

Determinants of Working Capital Management of Real Estate Sector Evidence from Saudi Arabia

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ABSTRACT

Working capital management refers to management of short-term capitals of the company at which includes the capital that companies are using in their daily operations. Moreover, management plays a vital role in maximization of shareholders wealth accordingly working capital management involves to major decisions regarding investment policy. To investigate the determinants of WCM, the panel data methodology has been employed that's the sample of nine real estate firms that are listed in Saudi stock exchange (Tadawul) over six years from 2010 to 2015 are considered.

OLS methodology implied to study the variation of the explanatory variables on the explained variable. The dependent variable of this study is cash conversion cycle which represents working capital management and the explanatory variables are profitability, size, sales growth, free cash flow and leverage.

Findings reports a significant and negative association between profitability, size and leverage, and cash conversion cycle however the effect of sales growth and free cash flow on cash conversion cycle found to be positive but significant for sales growth and insignificant for free cash flow.

Keywords: Working capital management, real estate firms, Saudi stock exchange (Tadawul). OLS.

ÖZ

Çalışma sermayesi yönetimi şirketlerin kısa vadeli günlük operasyonlarda kullandığı sermayelerin yönetimi anlamına gelir. Ayrıca, yönetim işletme sermayesi yönetimi, yatırım politikası ile ilgili önemli kararları içeren hissedarların gücünü maksimizasyonu gibi hayati bir rol oynar. İşletme Sermayesi Yönetimi belirleyicilerini araştırmak için panel veri yöntemi ile Suudi Arabistan Borsası'nda (Tedavül) 2010dan 2015e kadar listelenen örnek dokuz gayrimenkul firmaları göz önünde bulundurulmuştur.

EKK yöntemi tanımlanabilen veri ve tanımlanmış veri arasındaki bağı incelemektedir. Bu çalışmanın bağımlı değişkeni Nakit Dönüş Süreci olup sermaye yönetimini temsil etmektedir. Açıklayıcı değişken ise karlılık, boyut, satış büyümesi, serbest nakit akışı ve seviyeleri ile belirlemiştir.

Satış büyümesi ve nakit dönüş süresi boyunca serbest nakit akışı, serbest nakit akışı etkisi sonucu olumsuz ama satış büyümesi ve önemsiz, ama karlılık, büyüklük açısından önemli olduğu bulunmuştur, nakit dönüşümü ve seviyeleri arasında anlamlı ve pozitif bir ilişki raporlanmıştır.

Anahtar Kelimeler: Çalışma sermayesi yönetimi, gayrimenkul firmaları, Suudi borsa (Tedavül), EKK.

DEDICATION

To My Parents

ACKNOWLEDGMENT

First and always, I would thank my God (Allah) to the infinite graces. I would like to express my special appreciation and thanks to my supervisor Prof. Dr. Salih Katircioglu, You have been a tremendous mentor for me. I would like to thank You for encouraging my research and for allowing me to grow as a research scientist. Your advice on both research as well as on my career have been priceless, thanks to you a special thanks to my family. Words cannot express how grateful I am to my mother, father sister, brother and for all of the sacrifices that you've made on my behalf. Your prayer for me was what sustained me thus far. I would also like to express my special appreciation and thanks to my beloved friend Mr. Dlawar Hadi who supported me in writing, and incited me to strive towards my goal. At the end I would like to grateful who helped even once in my life.

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LIST OF ABBREVIATIONS

WCM	Working Capital Management
FCF	Free Cash Flow
GDP	Gross Domestic Product
DW	Durbin-Watson
GRTH	Growth
LVGE	Leverage
OLS	Ordinary Least Squared
ROA	Return on Assets
CCC	Cash Conservation Cycle
DIO	Days Inventory Outstanding
DSO	Days Sales Outstanding
DPO	Days Payable Outstanding
KSA	Kingdom of Saudi Arabia

Chapter 1

INTRODUCTION

1.1 Background of the Study

Despite the extreme falls in oil prices in 2015, Saudi Arabia is ranked as 20th greatest economy in the world. Saudi Arabia GDP is expected to fall by 1.5% in 2016. Moreover, Saudi government had a deficit of (90 billion USD) in 2016 budget which is equivalent to 15% of GDP (<http://www.jll-mena.com>). The significant decline in oil prices that had severe impacts on Saudi Arabia pushed the government to diversify the sources of financing government and economy such as facilitating foreign direct investment through affording facilities to attract foreign investors, an evidence for that is recent regulations that accordingly the foreigners allowed to obtain 100% ownership of properties (www.ey.com). Saudi Arabia considered as one of the largest real estate markets in MENA region that plays a substantial role in the economy of the country. The Jeddah chamber of commerce and industry estimates the value for real investment in the next few years as 400 billion USD and anticipated the market to grow by 5% (www.ey.com).

On the other hand, in respect of the real estate market, Klimczak (2010) in the study of the determinants of real estate investment argues that among the crucial factors that describing the current and future values of real estate is local authority policy and strategy, country's overall economy performance and the situation of real estate market. The author further argues that one of the most basic factors could attract the investors to invest in real estate is the location and it is the essential for investment

decision in a way that the good location expected to have a high income while the bad locations are more likely to generate a big lose.

1.2 Theoretical Background

Recent develops in corporate finance have shown the need for study in working capital management field and it became a very well-known topic, consequently, managers realize the benefits of well managed working capital. Kwenda and Holden (2014) propose that working capital management plays a vital role in maximization of shareholders wealth accordingly working capital management involves to major decisions regarding investment policy that is how much should the firm invest in the current assets and financing policy which deals with finding appropriate mix of short run and long run financing options.

Chiou, Cheng, and Wu (2006) state that WCM refers to management of short-term capitals of the company at which includes the capital that companies are using in their daily operations, namely they are current assets and current liabilities, the authors further argue that good managing working capital increases the company's well been in the market regarding the liquidity and the firm also acts in the favor for the shareholders values growth. Dhar and Paul (2010) present that working capital management from the CFOs perspective is simple and straightforward term of guaranteeing the ability of the firm to fund the difference between short term liabilities and assets, while in practice it has become one of the most considerable issue in the organization where the financial executives are struggling to identify the essential drivers and appropriate level of working capital. The major objective of the working capital management according is to maintain scales between liquidity and profitability during the management of day-to-day operations of business

concern (Atseye, Ugwu and Takon, 2015). Zeriyawati et al., (2010) suggest that the result of earlier studies about the determinants of working capital management are mixed because of different time interval lengths and variety in used variables, according to them determinants of working capitals divided into two kinds of factors; internal factors that refer to firm specific factors while external factors which refer to macroeconomic factors however managers should strongly consider both kinds of factors.

1.3 Motivations of the Study

Saudi Arabia is one of the biggest economies in the world at the same time it is the largest economy and real estate market in GCC. As it has been mentioned earlier, because of the oil prices decline Saudi Arabia is looking for substitute sources of financing and one of the concentrations in this respect is to attract as much as possible from foreign investors to the real estate market through offering facilities and incentives such as 100% ownership promotions. Despite the recent economy events, the real estate market has been always very dynamic and active in Saudi Arabia. Another factor that motivates to conduct the current study is the lack of similar topic, as it has been observed many researcher employed studies in the working capital management area but none of them concern the real estate sector in particular.

1.4 Research Question and Objectives

The current study attempt to answer a research question that addressed below:

- What are the significant determinants of working capital management in the Saudi Arabia real estate sector?

In this respect the objective of this study is to investigate the significant determinants of working capital management in real estate firms by examining the variables of the

study and finding the significance and impact of them through testing the hypotheses of the study that are:

1. H0: Profitability has not significant impact on WCM in Real Estate sector in KSA.
2. H0: Firm Size has not significant impact on WCM in Real Estate sector in KSA.
3. H0: Firm Growth Sale has not significant impact on WCM in Real Estate sector in KSA.
4. H0: Free Cash Flow has not significant impact on WCM in Real Estate sector in KSA.
5. H0: Leverage has not significant impact on WCM in Real Estate sector in KSA.

1.5 Scope of the Study

This study investigates the significant determinants of the WCM in the real estate sector. The investigation is limited to nine firms that are listed in the Saudi Stock Exchange (Tadawul) and the time horizon chosen from 2010 to 2015 that are out of any crisis or economic recession.

1.6 Data and Methodology

The current study follows panel data methodology. The data collected from nine real estate companies listed in the Saudi Stock Exchange (Tadawul) and examined over six years 2010-2015, the data fetched from World Scope and Thomson Reuters DataStream. Moreover, the dependent variable of the study is Cash Conversion Cycle and the independent variables are profitability, size, free cash flow, sale growth and leverage.

The statistics and econometric tools applied in this study include the descriptive statistics, correlation matrix, multicollinearity, autocorrelation, panel unit root test,

and finally OLS regression test. To conduct the tests above Microsoft Excel and E-views software have been used.

1.7 Narrative about Saudi Arabia Economy

Saudi Arabia is ranked as the 20th largest economy globally. Saudi Arabia is also the largest economy and the largest real estate in GCC. According to Jadwa Investment publication economy report the economy of Saudi Arabia is expected to continue to slow down in 2016 and then going up in 2017, as it has been exhibited in the table below:

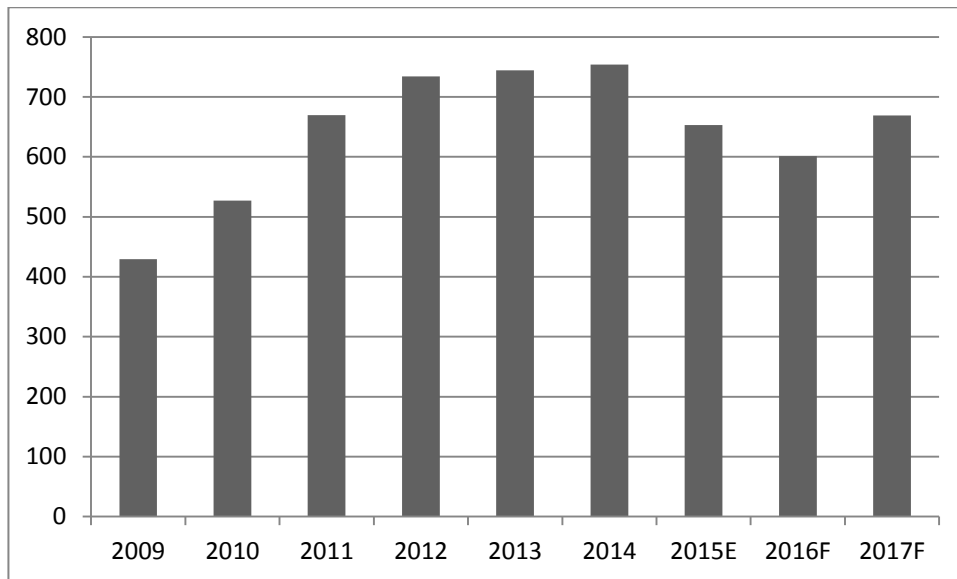


Figure 1.1: Saudi Arabia GDP. Source www.jadwa.com

Regardless continued falls in oil prices over the last year, Saudi GDP grew by more than 4% in 2015. GDP growth is however anticipated to slow down throughout 2016. The significant falls in the oil prices the affect the economy of Saudi Arabia extremely forces the country to look for an alternative source of financing the government and then diversify the sources, one of the sources was raising foreign direct investment and to attract investors to real estate market.

Focusing on real estate sector, the Jeddah Chamber of Commerce and Industry valued the KSA real estate market in 2014 at \$375 billion, the chamber expected the value to grow by 5-7% within the next few years reaching \$400 billion. The chamber further fosters that real estate market requires \$171 billion capital of investment to meet the demand by 2020, (www.ey.com).

1.8 Disposition

The following sections contain four chapters that are:

Chapter II: Literature Review and Theoretical Framework

Chapter III: Data and Methodology

Chapter IV: Empirical Findings

Chapter V: Conclusions

Chapter 2

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theatrical Review

2.1.1 Working Capital Management

Shin and Soenen (1998) define working capital management as the sequel of time lag between the expenditure for purchased raw materials and the collection of the sale of finished goods. On the other hand, Akinwande (2009) describes the net working capital as the distinction between current assets and current liabilities. hence, there are four main drivers of working capital management that are; cash management, account receivable management, Inventory management and account payable management. We will review all of them on by one in the following section. However, working capital management is the process to making decisions to determine the association between short term liabilities and short term assets.

Luo, and Lee and Hwang (2009) argue that with an effective working capital management companies can; ameliorate the liquidity of the firms, maximize firm's value the by having an optimal level of working capital demand, reduce the probability to have financial constrain, reduce the financial costs, and minimize the risk of bankruptcy.

2.1.2 The Drivers Working Capital Management

I. Cash Management

Padachi (2006) considers the necessity of cash flows to maintain business as a blood circulation for human's body to maintain life. Although cash doesn't generate profit directly, there are many factors that motivate the firms to hold it such as firms need a particular level of cash to manage daily transactions for instance to pay salaries, payments to the suppliers, or preventive motives that is to be prepared to the unpredicted events such as the raise in raw material prices, moreover, the reason for holding cash by the firms can be for speculative purpose to take the advantage of investment opportunity.

Banjerjee (2005) states that companies can benefit from holding cash only if it is in appropriate level, in other words holding excessive cash not make any sense in term of business since it can interest if it is used in proper investment. Similarly, García-Caballero, Teruel and Martinez-Solano (2011) in their research examined the impact of working capital management on the profitability of SMEs concluded that optimal level of cash can maximizes the firm's value.

II. Inventory Management

Inventory management comprises three components; raw materials, working in process inventory and finished inventory. However, the main objective of inventory management according to Damodaran (1997) is to have a considerable level of inventory and the motivations that encourage the companies to hold inventory are to ensure sustainable production, avoid shortage in raw materials and to have sufficient amount of produced goods that match the demand in any time.

III. Account Receivable Management

Account receivables are very important in business finance especially in developed countries at which account receivables exceed 25% of total assets of the firms. Despite the importance of the trade credits to customers, it is not free of risk; the customer may not payback the debt or default, this makes the firms to run the risk of bad debts. The second risk is time value money; the firms will lose the interest between time of sale of the goods and services and time of payment by the customer (Damodaran, 1997).

IV. Account Payable Management

Account Payables are the opposite side of account receivables. Companies purchase goods and services on credit, moreover, the good traits of account payables are; the company can reduce some investments in working capital management and maximization in account payable can generate the competitive advantage (Damodaran (1997). However, according to Gansean (2007) maximizing account payables influence the profitability inversely, in other words, firms may lose the opportunity to get discount from their vendors or to get bad quality of goods and services and then the relationship between suppliers and demanders can be ruin.

Merits of each component indicate that managers should not underestimate the significance of working capital management. WCM can be affected by firm's working capital management policy as well that is the policy of making investment by using current assets and current liabilities to finance the firm's assets. Basically, there are three types of working capital policies; first one is matching capital policy which aims to match current liabilities perfectly by using current assets while the second one is aggressive working capital policy that propose the companies should have as less as they can from account receivable and pay the account payables as late

as they can finally the third kind is conservative working capital policy that suggests firms must be sure their liabilities can be paid on time and they keep extra cash to avoid unpredicted circumstances (Kulkarni, 2011).

2.1.3 Measurement of WCM

The efficiency of WCM can be assessed by many ways while the common measure of WCM is Cash Conversion Cycle that has been used by [Mansoori and Muhammad (2012); Mongrut et al., (2014); Haron and Norman (2015); Naser et al., (2013); Zariyawati (2010)]. Mansoori and Muhammad (2012) point that

“CCC measures the number of days a firm’s sources is invested on the operations of business and as the sum of the Receivables Collection Period, plus the Inventory Conversion Period, minus the Payment Deferral Period. That is the shorter the cash conversion cycle the less time capital is tied up to the business process less opportunity cost, more efficiency in working capital management and better cash flows that lead to improvement in financial and operational process. The longer the cash conversion cycle associated with more opportunity cost and less efficiency in working capital management” Zariyawati (2010)]. Mansoori and Muhammad (2012).

2.1.4 Significant Determinants of WCM

Atseye (2015) proposes that many factors are affecting the effectiveness WCM such as business nature, business cycle and credit policy, seasonality and production policy, growth, raise in price level, operation efficiency, availability of raw materials, depreciation policy, dividend policy, taxation and retention policy etc. However, the current study aims to examine the impact of five variables on WCM as they will be reviewed in the following sections.

2.1.4.1 Profitability

For many years considerable efforts devoted to study the relationship between profitability and working capital management in various ways. Archavli, and Siriopoulos and Arvantis (2012) conclude that that there is statistically significant and negative association between profitability and WCM that’s the higher the profit

the shorter CCC. In a different studies, Ganesan (2007) and Haron and Norman (2015) could find the same result that the relation between profitability and working capital management is negative and significant. Similarly, Vural, and Sökmen and Çetenak (2012) examined the effect of WCM on the profitability of the manufacturing firms in Turkey, findings of their study reports inverse and significant relationship between the two variables.

Unlike the previous reviewed studies Mansoori and Muhammad (2012) argue that WCM and Profitability have a double-edge relationship and firms with longer cash conversion cycles are more affordable to expand trade credit to the suppliers and customer this implies that firms with higher profit have longer CCC. As the result of their study, they found a statistically significant and positive association between the two variables.

2.1.4.2 Size

In the study of determinants of WCM Zariyawati et al., (2010) investigated the impact of many variables on WCM of the listed corporates in Malaysia; their findings indicate negative and significant relationship between size and WCM. Likewise Naser et al., (2013) in the study of factors influencing corporate working capital management state that size negatively and significantly affect working capital management they further discuss that large firms tend to have shorter cash conversion cycle and have usually a higher turnover than smaller companies. The negative relationship between size and WCM is also confirmed by (Haron and Norman, 2015).

Like the previous studies Mangurut et al ., (2014) conducted a study that examined the size as a determinants of WCM in Latin America companies, the study deals with

a huge number of companies, they figured out that size and WCM are negatively related to each other. The authors demonstrate that their findings implies that large companies may have a good relationship with the suppliers and large companies in Latin America are subjected to less financial restrictions since they have a greater chance to access the financial markets with smaller cost of capital rather than small companies.

2.1.4.3 Sale Growth

Zeriyawati et al., (2010), examined the determinants of WCM and suggest negative and significant correlation between growth in terms of sale and working capital management, thus, an effective working capital management indicates that as sales growth increases the cash conversion cycle will decrease. Similarly, Naser et al., (2013) and Haron and Norman (2015) found a negative correlation between sales growth and WCM.

In another study, Mansoori and Muhammad (2012) argue that the prediction for future sales growth can cause to increase the amount of investment. Meanwhile, they reveal statistically significant and negative correlation between size and CCC.

2.1.4.4 Free Cash Flow

Jensen (1986) demonstrates that managers with a big amount of free cash flows are more likely to engage the firm with unnecessary expenses. According to the study, free cash flows define as the excess amounts of cash flow beyond the needed amount to finance all the current projects with positive returns subject to opportunity cost of capital. Similarly, according to McMahon (2006) in the organizations with low level of discipline and control over management activities, high level of free cash flows

may stimulate the managers to follow their own interests and consequently it generates negative return to shareholders.

In contrary of their expectation, Palombini and Nakamura (2012) found an inverse and statistically significant relationship between free cash flow and WCM.

2.1.4.5 Leverage

Palombini and Nakamura (2012) report negative relationship between debt ratio and working capital management and they argue that, the finding is consistent with pecking order theory that profitable companies are more likely to borrow less and prefer the internal financing. Naser et al., (2013) examined the factors impact corporate WCM, investigating listed non-financial firms in Abu Dhabi Security Exchange that operate in United Arab Emirates the result of their study indicates significant and positive relation between debt ratio and WCM accordingly the finding implies the sampled firms tend to have long CCC, have not enough liquidity and rely on external financing rather than internal financing. Likewise, Zariyawati et al., (2010) and Haron and Norman (2015) found that the impact of leverage on working capital management is negative and significant.

2.2 Empirical Literature in Economic and Real Estate Sector

An empirical study by Naceur, Cherif, and Kandil (2014) concerning the financial development of MENA countries state that:

“Apparently, the bulk of savings in MENA countries is absorbed outside the banking sector and the stock market. Various development indicators respond negatively to higher savings, implying that opportunities to mobilize savings in the real estate market and other physical assets appear more attractive than opportunities to invest in financial instruments”.

Furthermore, considerable amount of literature has been published on the relationship and effect of the economy on the real estate industry and vice versa.

Valadez (2011) investigated the relationship between housing prices and the economy in the USA by using real GDP as a function of housing price index, the finding proposes a significant relationship between the two variables that is change in housing prices may yield change in real GDP. Loyford and Moronge (2014), studied the effect of economic factors which include interest rate, transaction cost inflation and demand for housing on the performance of housing market in Kenya, the finding reveal high impact of the economic factors that are the area of the study on the housing industry in particular interest rate and inflation rate. Moreover, Chui and Chau (2005) examined the interaction between growth of economic, prices of real estate and real estate investments in Hong Kong, they state that real estate prices specifically office and residential prices were found to lead GDP growth in a way that the movements in real estate prices can be used to anticipate GDP growth. Likewise, detailed examination by Kong and Glascock, and Lu-Andrews (2016) showed that the real estate investment positive and significantly affect the economy growth the study also reveal a negative lagged influence of real estate investment on economy growth.

However, other studies have considered the relationship between real estate and economic cycle such as Quigley (1999), which concludes that clear economic fundamentals do not have any relationship with the variation of the property prices in the short run. Zhang et al., (2015) employed a quantitative about the real estate development and financial expenditure and economic growth in Fujian Province; the research results demonstrate that long-term steady balance among the variables in Fujian Province. Real estate development and financial expenditure are the Granger

factors driving the growth of economic growth. Financial expenditure is the Granger reason for real estate development's development.

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

Yin (2003) demonstrated that the research design is a substantial part of the research and its logic rather than logistic that assures the researchers that the collected data have a reasonable link with research initial questions and assumptions. As mentioned earlier the current study is implemented to achieve one specific goal, in this respect the design of the thesis intended to achieve the objective is to investigate the variation and impact of the chosen firms specific factors on the WCM of Saudi Arabia real estate firms.

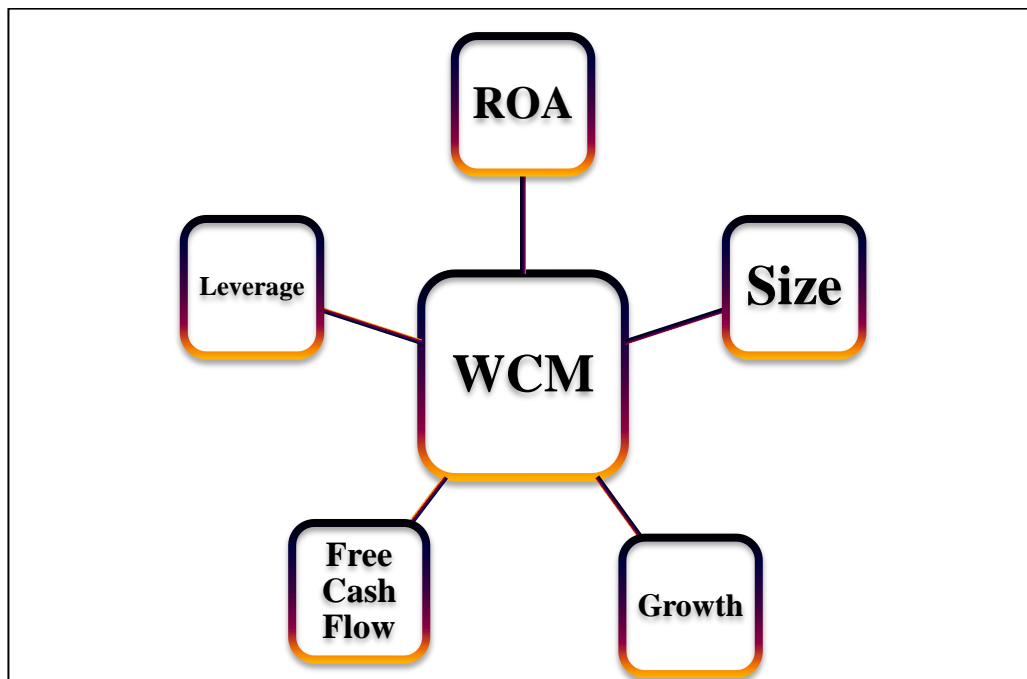


Figure 3.1: Research Design

3.2 Data

Hallet (1978) distinguishes data into two kinds using by researchers that are primary and secondary data. According to the author primary data is the first hand information that is acquired directly from the source such as survey, observations and experiments. On the other hand, the secondary data is data gathered by someone else rather than the researcher, the sources of secondary data includes censuses, organizational records and the findings of quantitative and qualitative researches.

In this respect, to obtain data on the real estate companies in Saudi Arabia, the current study uses secondary data that are fetched from Thomson Reuter's DataStream database. As we present later the needed items that are used to calculate the variables of the study includes the items of balance sheet and income statement that obtained from the sampled firms' statement from our source and the variables calculated manually since they are not available already.

3.3 Research Sample

The presented study has chosen the emerging market country that is the Saudi Arabia in a manner that the country is the biggest economy in the Middle East and one of the biggest economies globally moreover; the real estate sector is relatively developed. Semiannually reports of all real estate firms in KSA that are listed in the Saudi Arabia stock exchange market (Tadawul) which are nine companies collected over the time horizon chosen from 2010 to 2015 that are out of any crisis or economic recession. The study follows panel data methodology since it's a combination of time series between 2010 and 2015 and cross sectional of the performance of nine different real estate firms in the KSA. Bond (2002) states that panel data is a very efficient method for quantitative research that allows for including more variation in

the estimation of the population parameter. In the table 3.1 the sample companies have been listed.

Table 3.1: Sample Firms

Number	Company Name
1	Alandalus Property Co.
2	Arriyadh Development Co.
3	Dar Alarkan Real Estate Development Co.
4	Emaar The Economic City
5	Jabal Omar Development Co.
6	Knowledge Economic City
7	Makkah Construction and Development Co.
8	Saudi Real Estate Co.
9	Taiba Holding Co.

3.4 Variables of the Study

As mentioned earlier, the main objective of this study is to examine the working capital management of the real estate firms as a function the effect of the significant determinants as the corresponding variables. As they are listed in table 3.2 the variables are apparently divided in to dependent and independent variables.

3.4.1 Dependent Variable

The dependent variable of this study is cash conversion cycle that represents the working capital management. CCC measures the number of days a firm's sources is invested on the operations of business and as the sum of the Receivables Collection Period, plus the Inventory Conversion Period, minus the Payment Deferral Period. The longer the length of CCC, the larger the funds invested in working capital and then, higher is the firm's need for additional financing. The formulated CCC determinants was essentially followed the same pattern as the previous empirical

working capital determinants research as [Mansoori and Muhammad (2012); Mongrut et al., (2014); Haron and Norman (2015); Naser et al., (2013); Zariyawati (2010).

4.3.2 Independent Variables

I. Profitability

In this study profitability ratio follows the most common measurement that's net income divided by total assets. As outlined in previous chapter, the profitability may correlate with CCC positively or negatively but most of the findings that reviewed in the second chapter suggest a significant inverse relation between the two variables that's the higher the profitability the shorter the CCC such as Siriopoulos and Arvaintis (2012); Ganesan (2007); Haron and Norman (2015); Sökmen and Çetenak (2012).

II. Size

Concerning size, it is measured by the logarithm natural of total assets which a very popular way to measure it. Further, it was stated in the literature review in most of the reviewed empirical studies found that size has a negative and significant relationship with CCC, that's large firms tend to have shorter cash conversion cycle and have usually a higher turnover than smaller companies. the argument about size is supported by adequate literature such as Zariyawati et al., (2010); Naser et al., (2013); Haron and Norman (2015); Mangurut et al ., (2014) .

III. Sale Growth

As seen in the literature there is no clear relation between growth and working capital management. Growth might affect the components of working capital

managements in various ways. Growth is measured by annually growth of revenue in this study. Because of the uncertain relation of growth and CCC provide by the literature growth expected to have negative impact Zariyawati et al., (2010); Naser et al., (2013) and Haron and Norman (2015) or positive impact on CCC Mansoori and Muhammad (2012).

IV. Free Cash Flow

Free cash flows defined as the excess of cash flow beyond the needed amount to fund all the current projects with positive net present value, managers with substantial free cash flows tend to be stimulated to engage the firm with unnecessary expenses (Jensen 1986). As well as Palombini and Nakamura (2012) tested the impact of free cash flow on the CCC and found negative and significant relationship.

V. Leverage

Leverage ratio in this study is taken by the common measure that's total liabilities divided by total assets. According to pecking order theory profitable firms are more likely to raise funds internally rather than rely on debt (externally) (Myer, 1984), and thus leverage is negatively related to CCC (Palombini and Nakamura, 2012). However as presented in the previous chapter, sufficient evidences from literature indicate for positive relation between leverage and CCC such as Naser et al., (2013); Zariyawati et al., (2010); Haron and Norman (2015).

Table 3.2: Variables of the Study

Variables	Type of the Variables	Abbreviations
Cash Conversion Cycle	Regressand	CCC
Return on Asset	Regressor	ROA
Firm Size	Regressor	SIZE
Sale Growth	Regressor	GRTH
Free Cash Flow	Regressor	FCL
Leverage	Regressor	LEV

The variables above are calculated by relative ratios as presented in Tble3.3 and 3.4.

Table 3.3: Dependent Variables Measurements

Variables	Proxy
CCC_{it}	<p>Logarithm of Cash Conversion Cycle CCC = DIO + DSO - DPOWhere:</p> <p>DIO (Days Inventory Outstanding) = $\frac{\text{Average Inventory}}{\text{Cost of Goods Sold} / 365}$</p> <p>DSO (Days Sales Outstanding) = $\frac{\text{Average Account Receivable}}{\text{Revenue} / 365}$</p> <p>DPO (Days Payable Outstanding) = $\frac{\text{Average Account Payable}}{\text{Cost of Goods Sold} / 365}$</p>

Table 3.4: Independent Variables Measurements

Variables	Proxy	Measurements
ROA_{it}	The Ratio of Net Income to Total Assets	$\frac{Net\ Income}{Total\ Assets}$
$SIZE_{it}$	Log Natural of Total Assets	$LogNaturalofTotalAssets$
$GRTH_{it}$	Growth in Sales of the Firms	$\frac{Sale\ 1 - Sale\ 0}{Sale\ 0}$
FCL_{it}	(Operating income before depreciation - total taxes - interest expenses- preferred share dividends - common share dividends) / total assets at beginning of fiscal year	$\frac{INC - TAX - INTEXP - PSDIV - CSDIV}{Total\ Assets}$
LEV_{it}	The Ratio of Total Liability to Total Assets	$\frac{Total\ Liability}{Total\ Assets}$

3.5 Research Questions, Hypotheses, and Models

3.5.1 Research Questions

According to the particular characteristics of the current study, the study is developed to answer a substantial question through which the study can reach the objective, the question is:

- What are the significant determinants of working capital management in the Saudi Arabia real estate sector?

3.5.2 Hypotheses

Soon research questions have been addressed the following assumptions hypothesized to be tested. Hypotheses of this thesis are:

6. H0: Profitability has not significant impact on WCM in Real Estate sector in KSA.
7. H0: Firm Size has not significant impact on WCM in Real Estate sector in KSA.
8. H0: Firm Growth Sale has not significant impact on WCM in Real Estate sector in KSA.
9. H0: Free Cash Flow has not significant impact on WCM in Real Estate sector in KSA.
10. H0: Leverage has not significant impact on WCM in Real Estate sector in KSA.

3.5.3 Model Specification

Concerning the research question, this study conducts the linear regression analysis with six different variables. To do so, one equation is applied. In the model of this study, the cash conversion cycle which is the representative of working capital management is the dependent variable. Consequently the regression will reveal the impact of each explanatory variable on the dependent variable that is the cash conversion cycle.

Based on our panel data the equation takes the bellow form:

$$Y_{it} = a + \beta X_{it} + u_{it}$$

Where:

Y_{it} Stands for explained variable in the model

a Represents the intercept of the equation

β Represents the coefficient

X_{it} Stands for explanatory factor (i) at (t) time

u is the error term of the model

i present the cross-sectional dimension

t Presents the time series dimension

The empirical model to be used in this study for the cash conversion cycle as explained variables and pre and post crisis are presented as follow:

$$CCC_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 GRTH_{it} + \beta_4 FCL_{it} + \beta_5 LEV_{it} + u_{it}$$

Where:

CCC_{it} = Logarithm of Cash Conversion Cycle of firm i at time t

$\beta_1 ROA_{it}$ = The Ratio of Return on Asset Ratio of Firm i at time t

$\beta_2 SIZE_{it}$ = Log Natural of Total Assets of firm i at time t

$\beta_3 GRTH_{it}$ = Growth in Sales of the Firms of firm i at time t

$\beta_4 FCL_{it}$ = The Ratio of Free Cash Flows of firm i at time t

$\beta_5 LEV_{it}$ = The Ratio of Total Liability to Total Assets of firm i at time t

Chapter 4

EMPIRICAL FINDINGS

4.1 Descriptive Statistics

Descriptive Statistics provides a prior understanding of the data of this study that has been calculated by E-views in the current study and presented in the following table:

Table 4.1: Descriptive Statistic

	CCC	ROA	LNSIZE	GRTH	LEVG	FCF
Mean	0.004078	0.071676	15.48713	0.104040	0.266679	0.076006
Median	0.002062	0.046276	15.29669	0.008975	0.311732	0.065093
Maximum	0.030224	0.204154	17.08821	3.867067	0.516091	0.414814
Minimum	3.51E-05	0.005996	14.06978	-0.659081	0.000000	-0.058518
Std. Dev.	0.006571	0.058243	0.794849	0.553295	0.156397	0.082442
Observations	54	54	54	54	54	54

According to the data of the time horizon and data of this study the distance between mean of all variables with the maximum and minimum variable are very big, this implies that the performance of real estate firms in Saudi Arabia is not stable and relatively highly fluctuating.

4.2 Correlation Matrix

High correlation between two variables in the multiple regression models may generate the multicollinearity problem. When the data set has

multicollinearity problem the coefficients will not be calculated accurately. In this respect according to Lewis (1993), if the coefficients in the correlation matrix are not more than 80%, the multicollinearity cannot be issue in the regression analysis. As it's presented in the table 4.2 in the current study the highest coefficient between the variables is 0.68 which is less than 0.8. Finally it can be concluded that the data set of this study has no multicollinearity problem.

Table 4.2: Correlation Matrix

	CCC	ROA	LNSIZE	GRTH	LEVG	FCF
CCC	1.000000					
ROA	-0.178841	1.000000				
LNSIZE	0.375611	-0.397557	1.000000			
GRTH	0.529306	-0.106420	0.098778	1.000000		
LEVG	0.078186	-0.683793	0.081813	0.157462	1.000000	
FCF	-0.291370	0.136439	-0.319775	-0.079040	0.049964	1.000000

4.3 Panel Unit Root Test

To pursue the regression analysis, unit root test is a classic method to check whether the data is stationary or not. Among various criteria to check the stationary of the data set this study has taken by Augmented Dicky Fuller, Philip Pherons and Levin Lin Chu test to investigate whether the data is stationary or non-stationary. The result of the test reported in the table 4.3 and revealed the significant values that null hypothesis could be rejected in ADF, PP and LLC at Level for almost all of the variables. It can be concluded that, the presented study has no unit root problem.

Table 4.3: Panel Unit Root Test

Variables	Levin Lin Chu	ADF Fisher Chi square	PP Fisher Chi square
CCC τ_T	-8.33019 *	31.8696**	48.1682*
τ_μ	-9.47538*	28.2157**	57.5556*
τ	-1.70575**	32.1732**	39.0471*
ROA τ_T	-35.5839*	47.0047*	74.0498*
τ_μ	-2.69446*	0.10340	16.5867
τ	-2.24193**	23.7451	31.7731**
SIZE	-1.31586***	26.0997***	32.7874**
τ_T	-13.3450*	28.27493***	54.2401*
τ_μ	-7.57947*	54.7647*	60.3529*
τ			
GRTH τ_T	-1.21031	256664	28.7417***
τ_μ	-16.9279*	-1.06301	62.9403*
τ	-8.65708*	56.9273*	56.4380*
LEVG	-15.8817*	40.3864*	60.0333*
τ_T	-41.5353*	48.4916*	75.9130*
τ_μ	-2.49279*	41.3771*	44.8733*
τ			
FCF τ_T	-16.5582*	48.0220*	52.0147*
τ_μ	-13.4661*	32.1354**	56.9040*
τ	-1.71651**	31.5580**	32.1417**

Notes:

- Null Hypothesis: Data Has Unit Root or is not Stationary.
- Asterisks (***), (**) & (*) denotes 10%, 5% & 1% significant level. .
- τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lag lengths are selected based on Schwartz Criterion.

4.4 Autocorrelation

The disturbance values supposed to be not correlated systematically, in other words, they would not be correlated negatively or positively (Gujarati 2004 pp.70).The moderate rule of thumb about whether the dataset has autocorrelation or not is that if Durbin Watson value is between 1 and 3 or more precisely around 2, there is no

concern for autocorrelation problem. This study employs OLS regression analysis on one model that consists with five independent variables .As showed in table 4.5, the regression output reports DW of 1.715. Hence, it can be concluded that the data of this study has no autocorrelation problem

4.5 Regression Analysis

For panel data, before implementing the OLS regression test it should be investigated whether random effect or fixed effect is appropriate for the given data set. For this purpose the Hausman test applied and the result reports to be significant meaning that the null hypothesis (random effect) is rejected.

Table 4.4: Correlated Random Effects - Hausman Test

cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	30.804283	5	0.0000

Table 4.5: Regression Analysis

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	0.076539	0.027802	2.752982	0.0088
ROA	-0.035756	0.013916	-2.569436	0.0140
LNSIZE	-0.004374	0.001807	-2.420057	0.0202
GRTH	0.002802	0.000525	5.334875	0.0000
FCF	-0.004518	0.004961	-0.910648	0.3679
LEVG	-0.007910	0.003543	-2.232537	0.0312
R-squared	0.941412			
F-statistic	49.44108			
Prob.(F-statistic)	0.000000			
Durbin-Watson stat	1.715699			

R-squared measures how data fits the regression equation. The regression estimation reports 0.94 that indicates sufficient evidence to support our model in this study. F-statistics test indicates whether all coefficients in the regression model are the same or not, in this respect, the null hypothesis states that all coefficients are equal to zero but having F-prob. (0.0000) for the models means that null hypothesis is rejected. Finally, it can be concluded that the explanatory variables of this study can impact explained variables jointly, and the regression equation has some validity in fitting the data.

4.5.1 ROA

The regression output revealed a negative and statistically significant association between ROA and CCC. This implies that the higher profit of the firm the shorter the cash conversion cycles. The result is consistent with Archavli et al., (2012), Ganesan (2007) and Vural et al., (2012). Hence, the 1st hypothesis of this study that states no significant relationship between profitability and working capital management is rejected.

4.5.2 Size

We found a very weak and inverse but significant relationship between size and CCC. The finding is parallel with the finding of Zariyawati et al., (2010) and Naser et al., (2013) and their discussion that large companies may have a good relationship with the suppliers on the other hand large firms tend to have shorter cash conversion cycle and have usually a higher turnover than smaller companies. Thus, 2nd hypothesis of the current study is rejected that is size is significantly impact WCM.

4.5.3 Sale Growth

The result, as seen in the table 4.5 reports a small coefficient, significant and positive relationship between sale growth and CCC. It might be the case that the prediction

for future sales growth can cause to increase the amount of investment. The same result was found by Mansoori and Muhammad (2012). Therefore, the 3rd hypothesis of the current thesis is rejected and a significant relationship between growth in term of sales and WCM is confirmed.

4.5.4 Free Cash Flow

A small coefficient value and positive insignificant correlation was found between FCF and CCC. The finding may be due to managers with substantial free cash flows tend to be stimulated to engage the firm with unnecessary expenses (Jensen, 1986). Hence, 4th hypothesis cannot be rejected.

4.5.6 Leverage

Concerning the impact of leverage on WCM, finding in the present study is consistent with Palombini and Nakamura (2012) and Zariyawati et al., (2010) that found a negative and statistically significant relationship between debt ratio and CCC. The case can be because of the pecking order theory that is the profitable firms are more likely to borrow less and prefer the internal financing. Thus, 5th hypothesis of the study is also rejected.

Chapter 5

CONCLUSION

5.1 Summary of Finding

As it has been presented earlier, this study deals with the factor that impacting and determining the variation of working capital management in the real estate companies, using the data of nine real estate companies that listed in Saudi stock exchange (Tadawul) for six years from 2010 to 2015. It should be observed that the chosen period is out of any financial and economy crisis. Econometrics method that employed in this thesis is panel data methodology and the estimation is based on OLS regression analysis.

Based on the objective of the current study five hypotheses have been developed and tested. The variables of the study are cash conversion cycle that represents WCM as well as dependent variable. However the independent variables are profitability, size, sales growth, free cash flows and leverage. The regression output reports very weak coefficients for all the variables this may be because the independent variables are not effecting the working capital management too much.

Findings of the study suggest negative and significant impact of profitability on working capital management that's the shorter the CCC the higher the profit. Regarding the relationship between the working capital management and size of company that measures by log natural of total assets we found an inverse and

significant relationship between the two variables that implies the bigger firms tend to have shorter cash conversion cycle and have usually a higher turnover than smaller companies. The Sales growth is positively and significantly affects the WCM the case might be because that the prediction for future sales growth can cause to increase the amount of investment. We found the relationship between free cash flow and CCC to be positive but insignificant and finally the relationship between debt ratio and CCC reported to be negative and significant.

5.2 Limitations and Suggestions

This empirical study was limited to five factors among many possible explanatory variables that have proved to have significant influence on working capital management in the previous literature. Therefore, further researches are recommended to consider other explanatory variables such as external factors like financial development and economic development. The sampled firms are only nine firms that are all the real estate firms listed in the Saudi stock exchange (Tadawul) and the time horizon limited to 2010 to 2015. However, longer time period can be considered. Further firms or larger sample is suggested to have more reliable and precise results.

REFERENCES

- Akinwande, G. S. (2009). Working Capital Management in Telecommunication Sector, A Case Study of VGC Telecoms, *School of Management, Blekinge Institute of Technology*.
- Archavli, E., Siriopoulos, C., & Arvanitis, S. (2012). Determinants of Working Capital Management. *Technological Educational Institute (T.E.I.) of Crete*.
- Atseye, F. A., Ugwu, J. I., & Takon, S. M. (2012). Determinants of Working Capital Management. *International Journal of Economics, Commerce and Management*, 3 (2), 1-11.
- Banerjee, B. (2009). Corporate Environmental Management. PHI Learning Pvt. Ltd..
- Baños-Caballero, S., Teruel, P. J. G., & Solano, P. M. (2011). Working capital management, corporate performance, and financial constraints. *Documentos de Trabajo FUNCAS*, (627). Bond, S. (2002).
- Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese economic journal*, 1(2), 141-162.
- Chiou, J. R., Cheng, L., & Wu, H. W. (2006). The determinants of working capital management. *Journal of American Academy of Business*, 10(1), 149-155.

- Chui, L. H. T., & Chau, K. W. (2005). An empirical study of the relationship between economic growth, real estate prices and real estate investments in Hong Kong. *Surveying & Built Environment*, 19.
- Damodaran, A., (1997). corporate finance: Theory and Practice, *published by John Wiley & Sons, Inc*, United States of America.
- Dhar, P., & Paul, K. (2011). Determinants of working capital: an empirical inquest with reference to some selected public sector companies in India. *A Journal of Radix International Educational and Research Consortium*, 1(1).
- Ganesan, V. (2007). An analysis of working capital management efficiency in telecommunication equipment industry. *Rivier academic journal*, 3(2), 1-10.
- Hallett, P. E. (1978). Primary and secondary saccades to goals defined by instructions. *Vision research*, 18(10), 1279-1296.
- Haron, R., & Nomran, N. M., (2015). Determinants of Working Capital Management Before, During And After The Global Financial Crisis of 2008: Evidence From Malaysia. *Proceedings of the Asia Pacific Conference on Business and Social Sciences 2015*, Kuala Lumpur.
- Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *Corporate Finance, and Takeovers. American Economic Review*, 76(2).

- Klimczak, K. (2010). Determinants of Real Estate Investment. *Economics & Sociology*, 3(2), 58.
- Kong, Y., Glascock, J. L., & Lu-Andrews, R. (2016). An Investigation into Real Estate Investment and Economic Growth in China: A Dynamic Panel Data Approach. *Sustainability*, 8(1), 66.
- Kulkarni, A. (2011). Working Capital Policies, retrieved from: <http://www.buzzle.com/articles/working-capital-policy.html> 13.3.2016
- Kwenda, F., & Holden, M. (2014). Determinants of Working Capital Investment in South Africa: Evidence from Selected JSE-Listed Firms. *Journal of Economics and Behavioral Studies*, 6(7), 569.
- Lamberson, M. (1995). Changes in working capital of small firms in relation to changes in economic activity. *American Journal of Business*, 10(2), 45-50.
- Lewis, J. (1993). Developing the mixed economy of care: emerging issues for voluntary organizations. *Journal of Social Policy*, 22(02), 173-192.
- Loyford, M. M., & Moronge, M. (2014). Effects of economic factors on performance of real estate in Kenya. *European Journal of Business Management*, 1(11), 181-200.

Luo, M. M., Yee Lee, J. J., & Hwang, Y. (2009). Cash Conversion Cycle, Firm Performance and Stock Value, Retrieved from <http://www90.homepage.villanova.edu/michael.pagano/ML> 02.04.2016.

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

McMahon, R. G. (2006). Financial slack amongst manufacturing SMEs from Australia's business longitudinal survey: An exploratory study. *Small Enterprise Research*, 14(1), 14-38.

Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13 (1): 187-221.

Naceur, S. B., Cherif, M., & Kandil, M. (2014). What drives the development of the MENA financial sector? *Borsa Istanbul Review*, 14(4), 212-223.

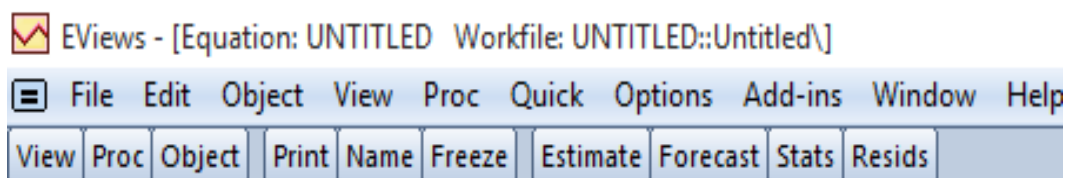
Naser, K. A. M. A. L., Nuseibeh, R. A. N. A., & Al-Hadeya, A. H. M. E. D. (2013). Factors influencing Corporate working capital management: Evidence from an Emerging Economy. *Journal of Contemporary Issues in Business Research*, 2(1), 11-30.

- Padachi, K. (2006). Trends in working capital management and its impact on firms performance: an analysis of Mauritian small manufacturing firms. *International Review of business research papers*, 2(2), 45-58.
- Palombini, N. V. N., & Nakamura, W. T. (2012). Key factors in working capital management in the Brazilian market. *Revista de Administração de Empresas*, 52(1), 55-69.
- Shin, H. H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability. *Financial practice and education*, 8, 37-45.
- Valadez, R. M. (2011). The housing bubble and the GDP: a correlation perspective. *Journal of Case Research in Business and Economics*, 3, 1.
- Vural, G., Sökmen, A. G., & Çetenak, E. H. (2012). Affects of Working Capital Management on Firm's Performance: Evidence from Turkey. *International Journal of Economics and Financial Issues*, 2(4), 488.
- Yin, R. K. (2003). Case study research: Design and methods, 3rd edn. Applied Social Research Methods Series, vol. 5.
- Zariyawati, M. A., Taufiq, H., Annuar, M. N., & Sazali, A. (2010, June). Determinants of working capital management: Evidence from Malaysia. In *Financial Theory and Engineering (ICFTE), 2010 International Conference on* (pp. 190-194). IEEE.

Zhang, Y., Wang, Y., Li, J., & Cai, B. (2015). The Research on the Relationship of Financial Expenditure, Real Estate Development and Economic Growth-An Empirical Study of Fujian Province. *International Journal of u-and e-Service, Science and Technology*, 8(10), 311-324.

APPENDICES

Appendix A :Hausman Test



Correlated Random Effects - Hausman Test

Equation: Untitled


Test cross-section random effects


Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	33.814392	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ROA	-0.036613	-0.033759	0.000056	0.7026
LNSIZE	-0.010013	-0.000014	0.000011	0.0022
GRTH	0.002801	0.003060	0.000000	0.0186
LEVG	-0.008427	-0.009137	0.000002	0.5655
FCF	-0.004780	-0.007062	0.000003	0.1580

Appendix B: Unit Root Test

 EViews - [Equation: UNTITLED Workfile: UNTITLED::Untitled\]

 File	Edit	Object	View	Proc	Quick	Options	Add-ins	Window	Help
View	Proc	Object	Print	Name	Freeze	Estimate	Forecast	Stats	Resids

Dependent Variable: CCC
 Method: Panel Least Squares
 Date: 05/18/16 Time: 21:45
 Sample: 2010 2015
 Periods included: 6
 Cross-sections included: 9
 Total panel (balanced) observations: 54

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.076131	0.027031	2.816435	0.0075
ROA	-0.036613	0.013860	-2.641688	0.0117
LNSIZE	-0.010013	0.004047	-2.474176	0.0177
GRTH	0.002801	0.000524	5.348900	0.0000
LEVG	-0.008427	0.003502	-2.406213	0.0208
FCF	-0.004780	0.004947	-0.966346	0.3397

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.941748	Mean dependent var	0.004078
Adjusted R-squared	0.922817	S.D. dependent var	0.006571
S.E. of regression	0.001826	Akaike info criterion	-9.555502
Sum squared resid	0.000133	Schwarz criterion	-9.039839
Log likelihood	271.9985	Hannan-Quinn criter.	-9.356631
F-statistic	49.74443	Durbin-Watson stat	1.701836
Prob(F-statistic)	0.000000		

Appendix C: Unit Root Test for Independent Variables

Series: CCC Workfile: UNTITLED::Untitled\

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats

Panel Unit Root Test on CCC

Panel unit root test: Summary
 Series: CCC
 Date: 05/18/16 Time: 22:20
 Sample: 2010 2015
 Exogenous variables: Individual effects
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.33019	0.0000	9	45
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.29869	0.0970	9	45
ADF - Fisher Chi-square	31.8696	0.0228	9	45
PP - Fisher Chi-square	48.1682	0.0001	9	45

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Series: CCC Workfile: UNTITLED::Untitled\

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats

Panel Unit Root Test on CCC

Panel unit root test: Summary
 Series: CCC
 Date: 05/18/16 Time: 22:30
 Sample: 2010 2015
 Exogenous variables: Individual effects, individual linear trends
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.47358	0.0000	9	45
Breitung t-stat	0.42923	0.6661	9	36
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.60070	0.2740	9	45
ADF - Fisher Chi-square	28.2157	0.0588	9	45
PP - Fisher Chi-square	57.5556	0.0000	9	45

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

