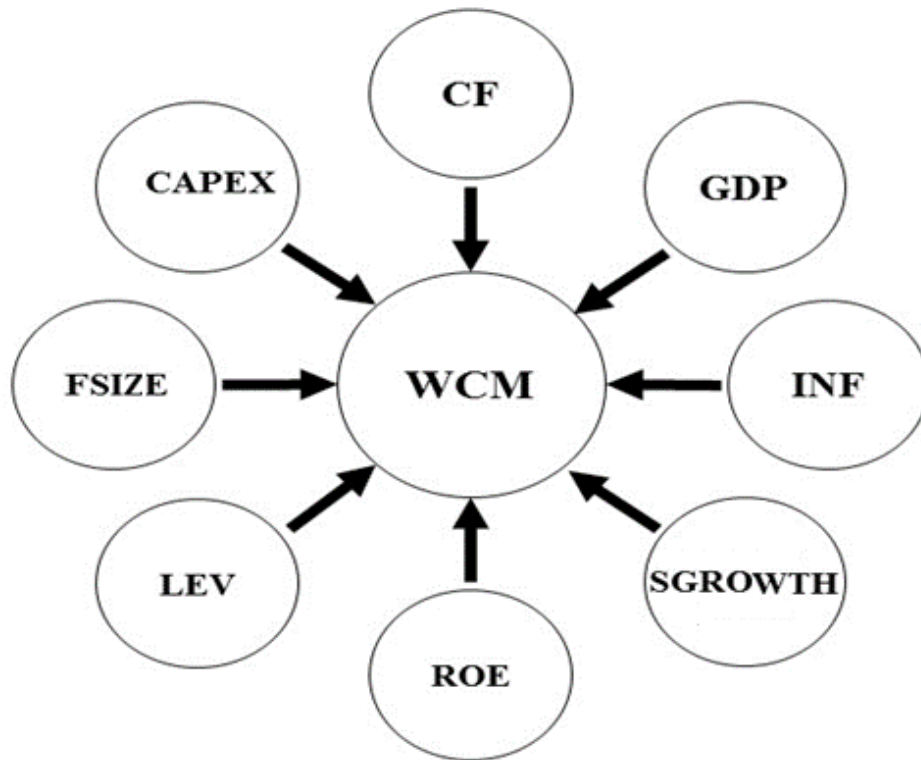


Figure 2: Conceptual model, retrieved from Chiou et al., 2006; Kieschnick et al., 2006; Nazir & Afza, 2009; Zariyawati et al., 2010; Mansoori & Muhammad, 2012; Palombini & Nakamura, 2012; Mohamad & Elias, 2013; Mongrut et al., 2014.

Chapter 3

METHODOLOGY

3.1 Case study: Chinese electronic industry

According to World Bank annual report for 2015, since initiating market reforms in 1978, China has shifted from a centrally-planned to a market-based economy and has experienced rapid economic and social development. GDP growth has averaged nearly 10 percent a year—the fastest sustained expansion by a major economy in history—and has lifted more than 800 million people out of poverty. With a population of 1.3 billion, China recently became the second largest economy and is increasingly playing an important and influential role in the global economy.

According to Zhao et al., (2007) China has become the biggest exporter of electronic products in the world. China's electronics industry has been growing explosively since the 1990s and has gained increasing significance in world trade. After joining the World Trade Organization (WTO) in late 2001, many multinational enterprises that produced electronic equipment and devices, such as PCs and mobile phones, set up new factories in China (IBISWORLD, Feb 2016). In 2004, China surpassed the USA to become the biggest exporter of electronic products. In 2005, China became the second largest producer of electronic products in the world. Since 2009, the largest electronic products producer is China by 25% of the world electronic export (UNCTAD, 2016).

3.2 Data Collection

The sample of this thesis retrieved from DataStream which is one of the best database of global financial and macroeconomic data that includes data from financial statements of world companies. To achieve the end of this study, 289 Chinese companies which operate in electronic industry over the period of 2004 through 2015 have been chosen. Furthermore, lack of data for some firms and some periods cause to omit 191 firms and alter the period to 2005-2014. Finally, the sample consists of 98 Chinese Electronic companies for the period from 2005 to 2014. (980 firms-years observation).

3.3 Measurement of Variables

In this study as dependent variable, CCC that represents WCM has been used. On the other hand, CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP and INF have been devoted as independent variables. All of the variables that are mentioned, are subjected to the balance sheet as well as profit and loss account.

The following table (Table 3) demonstrates different variables which have been exerted in this study. The first column shows the variable name, the second depicts the abbreviation which used for each variable, the third illustrates that how is each variable calculated and the fourth one represents references for each variable.

Table 3: Summary of the variables

Variable Name	Abbreviation	Calculation	References
Cash Conversion Cycle	CCC	$[(AR/Sales)+(Inventories/COGS)+(AP/COGS)]*365$	(Deloof, 2003)
Cash Flow	CF	Ratio of EBIT and depreciation to sales	(Kim et al.,1998)
Capital Expenditure	CAPEX	Tangible fixed assets to the value of its total assets	(Appuhami, 2008)
Firm Size	FSIZE	Natural log of sales revenue	(Deloof, 2003)
Sales Growth	SGROWTH	Change in sales scaled by last year's sales	(Chiou et al., 2006)
Leverage	LEV	Total debt to assets ratio.	(Nazir & Afza , 2009)
Return on Equity	ROE	Net income / Shareholders equity	(Jose et al, 1996)
Gross Domestic Products growth rate	GDP	Change in GDP scaled by last year's GDP	(Nazir & Afza, 2009)
Annual Inflation Rate	INF	Based on IMF annual report	(Zariyawati et al, 2010)

3.4 Model Specification

In this study nine variables have been chosen to determine the factors that influence WCM for Chinese firms which operate in the electronic industry consist of endogenous and exogenous variables. As mentioned earlier, CCC as the dependent variable and CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP and INF as independent variables have been exerted. The model of this thesis is as follow:

$$CCC_{it} = \beta_1 + \beta_2 CF_{it} + \beta_3 CAPEX_{it} + \beta_4 FSIZE_{it} + \beta_5 SGROWTH_{it} + \beta_6 LEV_{it} + \beta_7 ROE_{it} + \beta_8 GDP_{it} + \beta_9 INF_{it} + \varepsilon_{it}$$

Where i from 1 to 98 refers to firms, t refers to years from 2005 to 2014, CCC is cash conversion cycle, CF is cash flow, CAPEX is capital expenditure, FSIZE is firm size, SGROWTH is sales growth, LEV is leverage, ROE is return on equity, GDP is gross domestic product growth rate, INF is annual inflation rate and ε is residual error.

3.5 Data Analyses

In this study, first of all descriptive statistics has been used. After that, correlation analysis has been conducted to see correlation among variables. Finally, regression analysis has been exerted in order to test the hypotheses.

3.5.1 Descriptive Analysis

According to the balance sheet and income statement, all variables are calculated. This analysis introduces an overall glance of variables which contains average, minimum, maximum and standard deviation of them.

3.5.2 Regression Analysis

As it mentioned before, the model of this thesis is linear model. To investigate the linear equation, author with the possession of a set of statistical information on dependent and independent variables is tried to estimate parameters (Weisberg, 2005, p. 36). Obviously, it will be very easy to find value of parameters if there is no error ($u_i = 0$). However, issues are rarely so simple, because there is always the error term (u) for the following reasons:

- 1- Substitution for all the omitted variables from the model (Brooks, 2014, p. 78).
- 2- Errors due to measurement (Measure the dependent variable and independent variable) (Gujarati & Porter, 2009, p. 56).
- 3- Limitations inherent randomness of the dependent variable (Gujarati & Porter, 2009, p. 57).

Therefore, the exact mathematical solution is beyond reach and thus the parameters must be estimated (Brooks, 2014, p. 41). There are several methods for parameter estimation (β_i). In this thesis OLS, fixed and random effects model have been exerted.

3.5.2.1 OLS

A German mathematician of the 18th century Carl Friedrich Gauss invented the OLS, a technique for assessing parameters (Deakin, 2015). The basis of OLS is to draw points related to collected sample in the coordinate plane first and then the line pass through the minimum distance point to be with these points (with a specific criteria), according to Gujarati & Porter (2009, p.61). The remaining sum of squares in this estimation, which is the total square of the distance to at least be fit line (Brooks, 2014, p. 85).

3.5.2.2 Fixed Effects Model

This estimation method tried to examine the exact contrast in the intercept (Greene, Han, & Schmidt, 2002). The examination of the exact contrast in the intercepts is carried out by allowing each individual to have its own cut off value. Whilst the intercept value may differ across entities, the term “fixed effect” shows that the slope coefficients are not different across individuals. Besides, the individual specific effect is constant over period which means that the time invariant and there is a connection between the error component and other regressors (Wang & Ho, 2010).

3.5.2.3 Random Effects Model

Another estimation model which is called the random effects calculates the error variance to sets or times and presume that no connection exists between the individual effect and any variables as dependents. Regressors intercept and slopes are the same across individuals in this approach and the variation among individuals or time difference are presented in the individual explicit error, not in the intercepts. That is

why generally, error components model is attached to the random effect model as the other name (Brooks, 2014, p. 536). The number of parameters estimated will be lessened by random effect model but these estimations are inconsistent once the individual specific random effects match with the regressors (Greene H. , 2008, p. 201).

3.5.2.4 Hausman Test

Apparently, it is required to take care of the nature of the unobserved individual effect to examine the fixed or random effects model which is more suitable and significant for the study framework (Ahn & Low, 1996). As a result, the model specified test in econometrics proposed by Hausman (1978) which is widely used by many researchers to figure out both the theoretical and statistical basis in selecting between the fixed and random effects model is the Hausman test.

Chapter 4

EMPIRICAL RESULTS

4.1 Descriptive Analysis

An explanation of the variables for the average of the variables used in describing the connection between variables is given in this section. Moreover, the minimum and maximum values of the variables are presented. The table below (Table 4) contains results which make it easy to interpret and understand from the analysis.

Table 4: Descriptive statistics

	Observations	Mean	Minimum	Maximum	Std. Dev.
<i>CCC</i>	980	306.190	-4203.000	29289.000	1374.787
<i>CF</i>	980	0.000	-2.000	3.000	0.136
<i>CAPEX</i>	980	0.090	0.000	1.000	0.283
<i>FSIZE</i>	980	13.740	3.000	17.000	1.382
<i>SGROWTH</i>	980	-1.610	-1107.000	1.000	35.865
<i>LEV</i>	980	0.060	0.000	7.000	0.325
<i>ROE</i>	980	0.207	-5.119	138.932	4.475
<i>GDP</i>	980	9.991	7.269	14.195	2.144
<i>INF</i>	980	4.387	-0.107	8.139	2.933

980 observations were exerted in this thesis for all the variables in the finding above. It is obvious that CCC is differ between companies from -4203 through 29289 days which might be linked to the size of the companies which means that larger firms take longer CCC. CF variation is between -2 to 3 with zero average and 0.136 standard deviation. CAPEX is a percentage measure of tangible fixed over total asset and it is between 0 to 1 (0%- 100%) with the average 9%. The standard deviation of the

CAPEX is a respond to the difference among firms. The FSIZE depicts the variation between firms from 3 through 17 which means that this variable is very different between companies. The average value of FSIZE is about 13 which shows that the majority of the companies are closer to high value, that is, the number of big firms are more than smaller one. SGROWTH demonstrates that its value is between -1107 to 1 with -1.61 as an average. This result depicts that SGROWTH of major of these firms are negative. The LEV of Chinese firms which operate in electronic industry is between 0 to 7 with the 0.325 standard deviation. The average value of the LEV is also 0.06 which depicts that the LEV level of the firms is closer to zero. The average of ROE (profitability) is 0.207. The minimum level of this variable is -5.119 and the maximum value of it is 138.932. GDP of the China shows that the maximum value of it is for 2007 and the minimum value of GDP is related to 2014. The average value of the GDP is 10 which makes evident that between 2005 through 2014 in the most years GDP is closed to the mean value. Furthermore, the INF of China is single-digit and even lower than 8.139 which is for year 2011. The minimum level of this variable is -0.107 in 2009.

4.2 Correlation Analysis

This examination is done to investigate the correlation among the variables which are CCC, CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP and INF. Pearson correlation coefficients are calculated to study the connection among these variables as shown in the Table 5.

Table 5: Pearson Correlation Matrix

	<i>CCC</i>	<i>CF</i>	<i>CAPEX</i>	<i>FSIZE</i>	<i>SGROWTH</i>	<i>LEV</i>	<i>ROE</i>	<i>GDP</i>	<i>INF</i>
<i>CCC</i>	1.000								
<i>CF</i>	0.009 (0.773)	1.000							
<i>CAPEX</i>	-0.048 (0.130)	-0.049 (0.129)	1.000						
<i>FSIZE</i>	-0.319 (0.000)***	-0.014 (0.668)	-0.104 (0.001)***	1.000					
<i>SGROWTH</i>	-0.048 (0.133)	0.001 (0.970)	-0.114 (0.000)***	0.226 (0.000)***	1.000				
<i>LEV</i>	-0.046 (0.154)	-0.252 (0.000)***	0.098 (0.002)***	-0.081 (0.011)**	-0.090 (0.005)***	1.000			
<i>ROE</i>	-0.009 (0.780)	0.016 (0.623)	-0.009 (0.777)	-0.021 (0.504)	0.000 (0.989)	-0.003 (0.918)	1.000		
<i>GDP</i>	-0.035 (0.270)	0.006 (0.849)	-0.022 (0.493)	-0.163 (0.000)***	-0.420 (0.186)	-0.059 (0.067)*	0.068 (0.033)**	1.000	
<i>INF</i>	0.005 (0.885)	0.016 (0.612)	0.005 (0.884)	-0.069 (0.032)**	0.003 (0.924)	-0.022 (0.500)	0.038 (0.229)	0.532 (0.000)***	1.000

Note: ***Significant at 1%, **Significant at 5%, *Significant at 10 %.

The result of the correlation matrix demonstrates that the connection between CCC as dependent variables with independents variable is not substantial and less than 32%. CAPEX, FSIZE, SGROWTH, LEV, ROE, and GDP have negative association with CCC. On the other hand, the correlation between CCC with CF and INF is positive but not remarkable. The highest connection is between GDP and INF which is 53%. CF with other independent variables have both negative and positive connection in which with CAPEX, FSIZE, and LEV have negative association and with SGROWTH, ROE, GDP, and INF have positive nexus. The linkage between CF with SGROWTH and GDP is less than 1%. CAPEX have negative nexus with FSIZE, SGROWTH, ROE, and GDP and have positive relationship with LEV and INF. FSIZE has positive nexus only with SGROWTH which is reasonable and with other variables have negative association. There is no correlation between SGROWTH and ROE. SGROWTH have negative nexus with LEV and GDP and positive but very small nexus with INF. The next variable is LEV which have negative association with ROE, GDP and INF. On the other hand, there is positive correlation between ROE with GDP and INF. The latest variable is GDP which has positive correlation with INF.

4.3 Multicollinearity

The nexus between independent variables is the sign of multicollinearity problem. For investigation whether there is multicollinearity problem between explanatory variables or not, tolerance and variance inflation factor (VIF) have been exerted. The table below (Table 6) depicts the results of these tests.

Table 6: Multicollinearity

	Tolerance	VIF
CF	0.867	1.153
CAPEX	0.965	1.036
FSIZE	0.719	1.39
SGROWTH	0.923	1.083
LEV	0.911	1.098
ROE	0.644	1.552
GDP	0.69	1.449
INF	0.715	1.399

In the most cases, the VIF is used in the regression analysis to determine the extent of multicollinearity of an explanatory variable through the other explanatory variables, quantifying the level of multicollinearity. It determines the level of growth in variance of an estimated regression coefficient as a result of collinearity and for tolerance it is reversed (Gujarati & Porter, 2009, p. 340). According to Kutner, Nachtsheim, and Neter (2005;p. 409), if the VIF exceed 10 or tolerance surpass 1, there is a sign of multicollinearity. As it is shown in the Table 6, VIF for all variables are around one. On the other hand, tolerance for all variables are less than 1 which show that there is no multicollinearity problem.

4.4 OLS Results

Table 7 depicts the results of OLS regression model to identify the association among dependent and independent variables. According to t-test table, the critical values for interval confidence at level 90%, 95%, and 99% are respectively 1.645, 1.96, and 2.576 (Gujarati & Porter, 2009, p. 879).

Table 7: OLS (CCC is dependent variable)

<i>Variable</i>	<i>Coefficient</i>	<i>t-test</i>	<i>Prob-value</i>
<i>CF</i>	-330.399	-1.21	0.228
<i>CAPEX</i>	-1388.736	-5.17	0.000***
<i>FSIZE</i>	-368.438	-11.61	0.000***
<i>SGROWTH</i>	0.191	0.16	0.871
<i>LEV</i>	-364.894	-2.52	0.012**
<i>ROE</i>	-2.650	-0.29	0.772
<i>GDP</i>	-73.263	-3.22	0.001***
<i>INF</i>	21.082	1.28	0.200
<i>Constant</i>	6486.913	12.50	0.000***
<hr/>			
R ²	0.148	F-statistic	59.07853
Adjusted- R ²	0.141	Prob(F-statistic)	37.58840
# of observations	980		

Note: ***Significant at 1%, **Significant at 5%, *Significant at 10 %.

Based on the above table, the author makes following equation to make interpretation in easier way.

The equation is:

$$CCC_{it} = 6486.913 - 330.399 CF_{it} - 1388.736 CAPEX_{it} - 368.438 FSIZE_{it} + 0.191 SGROWTH_{it} - 364.894 LEV_{it} - 2.65 ROE_{it} - 73.263 GDP_{it} + 21.082 INF_{it} + \varepsilon_{it}$$

The result of this estimation depicts that half of the independent variables are not significant which means that the relationship of them with dependent variable are ambiguous. These variables consist of CF, SGROWTH, ROE, and INF. Therefore, the correct equation is as follow:

$$CCC_{it} = 6486.913 - 1388.736 CAPEX_{it} - 368.438 FSIZE_{it} - 364.894 LEV_{it} - 73.263 GDP_{it} + \varepsilon_{it}$$

This equation demonstrates the negative association between CCC and CAPEX. Therefore, if CAPEX increases by one percent, CCC will decrease by 1388.736 days. Similarly, there is a negative nexus between CCC and FSIZE which shows that larger

firms have shorter CCC. If FSIZE increases by one percent, then CCC will decrease by 368.438 days. Likewise, there is an inverse association among CCC and LEV. Thus, if LEV increases by one percent, CCC will diminish by 364.894 days. Likewise, the association between CCC and GDP is reversely. Thus, if GDP rises by one percent the CCC will reduce by 73.263 days.

4.5 Fixed Effects Results

Table 8 presents the fixed effects estimation model to analyze the connection between CCC and explanatory variables which are CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP, and INF.

Table 8: Fixed effects model (CCC is dependent variable)

<i>Variable</i>	<i>Coefficient</i>	<i>t-test</i>	<i>Prob-value</i>
<i>CF</i>	-36.889	-0.16	0.874
<i>CAPEX</i>	-942.786	-2.27	0.024**
<i>FSIZE</i>	-276.782	-5.29	0.000***
<i>SGROWTH</i>	-0.144	-0.14	0.889
<i>LEV</i>	-233.967	-1.54	0.124
<i>ROE</i>	7.901	0.99	0.332
<i>GDP</i>	-65.356	-3.47	0.001***
<i>INF</i>	19.194	1.47	0.142
<i>Constant</i>	4986.888	6.15	0.000***
<i>R²</i>	0.148	<i>F-statistic</i>	59.07853
<i># of observations</i>	980	<i>Prob(F-statistic)</i>	37.58840

Note: ***Significant at 1%, **Significant at 5%, *Significant at 10 %.

Based on the fixed effects estimation model, the incipient equation is as follow:

$$CCC_{it} = 4986.888 - 36.889 CF_{it} - 942.786 CAPEX_{it} - 276.782 FSIZE_{it} - 0.144 SGROWTH_{it} - 233.967 LEV_{it} - 7.901 ROE_{it} - 65.356 GDP_{it} + 19.194 INF_{it} + \varepsilon_{it}$$

The results of the fixed effects demonstrate that CF, SGROWTH, LEV, ROE, and INF have not significant nexus with CCC which means that the association between CCC

and these explanatory variables are ambiguous. Therefore, the modified equation is as follow:

$$CCC_{it} = 4986.888 - 942.786 CAPEX_{it} - 276.782 FSIZE_{it} - 65.356 GDP_{it} + \varepsilon_{it}$$

This equation demonstrates that the connection between CCC with CAPEX, FSIZE, and GDP is negatively significant. If CAPEX increases by one percent, the CCC will diminish by 942.786 days. Thus, firms with higher level of CAPEX have shorter CCC. Likewise, if FSIZE increases by one percent, the CCC will decrease by 276.782 days. Therefore, large companies seem to have shorter CCC. Similarity, if GDP rises by one percent, the CCC will diminish by 65.356 days which means that GDP has reversely affect CCC.

4.6 Random Effects Results

Table 9 is the result of random effects estimation model to explore the nexus between CCC and independent variables.

Table 9: Random effects model (CCC is dependent variable)

<i>Variable</i>	<i>Coefficient</i>	<i>t-test</i>	<i>Prob-value</i>
<i>CF</i>	-93.431	-0.400	0.686
<i>CAPEX</i>	-1126.107	-3.230	0.001***
<i>FSIZE</i>	-316.252	-7.390	0.000***
<i>SGROWTH</i>	0.006	0.010	0.995
<i>LEV</i>	-277.440	-1.930	0.054*
<i>ROE</i>	6.543	0.840	0.402
<i>GDP</i>	-69.217	-3.730	0.000***
<i>INF</i>	19.806	1.510	0.130
<i>Constant</i>	5628.238	8.350	0.000***
<i>R²</i>	0.1462	Wald Chi2(10)	70.35
<i># of observations</i>	980	Prob(F-statistic)	37.5884

Note: ***Significant at 1%, **Significant at 5%, *Significant at 10 %.

According to the random effects estimation model, the initial equation is as follow:

$$CCC_{it} = 5628.238 - 93.431 CF_{it} - 1126.107 CAPEX_{it} - 316.252 FSIZE_{it} - 0.006 SGROWTH_{it} - 277.44 LEV_{it} + 6.543 ROE_{it} - 69.217 GDP_{it} + 19.806 INF_{it} + \varepsilon_{it}$$

The result of this estimation depicts that half of the independent variables are not significant which means that the relationship of them with dependent variable are vague. These variables consist of CF, SGROWTH, ROE, and INF. Therefore, the correct equation is as follow:

$$CCC_{it} = 5628.238 - 1126.107 CAPEX_{it} - 316.252 FSIZE_{it} - 277.44 LEV_{it} - 69.217 GDP_{it} + \varepsilon_{it}$$

The preceding equation indicates that the association between CCC with independent variables which consist of CAPEX, FSIZE, LEV, and GDP is reversely significant. Therefore, if CAPEX increases by one percent, CCC will decrease by 1126.107 days. On the other hand, if FSIZE rises by one percent, the CCC will diminish by 316.252 days. Likewise, if LEV increases by one percent, the CCC will diminish by 277.44 days.

4.7 The Comparison between Results

Table 10 shows the pooled OLS appraisals of CCC with different independent variables and dissect their connections. In addition, fixed and random effects estimation models are additionally complement.

Table 10: Comparison between OLS, Fixed and Random Effects

Dependent variable: CCC			
Independent variables	OLS	Fixed effects	Random effects
CF	-330.399 (0.228)	-36.889 (0.874)	-93.431 (0.686)
CAPEX	-1388.736*** (0.000)	-942.786** (0.024)	-1126.107*** (0.001)
FSIZE	-368.438* (0.000)	-276.782*** (0.000)	-316.252*** (0.000)
SGROWTH	0.191 (0.871)	-0.144 (0.889)	0.006 (0.995)
LEV	-364.894** (0.012)	-233.967 (0.124)	-277.440* (0.054)
ROE	-2.650 (0.772)	7.901 (0.332)	6.543 (0.402)
GDP	-73.263*** (0.001)	-65.356*** (0.001)	-69.217*** (0.000)
INF	21.082 (0.200)	19.194 (0.142)	19.806 (0.130)
Constant	6486.913*** (0.000)	4986.888*** (0.000)	5628.238*** (0.000)
R ²	0.148	0.1448	0.1462

Note: ***Significant at 1%, **Significant at 5%, *Significant at 10 %.

In the regard of the all these three regression models, half of the explanatory variables consist of CF, SGROWTH, ROE, and INF have not significant relationship with CCC. Therefore, it can be concluded that based on this research they do not have any effect on WCM. Furthermore, in the fixed effects model the LEV also is not significant. The sign of the nexus between dependent variable and other explanatory variables are same in these three estimation model and negative but the value of the coefficients is different.

Based on OLS and random effects model CAPEX has negative association with WCM at 1% significant level. Furthermore, fixed effects model also indicates that CAPEX is

negatively connected to WCM at 5% significant level. Once companies meet financial restrictions condition, its make a competition situation between WCM and fixed assets based on the existing financial repository. Consequently, companies endeavor to diminish investment in WC to come over on their financial restrictions due to this fact that altering fixed asset is too expensive.

Furthermore, according to three regression model FSIZE is negatively associated with WCM at 1% significant level. Thus, the result demonstrates that larger companies tried to minimize the CCC which means that they tend to manage WC effectively.

However, OLS and random effects model show that LEV has significant negative association with WCM respectively at 95% and 99% confidence level, fixed effects model demonstrates that there is no significant association amid LEV and WCM. It can be clarified that firms which have more debt simultaneously have more exterior checking from the debtors. Thus, they will guarantee that WC is administered appropriately.

In addition, based on the three regression models GDP is correspondingly negatively associated with WCM at 99% confidence level. It shows that firms should invest more during contracting economy condition and less during expanding economy condition in WC. Accordingly, the ascending in account receivables and inventory are accompanied with rising investment in WCM; nevertheless, without diminish in short term obligation because of promptly in contracting economic condition.

All three model have R^2 around 0.15, which signals that this model is able to explain only about 15% the effect of the chosen variables on cash conversion cycle. Even

though the model could have been more significant, a 0.15 R^2 value is good compared to previous studies in the area (e.g. Chiou et al., 2006; Nazir & Afza, 2009; Zariyawati et al., 2010).

4.8 Hausman Test

To examine whether fix effects model appropriate for this study or random effects, Hausman test has been applied. The following table (Table 11) depicts the result of this test.

Table 11: Hausman test

<i>Fixed/Random effects testing</i>	<i>Chi2(X^2)</i>	<i>Prob-value</i>
Hausman test	42.27	0.0000

Based on the Prob-value of this test which is zero, the null hypothesis can be rejected. Finding of Hausman test demonstrates that suitable estimation test for this thesis is the fixed effects model. Finally, based on the fixed effects model results CAPEX, FSIZE, and GDP have impact on WCM.

Based on this consideration, CAPEX has a negative significant influence on WCM at 5% level. Because of this reason, H2 is accepted. This is consistent with many preceding scholars (e.g. Appuhami, 2008; Mansoori & Muhammad, 2012; Mathuva, 2014) but is not consistent with some of the previous studies (e.g. Mohamad & Elias, 2013).

Similarity, FSIZE has a negative significant influence on WCM but at 1% level. Because of this reason, H3 is accepted. This is in accordance with many previous studies (e.g. Moss & Stine, 1993; Jose et al., 1996; Kieschnick et al., 2006; Baños-Caballero et al., 2009; Zariyawati et al., 2010; Mansoori & Muhammad, 2012; Palombini & Nakamura, 2012; Valipour et al., 2012; Mongrut et al., 2014) but is not

in accordance with some of the preceding scholars (e.g. Chiou et al., 2006; Nazir & Afza, 2009).

Likewise, GDP has a negative significant impact on WCM at 1% level of significant. Thus, H7 which depicts that there is a positive significant association among GDP and WCM, is rejected. This is consistent with some preceding scholars (e.g. Mansoori & Muhammad, 2012) but is not consistent with some previous literatures (e.g. Baños-Caballero et al., 2009; Zariyawati et al., 2010; Mohamad & Elias, 2013).

Chapter 5

CONCLUSION AND MANAGERIAL IMPLICATIONS

This thesis aims to explore empirically the factors that influence WCM in companies which operate in electronic industry in China. Based on the annual report of IMF about global economic, China is the second largest economy around the world (IMF, 2016). Although, managing of WC and determination the factors which affect WCM is essential for every companies, this topic has not considered in the second largest economy since now. With this respect, this thesis could be an interesting area for research about WCM in China.

98 firms from electronic industry in China have been chosen to investigate the factors which influence WCM during the period from 2005 through 2014. Furthermore, for the measuring the WCM CCC as dependent variable and CF, CAPEX, FSIZE, SGROWTH, LEV, ROE, GDP, and INF have been selected. Thus, to achieve the aim of the study, author has exerted OLS, fixed and random effects estimation models to determine the nexus among dependent and independent variables. In addition, Hausman test has been applied to determine fixed or random effects model is appropriate for this study and the result of this test declares that fixed effects is proper estimation model.

Variables consist of CF, SGROWTH, LEV, ROE, and INF have not significance connection with CCC which shows that the nexus of them with WCM is ambiguous.

On the other hand, remaining explanatory variables have significant nexus with CCC inversely.

Based on the finding of this study, the negative association between CAPEX and WCM demonstrates that the managers of these firms commensurate with the growth opportunities and increasing in CAPEX may need more liquidity and investment in short-term financing. Thus, they might be increase account payables period and to accelerate converting account receivables to cash to make sure that prerequisite to be WC will decrease. It could be recommended that companies in the face of growth opportunity should increase their CAPEX and ensure that they do not meet liquidity problem. Also, firms with growth opportunities could increase their account payables and account receivables period to ensure that the need of WC will decrease.

Based on this consideration, the negative relationship between FSIZE and WCM indicates as company getting bigger, CCC is been reduced. Because they are using tighter WCM practices. These firms may be very fast in collecting their receivables and they are able to extend their account payable period because they have more bargaining power to haggle with suppliers. Also, they may be excellent in converting their inventories to sales. Basically, in theory FSIZE should influence WCM positively because firms are more capable to finance this increasing in receivables, and inventories and these companies have less financial constraints. They also have better access to financial resources and by extending their receivables by paying their account payables in a shorter time. Because if they extend their receivables, then they will get the opportunity of increasing their sales. Also, by paying their account payables quickly, they will get the opportunity to get early discounts that leads to boost their profits. However, the finding of this study just demonstrate the opposite result.

Likewise, the result of this consideration indicates that GDP and WCM have an inversely relationship which demonstrates that more growth in GDP leads to shorter CCC period. Thus, GDP has positive impact on account receivables which means that by increasing GDP the amount of account receivables will increase. In addition, smaller firms more depend on short-term financing which may lead to more sensitive reaction with variation in GDP. Furthermore, smaller firms may be influenced by these changes more than bigger companies. Therefore, smaller firms may be face more expensive short-term financing rather than others.

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