CHAPTER 1 :   INTRODUCTION

1.1   Background of Study

Working capital management is part of the financing considerations that a finance manager of a corporation needs to determine, besides capital structure and capital budgeting (Ross, Westerfield and Jordan, 2010). In view that each company emphasized on maximizing profitability that can be generated from their business operation, many studies had been conducted on the effect of capital structure and working capital management in determining the profitability, which the results varies based on the study undertaken. In this study, working capital management components and working capital management policy are analysed on their effect towards the firm's profitability.

Meanwhile, in determining the firm's profitability, the finance manager also need to take into account the firm's working capital management, which basically means managing the firm's current assets and current liabilities at satisfactory level (Dong and Su, 2010; Gill, Biger and Mathur, 2010). Generally, in a balance sheet, current assets consist of raw materials, work in progress, finished goods or inventories, account receivables, cash and bank balances which are short term in nature that are used for production and sales; which are able to be converted to cash within the year. On the other hand, current liabilities refer to obligations that need to be paid within the year or not beyond the business operating cycle, whichever is earlier (Ross, Westerfield and Jaffe, 2005). Generally, current liabilities comprise of

accounts payable, accrued wages, taxes and other expenses payable and short-term debt. Hence, it is vital in managing the working capital efficiently as it is able to increase the firm's profitability and shareholder value (Smith, 1980; Deloof, 2003, Dong and Su, 2010). Furthermore, the benefits of having an efficient working capital management are the firms able to meet its short term obligations and maintain adequate liquidity position in order to continue the operation of the firms (Eljelly, 2004).

In view that working capital management decision is important factor as it determines the firm values maximisation and shareholders wealth; many researches had conducted various studies to examine on the relationship between working capital management and firm's performance over the last decades. However, the findings are inconsistent for different studies carried out by numerous researchers and are performed separately. Furthermore, there is also lack of study being conducted on the effect of working capital management on the profitability of firms in Malaysia.

In this study, efficiency of working capital management (WCM) is represented by cash conversion cycle (CCC), together with WCM components such as number of days Accounts Receivable (ARD), number of days Inventories (INV) and number of days Accounts Payable (AP) are analysed on their effect towards firm's profitability, measured by gross operating profit (GOP). Control variables such as current ratio (CR), firm size (SIZE), sales growth (GROWTH) and debt (DEBT) ratio are also being examined in order to determine their effect towards the profitability of the firm. Furthermore, this

study also analyses on the effect of working capital management (WCM) policy adopted by the firms, whether aggressive or conservative policy being implemented by the firms in services and manufacturing sector.

Therefore, this study is to fill up the gap in the study of working capital management on profitability of the firm's performance by focusing on services and manufacturing firms in Malaysia, which are represented by trading/services and industrial products sector respectively in Main Market of Bursa Malaysia during year 2006 to 2010, which also coincides with the Ninth Malaysia Plan (9MP). The services and manufacturing sector are the focus of the study in view that both the sectors contributed 85.3% share of Malaysia's gross domestic product in 2010 and also in addition to the emphasis placed by government via Malaysia Third Industrial Master Plan (IMP3) from year 2006 to 2020.

1.2   Malaysia's Third Industrial Master Plan (IMP3) 2006-2020

The First Industrial Master Plan initiated during the period of 1986 to 1995 had formed groundwork for manufacturing sector to develop as a key economic growth sector, while the Second Industrial Master Plan (IMP2), 1996-2005 had further expanded the role of the manufacturing sector in Malaysia's economy (Third Industrial Master Plan). However, with the implementation of Third Industrial Master Plan (IMP3) 2006-2020, the development of the industrial segment in this country is anticipated to be further improved internationally via transforming and innovating the manufacturing and services sector (Third Industrial Master Plan).

1.3   Overview of Five Sectors Performances in Malaysia

A summary of overall five sectors performances in Malaysia in terms of Gross Domestic Product (GDP) during the period of 2006 to 2010 can be viewed from Table 1.3a: Gross Domestic Product (GDP) by Sector (at constant 2000 price) by percentage change of GDP and Table 1.3b: Gross Domestic Product (GDP) by Sector (at constant 2000 price) by percentage share of GDP.

Table 1.3a: Gross Domestic Product (GDP) by Sector, 2006-2010 (at constant 2000 price) by percentage change of GDP

Sector	Change (%)				
	2006	2007	2008	2009	2010
Agriculture	5.2	2.2	4.0	0.4	2.1
Mining	-0.4	3.3	-0.8	-3.8	0.2
Manufacturing	7.1	3.1	1.3	-9.4	11.4
Construction	-0.5	4.6	2.1	5.8	5.1
Services	7.2	9.7	7.2	2.6	6.8
Less: Undistributed FISIM*	3.4	7.5	5.4	7.2	5.8
Add: Import Duties	-12.1	4.4	23.9	-5.8	9.6
GDP	5.9	6.3	4.6	-1.7	7.2

*Financial Intermediation Services Indirectly Measured (FISIM)
(Source : Department of Statistics and Ministry of Finance, Malaysia
Economic Report 2007/2008, 2008/2009, 2009/2010, 2010/2011, 2011/2012)

Table 1.3b: Gross Domestic Product (GDP) by Sector, 2006-2010 (at constant 2000 price) by percentage share of GDP

Sector	Share of GDP (%)				
	2006	2007	2008	2009	2010
Agriculture	7.9	7.6	7.5	7.7	7.3
Mining	8.8	8.4	8.1	7.7	7.0
Manufacturing	31.1	30.1	29.1	26.6	27.6
Construction	3.1	3.0	3.0	3.3	3.3
Services	51.8	53.6	55.0	57.6	57.7
Less: Undistributed FISIM*	3.9	3.9	3.9	4.2	4.1
Add: Import Duties	1.1	1.1	1.3	1.2	1.3
GDP	100.0	100	100	100	100

*Financial Intermediation Services Indirectly Measured (FISIM)
(Source : Department of Statistics and Ministry of Finance, Malaysia
Economic Report 2007/2008, 2008/2009, 2009/2010, 2010/2011, 2011/2012)

Based on the above Table 1.3a, overall, Malaysia's GDP had increased slightly from 5.9% in 2006 to 6.3% in 2007. However, from year 2008 to 2009, the country's GDP had declined to 4.6% and negative 1.7% in 2008 and 2009 respectively, which was mainly due to the global economic crises experienced in year 2008 (Economic Report 2010/2011). In year 2010, Malaysia's economy had revived and reported a GDP growth of 7.2% (Economic Report 2011/2012). From Table 1.3b, noted that services sector is the key driver of economic growth, which consists of more than 50% of the country's GDP and had shown an increasing trend from year 2006 onwards to 57.7% shares of GDP in 2010 (Economic Report 2011/2012). However, noted that the manufacturing sector performance had showed a declining trend from 31.1% share of GDP in 2006 to 26.6% share of GDP in 2009 (Economic Report 2010/2011). However, in 2010, the manufacturing sector's performance had improved slightly by 1% to 27.6% share of GDP in 2010 (Economic Report 2011/2012).

1.3.1 Overview of Services and Manufacturing sector performance

Based on Bank Negara Malaysia's (BNM) Annual Report 2006 and Economic Report 2007/2008, Malaysia's economy had registered a real gross domestic product (GDP) growth of 5.9% in year 2006, which was mainly contributed by strong internal demand and continuous healthy exports. Based on Table 1.3a, the services sector had spearheaded the overall economy by recorded a 7.2% growth in GDP, followed by 7.1% growth in GDP from manufacturing sector which revealed a slight structural movement in Malaysian economy from manufacturing to services (Economic Report 2007/2008).

Based on the Economic Report 2007/2008, the services sector comprises of intermediate services, final services and government services. The intermediate services consist of transport and storage, communication, finance and insurance, real estate and business services sub-sectors, while final services is represented by utilities, wholesale and retail trade, accommodation and restaurant, and other services sub-sectors. Meanwhile, based on the Economic Report 2007/2008, the manufacturing production index performance is divided into export-oriented industries and domestic-oriented industries.

In 2006, services sector contributed 51.8% share of GDP while manufacturing sector consists of 31.1% share of GDP. Based on the services sector performance, the top two services sub-sectors are wholesale and retail trade that had expanded by 7.1% of GDP with 11.6% share of GDP in services sector, and followed by finance and insurance sub-sectors generated a 7.7% growth in GDP with 10.2% share of GDP in services sector (Economic Report 2007/2008). The increase in finance and insurance sub-sector is due to expansion in consumer credit, investment for businesses, Islamic financing and higher demand for investment-linked, medical and health insurance products. Meanwhile, the growth in wholesale and retail trade sub-sector is mainly due to strong private consumption, increase in disposable income, expansion in retail activity and promotion of tourism industry, which is in conjunction with Visit Malaysia Year 2007 (Economic Report 2007/2008).

The manufacturing sector reported a growth of 7.1% with 31.1% shares to GDP in 2006 (Economic Report 2007/2008), which is strengthen by the worldwide electronics upward trend, higher requirement for resource-based industries such as petroleum, rubber and off-estate processing that enjoyed increase in export prices and enhancement in performance of domestic-oriented industries by 7.2% in 2006, which is attributed by construction related industries known as iron and steel, non-metallic products and fabricated metal products (BNM Annual Report 2006).

Despite vulnerable economic environment, Malaysia's GDP increased by 6.3% in 2007, which was attributed by healthy domestic demand especially in private consumption and investment activities (BNM Annual Report 2007). The services sector maintains as the main generator of economic growth by reporting a 9.7% growth in GDP, which accounted for 53.6% share of GDP in 2007 (Economic Report 2008/2009). The growth was mainly due to increase in domestic demand and activities related to tourism in tandem with Visit Malaysia Year 2007. Reportedly, the major contributors to robust performance of services sector comes from real estate and business services; finance and insurance; communication; and wholesale and retail trade sub-sectors (BNM Annual Report 2007). For manufacturing sector, it had reported moderate growth of 3.1% in 2007 (2006: 7.1%) with its contribution to overall GDP decline slightly to 30.1% shares (Economic Report 2008/2009) as a result of decline in demand for electronics and electrical (E&E) industry (BNM Annual Report 2007). However, the moderate growth has been mitigated by broad manufacturing base and increase in demand for local and resource-based

industries such as rubber, petroleum, chemicals and chemical products from Asia-Pacific region (BNM Annual Report 2007).

According to BNM's annual report 2008, Malaysia had recorded GDP growth of 4.6% in 2008 despite experienced global economic crisis in the second half of 2008, which had impacted the country's export as well as resulted in lower private investment activities. Services sector had remained as the main contributor towards GDP by reporting growth rate of 7.2% of GDP and 55% share of GDP in 2008. The services sector had maintained as a leader in economic growth due to increase in demand domestically, growth in trade and tourism activities via opening up more hypermarkets and retail outlets in conjunction to Visit Malaysia Year and Mega Sales carnivals being extended, which encouraged public spending. However, manufacturing sector had showed a drop in GDP's growth of 1.3% in 2008 (2007: 3.1%), which is motivated by domestic-oriented industries in view that export-oriented industries had contracted significantly arising from decline in global demand specifically in the E&E industry. In spite of that, manufacturing sector stood as second highest contribution towards the country's GDP by recording a 29.1% share of GDP in 2008 (2007: 30.1%).

In 2009, Malaysia economy had shrank by 1.7% in 2009 as a result of the global economy slowdown experienced in 2008. The domestic economy declined by 6.2%, while exports and industrial production registered double-digit decrease due to deteriorating demand globally (BNM Annual Report 2009). In first quarter of 2009, the services sector reported a moderate drop in

performance arising from deterioration from services sub-sectors associated to manufacturing and trade activities. However, from second quarter onwards, the services sector had shown an improvement in performance which is derived from services sub-sectors that relied on domestic economy and activities associated to finance and capital market. For manufacturing sector, it was severely impacted by global economic slowdown which recorded a decline of 22.8% in 2009, especially in the electronics and electrical products (E&E) cluster in the export-oriented industry. However, situation improved gradually from second quarter onwards with positive growth reported in production in the fourth quarter of 2009.

There are three policy measures being implemented in order to mitigate the global economic recession such as two fiscal economic stimulus packages totalling RM67 billion which aims to support domestic demand, minimizing the effect of global economic slowdown on impacted sectors as well as to reduce unemployment rate in the country. The second policy being implemented refers to monetary stimulus package such as reduction in overnight policy rate by 150 basis points to 2.0% between November 2008 and February 2009; and reduction in statutory reserve requirement by 300 basis points to 1.0% in order to lessen the intermediary cost, mitigates the slowdown in external demand and to enhance consumer and business outlooks domestically. Meanwhile, comprehensive measures are also being introduced to enable continuous access to financing such as guarantee scheme for SMEs and businesses (BNM Annual Report 2009).

Based on BNM Annual Report 2010, Malaysia economy had resumed its growth by expanding at 7.2% of GDP in 2010 (2009: -1.7%). The services sector had gain advantages derived from strong domestic and external demand, which has still maintained its position as the highest contributor towards GDP growth by recording a 57.7% share of GDP with higher 6.8% growth in 2010 for all services sub-sectors (2009: 2.6%), predominantly in finance and insurance; wholesale and retail trade; communication; and transport and storage sub-sectors in the first half of 2010. In the second half of the year, reasonable growth was reported in view of declining external demand that had impacted the trade and manufacturing-associated services sub-sectors. However, as domestic activity spending and domestic demand expanded, the services sub-sectors had gained advantage mostly from wholesale and retail trade; and communication sub-sectors. Meanwhile, manufacturing sector had recuperated strongly in 2010 by registering 11.4% growth (2009: -9.4%) and remained as second largest contributor with 27.6% shares of GDP, which was motivated by growth in both the export and domestic-based industries. The development of export-based industries specifically in electronics and electrical products (E&E) components is as a result of revitalization of investment in information technology and greater consumer expenditure on electronics such as semiconductors and audio-visual products. For domestic-based industries, it had registered a growth of 15.6% (2009: -5.7%) which is strengthens by domestic consumption activity.

1.4   Statement of the Problem

Malaysia has undergone a tremendous development from an agricultural and commodity-based economy towards a middle-income nation by registering real Gross Domestic Product (GDP) growth of an average of 5.8% per annum from 1991 to 2010 (Tenth Malaysia Plan, 2011-2015). There are three important nationwide policy structures such as New Economic Policy (NEP), 1971-1990, National Development Policy (NDP), 1991-2000 and National Vision Policy (NVP), 2001-2010 being implemented with the purpose of achieving a developed nation status by year 2020 as in line with Vision 2020.

With the introduction of the Ninth Malaysia Plan, 2006 to 2010, one of the directions is to shift the economy upward the value chain via expansion in the productivity, competitiveness and value added activities of agriculture, manufacturing, and services sectors (Ninth Malaysia Plan). This is also in tandem with the implementation of Malaysia's Third Industrial Master Plan (IMP3) from year 2006 to 2020 which focuses on transforming and innovating the manufacturing and services sector (Third Industrial Master Plan). Furthermore, there are several incentives introduced during Ninth Malaysia Plan to lessen the cost of operating business such as the removal of Foreign Investment Committee (FIC) guidelines to attract more foreign and domestic investment, simplify the business licences and registration process, and liberalisation policy initiated for conventional and Islamic finance sector, which there is liberalisation for a total of 27 services subsectors with no equity requirement (Tenth Malaysia Plan). Based on Third Industrial Master Plan, there are also direct and indirect tax incentives introduced for sectors such as

manufacturing, agriculture, tourism (together with hotel) which also caters for research and development (R&D) activities.

In year 2008, the global economic slowdown and Malaysia's open economy policy had resulted in the country's GDP declined by 1.7% in 2009 and deterioration in industrial production and manufacturing exports as it relied heavily on global demand (Tenth Malaysia Plan). However, despite the global economic slowdown, based on Economic Report 2010/2011, the services sector had experienced a positive GDP's growth rate of 2.6% in 2009 which represents 57.6% share of GDP in 2009 as compared to manufacturing sector reported a negative 9.4% growth in GDP with 26.6% share of GDP in 2009.

Therefore, in this study, the main reason for services and manufacturing sectors being analysed is due to services sector has surpassed the performance of the manufacturing sector as it represents 57.7% shares of Malaysia's GDP in 2010 (the highest contributor for GDP), as compared to manufacturing sector which reported as the second highest contributor with 27.6% shares of Malaysia's GDP in 2010 (Economic Report 2011/2012). Hence, it is vital to analyse on the performance of firms in both the services and manufacturing sectors as it constitutes 85.3% shares of Malaysia's GDP in 2010. Furthermore, this is also in tandem with the emphasise placed by government via Malaysia's Third Industrial Master Plan (IMP3), 2006- 2020, which also coincides with the Ninth Malaysia Plan, 2006-2010, which one of the thrusts of the National Mission is to shift the economy upward the value chain by increasing the value added of manufacturing, services and

agriculture sector. In addition, based on Tenth Malaysia Plan, services sector is projected to be the main foundation of economic development as a result of growth in finance and business services, wholesale and retail trade, hotel and restaurants, transport and communication subsectors (Tenth Malaysia Plan).

There are various factors being analysed by researchers as the determinants of profitability of a firm, which include working capital management. In addition, there is also lack of study being conducted on factors contributing towards the profitability of services sector, as compared to determinants of profitability for manufacturing or industrial firms (McDonald, 1999; Leachman, Pegels and Shin, 2005). Hence, in view that services sector had led the economic performance in Malaysia, it is imperative that evaluation on the factors that contribute towards the firm's profitability in services sector being analysed in terms of the effects of working capital management.

In view that one of the financial considerations in business is WCM, there are various empirical research being conducted by researchers on the effects of WCM on profitability of firms (Shin and Soenen, 1998; Deloof, 2003; Lazaridis and Tryfonidis, 2006). However, in Malaysia, the WCM topic has not been extensively being research as compared to other corporate finance studies such as capital structure and capital budgeting, due to WCM is perceived as investment and financing in short time interval (Zariyawati, Taufiq, Annuar and Sazali, 2010). This is also due to short-term financial management has been regarded as less significant and often being overlooked by researchers, which give more emphasis to other parts of corporate finance and investment

despite WCM takes up substantial share of time of the finance managers (Nasruddin, 2006).

Furthermore, based on the researchers' findings, the results are inconsistent for different studies conducted. In addition, despite various studies being undertaken to investigate on the effect of working capital management on the profitability of firms, the results revealed mixed findings and different researchers used different methodology or approach in measuring the working capital management, such as cash conversion cycle (Padachi, 2006), current ratio (Nor Edi Azhar and Noriza, 2010) and net trade cycle (Shin and Soenen, 1998; Erasmus, 2010). Besides that, in Malaysia context, there is limited study being explored in analysing on the effect of working capital management on the firm's profitability especially in the services sector, which is currently the country's highest contributor in terms of GDP in 2010 (57.7%). Furthermore, there is also separate analysis being conducted on the effect of working capital management components and working capital management policy on the profitability of the firms by the researchers.

Therefore, in this study, we would like to investigate on the effectiveness of the policy implemented during the Ninth Malaysia Plan, 2006-2010, and Third Industrial Master Plan, 2006-2020 by analysing on the WCM components and WCM policies that affect the firm's performance in terms of profitability of the services and manufacturing sector during the period of 2006 to 2010. This study is also to fill up the gap by investigating on the effect of working capital management on the firm's profitability in services sector that is represented by trading/services sector and manufacturing sector which is represented by

industrial products sector during the period of 2006 to 2010, which is also in tandem with the implementation of the Ninth Malaysia Plan, 2006-2010 and Third Industrial Master Plan (IMP3) period, 2006-2020.

1.5   Research Questions

This study attempts to fill up the gap of working capital management studies by focusing specifically in services sector and as comparison to the manufacturing sector. Based on the problem statement highlighted, the result of this study is to find out answer for the following identified research questions:-

i)   What is the effect of working capital management components towards the firm's profitability in services and manufacturing sectors during the implementation of the Ninth Malaysia Plan (9MP) and Third Industrial Master Plan (IMP3) from period of 2006 to 2010?

   a)   How does number of days Accounts Receivable (ARD) affects the profitability of the services and manufacturing firms in Malaysia?

   b)   How does number of days Inventories (INV) affects the profitability of the services and manufacturing firms in Malaysia?

   c)   How does number of days Accounts Payable (AP) affects the profitability of the services and manufacturing firms in Malaysia?

   d)   How does cash conversion cycle (CCC) affects the profitability of the services and manufacturing firms in Malaysia?

ii)   What is the working capital management policy being adopted, whether aggressive or conservative Working Capital Investment Policy (WCIP) or

Working Capital Financing Policy (WCFP) being adopted by services and manufacturing sectors during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan (IMP3) from period of 2006 to 2010?

iii) What is the difference in terms of profitability for services sector as compared to manufacturing sector during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan (IMP3) from period of 2006 to 2010?

1.6   Research Objectives

The research objectives of this study are as follow:-

i) To examine the effect of working capital management components on the profitability of services and manufacturing firms in Malaysia during the implementation of the 9MP and IMP3 from period of 2006 to 2010.

   a) To investigate the effect of number of days Accounts Receivable (ARD) towards the profitability of the services and manufacturing firms in Malaysia.

   b) To investigate the effect of number of days Inventories (INV) towards the profitability of the services and manufacturing firms in Malaysia.

   c) To investigate the effect of number of days Accounts Payable (AP) towards the profitability of the services and manufacturing firms in Malaysia.

   d) To investigate the effect of cash conversion cycle (CCC) towards the profitability of the services and manufacturing firms in Malaysia.

ii) To determine on the working capital management policy, whether aggressive or conservative Working Capital Investment Policy (WCIP) or Working Capital Financing Policy (WCFP) being adopted by services and manufacturing sectors during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan (IMP3) from period of 2006 to 2010.

iii) To investigate if there is any significant difference in profitability between services and manufacturing sector during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan (IMP3) from period of 2006 to 2010.

1.7   Purpose and Significance of the Study

The importance of conducting this study is it allows firm managers to expand their learning curve to reduce the possibility of default, especially in turbulent time; in view that working capital management has influence on the profitability performance of the firms.

Furthermore, this study is also of importance for practitioner, policy maker, academician and firm managers with regards to issue associated with the effect of working capital management on profitability of firm, as it enables minimisation of firm's cost of finance and further planning being conducted in order to maximise firm's profitability and shareholders' wealth.

1.8   Scope of the Study

This study focuses on services and manufacturing firms that are continuously listed in the Main Market of Bursa Malaysia that are represented under trading/services and industrial products sectors from year 2006 to 2010 for five years period. In this study, analysis is done based on secondary data obtained from Datastream 5.1 terminal.

1.9   Organisation of the Study

This research project will be organised into five chapters as follows:-

Chapter 1 :   Introduction and overview of the study.

Chapter 2 :   Literature review on the working capital management (WCM), the effect of WCM components and WCM policies towards the profitability of the firms in services and manufacturing sectors.

Chapter 3 :   Research Methodology, which discussed more on research design, research framework, data collection, development of hypotheses and data analysis.

Chapter 4 :   Research Results and Analysis, which refers to the testing of hypotheses and discussion of the results obtained from panel data regression analysis.

Chapter 5 :   Conclusion and recommendations for future research, which also discussed on the limitations and implications of the study.

CHAPTER 2 :   LITERATURE REVIEW

2.0   Introduction

The objective of this chapter is to critically review past theoretical and empirical study conducted with regard to working capital management. There are several studies being carried out by researchers to provide insights on the effect of working capital management towards the firm's profitability.

This chapter starts off with the brief description on the role of working capital management (WCM), followed by optimal WCM, theories of WCM and WCM policy, as well as discussed on the trade-off between liquidity and profitability. Past literature reviews in relation to the effect of WCM on profitability of firms are also elaborated further by dividing the area of study into developed countries, developing countries and in Malaysia's perspectives.

2.1   Role of Working Capital Management (WCM)

Traditionally, corporate finance study has emphasised on long-term financing decision, particularly in capital budgeting, capital structure and dividends (Nobanee, Abdullatif and AlHajjar, 2011), despite the fact that working capital management (WCM) constitutes as one of the financing considerations that a finance manager need to determine, besides capital budgeting and capital structure (Ross, Westerfield and Jordan, 2010). In view of the global financial crisis experienced in 2008, WCM topic has started been given a priority as it relates to managing the firm's resources in order to meet the daily operation of the business (Charitou, Elfani and Lois, 2010). Furthermore, according to

Deloof (2003) and Gill, Biger and Mathur (2010), managing working capital is crucial in view that it has a major and direct influence on firm's profitability.

Working capital management (WCM) is associated with managing short-term financial aspects and it is related to net working capital that involves in determination of financing considerations in short duration, which is within a year or less (Ross, Westerfield, Jordan, 2010). Generally, WCM is simply indicated as managing current assets and current liabilities (Raheman and Nasr, 2007). Working capital refers to short term or current assets that are reflected on firm's balance sheet such as trade receivables and inventory, meanwhile computation of net working capital exclude current liabilities, such as trade payables from the current assets (Eljelly, 2004; Erasmus, 2010). The net working capital plays an important role as it determines the availability of funds in meeting the daily operations of the firm and has impacts towards generating firm's profitability and shareholders' value (Eljelly, 2004).

In addition, based on study conducted by Smith (1980), WCM demonstrates a significant function in view of the trade-off between liquidity and profitability that has impacts on firm's profitability, risk as well as the value of the corporation. Thus, effective utilisation of investment in working capital is vital as an overinvestment in working capital that is not utilised may lead to lower firm's value, while working capital that is underinvested may resulted in firm facing liquidity difficulty. Hence, as a consequence of not having sufficient investment in cash, trade receivables or inventory, it is challenging for firm to

operate its day-to–day operations which may resulted in sales decline and affected the firm's profitability (Erasmus, 2010).

Working capital management (WCM) which is also known as liquidity management is essential in determining the success of a firm as it involves organization of current assets and current liabilities (Uyar, 2009). Hence, should the firm unable to organise its liquidity level, this means that its current asset unable to cover its current liabilities such as short term debts. Thus, firm may resort to external funding which has the possibility of incurring higher cost of financing that may lead to lower profitability (Uyar, 2009) and possibility of becoming insolvency and bankruptcy due to poor credit position (Nasruddin, 2006). As highlighted by Eljelly (2004), efficient liquidity management relates to organising and monitoring of current assets and current liabilities that allow elimination of risk for firms that unable to meet its short-term commitment and at the same time, preventing excessively investment in these assets.

According to Hill and Sartoris (1995), the firm's value can be improved further by having adequate liquidity position as it enable smooth operation of business, enhancement of shareholders' value and offers flexible financial choices at an attractive cost. Furthermore, creditors are also concerned with the firm's liquidity position due to it reflects whether the firm's current assets able to deal with its present current liabilities (Smith and Begemann, 1997). Therefore, WCM study is utmost important in managing the daily operation of the firm.

2.2   Optimal Working Capital Management

The key objective of managing working capital is to achieve an optimum level in each segments of the working capital, such as receivables, inventory and payables (Filbeck and Krueger, 2005, Afza and Nazir, 2007) that enables equilibrium to be maintain between risk and efficiency (Afza and Nazir, 2007). Thus, finance manager has emphasised in maintaining optimal current assets and current liabilities in order to achieve optimal working capital position (Lamberson, 1995) and maximisation of firm's value (Howorth and Westhead, 2003, Deloof, 2003, Afza and Nazir, 2007).

Adequacy of liquidity level is important in order for firm to improve its value as it allows for contingency purposes in operations and offers flexible financing at a lower cost (Eljelly, 2004). In addition, Smith (1980) had highlighted on the WCM goals, which involves the trade-off between liquidity and profitability. Thus, firm needs to balance its liquidity and profitability level as if firm is wholly focussing in profit maximisation, the sufficiency of the firm's liquidity position will be affected and vice versa (Nasruddin, 2006).

2.3   Operating Cycle and Cash Conversion Cycle

The operating cycle of a business refers to a period of time between inventory arrivals until the cash receipts derived from the receivables. Sometimes, operating cycle also include time from placement of order until arrival of the stock (Ross, Westerfield and Jaffe, 2005). Moss and Stine (1993) defined operating cycle as the total of average number of days required to purchase

on credit and sell a product (also known as inventory conversion period) and the average days required to collect sales (receivables conversion period).

Moss and Stine (1993) highlighted that assessment on liquidity position is beneficial via cash conversion cycle. Eljelly (2004) had defined cash gap, also known as cash flow cycle or cash conversion cycle as a period of time between actual cash payment of productive resources and actual cash collection from the sale of products or services. Meanwhile, CCC as defined by Charitou, Elfani and Lois (2010) refers to interval of time between acquisition of raw materials or delivery of services and the cash collected from the sale of goods or services offered. Therefore, the longer the interval of CCC, the higher the working capital being invested, which may leads to high interest expenditure, high risk of defaulting and low profitability (Charitou, Elfani and Lois, 2010). The concept of operating cycle and cash cycle can be explained by Figure 2.3.

Figure 2.3 : Cash Flow Time Line and Short-Term Operating Activities
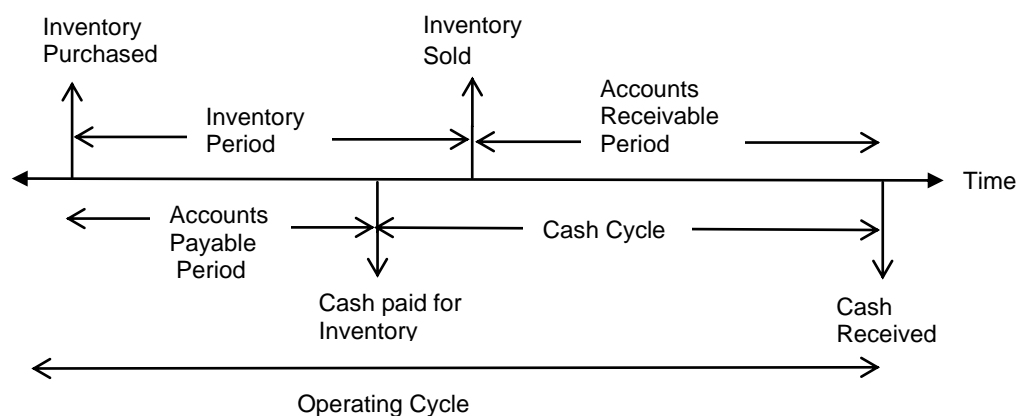
(Source : Ross, Westerfield and Jordan, 2010, p. 583)

According to Ross, Westerfield and Jordan (2010), operating cycle refers to the length of time from procurements of inventory until cash from receivables is accepted. Meanwhile, cash cycle demonstrates the period of time between cash payment and receiving collection of cash (Ross, Westerfield and Jordan, 2010).

Based on Figure 2.3 above, the difference between operating cycle and cash cycle is summarised as below:-

Operating Cycle = Inventory period + Accounts receivable period

Cash Cycle = Operating Cycle – Accounts payable period

(Source : Ross, Westerfield and Jordan, 2010, p.582)

Firms can achieved greater sales by maintaining higher inventory level in order to mitigate the risk of insufficient supply of stock and liberal trade credit policy may motivate further sales as it enable evaluation of product prior to payment (Long, Malitz and Ravid, 1993; and Deloof and Jegers, 1996).

2.4   Theories of Working Capital Management

Based on studies conducted by Moss and Stine (1993); Lancaster et al. (1999); Farris and Hutchison (2002), there are two distinctive aspects of working capital management, which comprise of static or dynamic viewpoints. The static point of view reflects conventional measurement of liquidity ratios, for example current ratio and quick ratio measured at a particular point in time on balance sheet (Moss and Stine, 1993).

Although working capital and liquidity ratios are part of liquidity measurement, they are not left without critics (Eljelly, 2004). As highlighted by Finnerty (1993), conventional liquidity ratios comprise of current ratio or quick ratio which consist both liquid financial assets and operating assets. Hence, as operating assets are held up in operations, it is deemed as not beneficial in terms of on-going concern opinion. Furthermore, current and quick ratios are also not efficient in view of their static nature and incapability of forecasting future cash flows and liquidity (Kamath, 1989). Thus, from the weaknesses identified for working capital and liquidity ratios, net cash conversion cycle or also known as cash gap has been introduced as alternative to liquidity measurement (Gitman, 1974; Richard and Laughlin, 1980; Boer, 1999 and Gentry et al., 1990) as it is more realistic based on the dynamic nature of cash cycles (Eljelly, 2004). Furthermore, the dynamic view computes liquidity of firm's operations continuously, for instance cash conversion cycle that involves both balance sheet and income statement with time perspective (Jose et al., 1996).

Richards and Laughlin (1980) had long established the principle of working management by initiating the idea of cash conversion cycle as a strong performance indicator for management of firm's working capital. Cash conversion cycle (CCC) or cash gap computes the period of time between actual cash expenses and actual cash receipts from the sale of products or services (Eljelly, 2004).

2.5   Working Capital Management (WCM) Policy

The working capital management (WCM) policy is divided into working capital investment policy (WCIP) and working capital financing policy (WCFP). A firm may select an aggressive WCIP, which adopts a lower ratio of total current assets to total assets or select an aggressive WCFP policy that focus in maintaining a higher ratio of total current liabilities to total assets (Afza and Nazir, 2007). On the other hand, an excess of current assets has an inverse relationship with firm's profitability, while lower level of current assets caused lower liquidity position and risk of insufficiency of stock which resulted in challenges to support smooth operation of business (Van Horne and Wachowicz, 2004).

The trade-off between various policies of working capital has long been debated (Pinches, 1991, Brigham and Ehrhardt, 2004, Moyer et. al., 2005, Gitman, 2005). An aggressive working capital policy is related to higher return and higher risk, which is contrary to conservative working capital policies which emphasis on minimising risk and return (Gardner et al. 1986, Weinraub and Visscher, 1998). It was found that the higher the investment in current assets, the lower the risk and profitability incurred. Based on the empirical findings by Carpenter and Johnson (1983), there is no linear relationship found between current assets and systematic risk of US firms.

Weinraub and Visscher (1998) had conducted study on both policies of aggressive and conservative WCM by analysing quarterly data of ten various industries of US firms, during the period of 1984 to 1993. He concluded that there is a balance between adaptations of aggressive working capital on one

hand with a conservative policy at the other hand. Thus, in this study, it is imperative that study is being conducted to also analyse on the effect of working capital management policy towards the firm's profitability.

2.6   Trade-off between Liquidity and Profitability

The working capital of the firm relates to liquidity management, which consists of current assets as indicated on balance sheet of the firm, meanwhile net working capital disregards the current liabilities (Eljelly, 2004). Hence, in ensuring effective liquidity management of the firms, planning and monitoring of current assets and current liabilities are important to meet short-term obligations and to reduce extreme investment in these assets, as it has impact on the profitability and shareholders' value of the firms (Eljelly, 2004).

According to Smith (1980), there is a trade-off between liquidity and profitability, which are the dual goals of working capital management. In view that management of working capital has a significant effect on both liquidity and profitability of the firms, it is important that firms attain an optimal level in efficiency of the working capital management (Nasruddin, 2006). Hence, there should be a balance in liquidity position of the firms that is neither excess nor insufficient. This is due to extreme liquidity level indicates growth of idle funds that disallow firms to enjoy better profit as the reserves of the firms are held up in liquid assets and are not available to be used in operating or investing activities that are able to gain higher profitability. Meanwhile, inadequate liquidity level has an impact on the repayment capability of the firms and

resulted in declining credit position and possibility of becoming insolvent and bankrupt (Nasruddin, 2006). Therefore, by focussing solely on liquidity may lessen the prospective profitability of the firms, while on the other hand, fully prioritising on profit maximization will reduce the opportunity of having sufficient liquidity for the firms (Nasruddin, 2006). Furthermore, based on the theory of risk return, firms with higher liquidity position may faced lower risk and enjoys lower profitability, as compared to firms with low liquidity level that may incur higher risk, which resulted in higher return (Niresh, 2012). Hence, firms need to achieve a balance between liquidity and profitability in the daily operations of their business.

In addition, shorter cash conversion cycle is preferred due to longer cash cycle or cash gap incurs higher external financing cost in terms of explicit and implicit costs that affected the profitability of the firms (Eljelly, 2004). Loeser (1988) had highlighted on the significance of liquidity management by reducing the cash conversion cycle via evaluating the accounts receivable and unbilled revenue at prime rate of the interest rate, in order for receivables collected promptly to reduce the cash gaps. Hence, finance managers of the firms also need to ensure all invoicing, collections and payables systems are operated effectively (Fraser, 1998).

Furthermore, there are many researchers conducted study on the trade-off between liquidity and profitability. However, noted that the result varies based on the study undertaken, which the findings are discussed further and segregated according to developed and developing countries as well as Malaysia perspective as per items 2.7, 2.8 and 2.9.

2.7   Past studies on Working Capital Management and Profitability in Developed countries

Shin and Soenen (1998) had examined on the relationship between the firm's net-trade cycle and profitability via correlation and regression analysis. Based on a Compustat sample of 58,985 listed American firm years during the period of 1975 to 1994, they found a strong negative association between the interval of the firm's net-trade cycle and profitability. The firm's profitability is measured by operating income plus depreciation related to total assets and to net sales. Net- trade cycle (NTC) was used as a measurement for efficiency of WCM instead of CCC due to each of the three segments in WCM such as number of days inventories, accounts receivable and accounts payable are measured based on percentage of sales and assuming other things being equal (ceteris paribus conditions). This is unlike CCC which has various denominators for the three segments and hence, projection on the additional working capital requirement for the corporation is difficult. Their findings also revealed that shorter NTC leads to higher present value of net cash flow and higher shareholders value. Thus, if the firm has shorter NTC, it means that the firm manages its working capital efficiently as the firm requires less external financing which denote an improved financial performance.

Deloof (2003) had investigated on the relationship between working capital management and firms' profitability of 1,009 large Belgian non-financial corporations from 1992 to 1996. His results revealed a significant negative relationship between gross operating income with the number of days accounts receivable, inventories and accounts payable. Hence, from the

result obtained, it is proposed that shareholders value can be enhanced by maintaining a minimum number of days accounts receivable, inventories and accounts payable. Noted that firm's profitability is being represented by gross operating income instead of return on assets as for firm that has mostly financial assets on its balance sheet, the operating activities had less influence to the return on assets.

Lazaridis and Tryfonidis (2006) had studied on the relationship between working capital management and profitability of 131 corporations listed in Athens Stock Exchange during time interval of 2001 to 2004. Their results revealed that there is a negative association between profitability, which is computed using gross operating profit, with cash conversion cycle as indicator for determining the effectiveness of working capital management. Hence, it is suggested that the firm's profitability can be enhanced by managing the cash conversion cycle and maintain its segments such as accounts receivables, accounts payables and inventory at an optimal stage. Gross operating profit represents the measurement for profitability instead of earnings before interest tax depreciation amortization (EBITDA) or pretax profit or net profit due to their intension of establishing an association between accomplishment or collapse of a business operation with operating ratio and associate it further with other operating variables such as cash conversion cycle. Furthermore, financial assets are deducted from total assets in order to eliminate the involvement of finance activity from operation activity, which may affect firm's profit.

Gill, Biger and Mathur (2010) had broadened the study conducted by Lazaridis and Tryfonidis (2006) with regard to the relationship between working capital management and profitability. They have conducted an investigation on the relationship between working capital management and profitability of a sample of 88 American manufacturing firms listed on the New York Stock Exchange for a period of 3 years from 2005-2007 by adopting correlational and non-experimental research design. Based on their observation, there is a negative association between profitability, computed via gross operating profit and average days of accounts receivable. They also found that there is a positive relationship between cash conversion cycle and profitability, while negative relationship discovered between accounts receivables and firm's profitability implied that for less profitable corporations, they will reduce their accounts receivables in order to shorten the cash gap in the CCC. Meanwhile, there is no significant relationship identified between firm size and gross operating profit ratio. Furthermore, it is suggested that the firm's profitability and shareholders value can be enhanced by managing their CCC efficiently and by maintaining their accounts receivables at an optimum position.

Nobanee, Abdullatif and AlHajjar (2011) had studied on the relationship between firm's cash conversion cycle and its profitability for 34,771 Japanese non-financial firms listed on the Tokyo Stock Exchange from the period of 1990 to 2004. By using dynamic panel data analysis, they conclude that there is a strong negative association between the firm's cash conversion cycle and its profitability in all the samples studied apart from consumer goods and

services firms. Based on the results obtained, it is suggested that the profitability of a Japanese corporation can be enhanced by reducing the CCC via reduction in the inventory conversion period or by shortening the receivable collection period or by deferring the payment period to suppliers. Therefore, reduction in the CCC brings improvement on firm's profitability as higher CCC incurs costly external financing.

2.8 Past studies on Working Capital Management and Profitability in Developing countries

Eljelly (2004) had investigated on the relationship between profitability and liquidity, which is computed by current ratio and cash gap or known as cash conversion cycle for a sample of 29 joint stock firms in Saudi Arabia over a period of 1996 to 2000. Based on the correlation and regression analysis, he found a significant negative relationship between profitability and liquidity of the firms that is computed via current ratio, which the association is further apparent in firms with higher current ratios and extended cash conversion cycle. However, cash conversion cycle or cash gap has higher influence in liquidity measurement as compared to current ratio that has impacted the profitability of the firms at industry level.

Afza and Nazir (2007) had examined on the relations between aggressive or conservative working capital policies and profitability together with Pakistani firm's risk level for 208 non-financial public limited firms listed on Karachi Stock Exchange from 17 diverse industrial sectors from 1998 to 2005. Based on cross-sectional regression models among working capital policies,

profitability and risk level, the results showed that there is a negative association between the firms' profitability and the extent of aggressiveness of working capital policies in terms of investment and financing perspectives, which also validates the results of Carpenter and Johnson (1983). Furthermore, it was found that there is also no significant relationship between the current assets and current liabilities with the risk level of the firms. Profitability is measured by return on assets (ROA), return on equity (ROE) and Tobin's Q while working capital policy is divided into investment and financing policies. The aggressive investment policy is measured by total current assets divided by total assets, while aggressive financing policy is computed by total current liabilities divided by total assets.

Uyar (2009) had examined on the relation between the duration of cash conversion cycle (CCC) with firm's size and profitability by analysing sample consist of 166 merchandise and manufacturing firms from seven industries (excluding services companies) listed on the Istanbul Stock Exchange for year 2007. He found that there is a significant negative relationship between CCC with firm size and profitability. Retail/wholesale industry reported the least CCC's mean value with an average of 34.58 days, while textile industry recorded as the topmost/uppermost CCC average of 164.89 days.

Falope and Ajilore (2009) had studied on the impacts of working capital management on profitability of a sample of 50 Nigerian non-financial firms listed on the Nigerian Stock Exchange from 1996 to 2005. Based on the panel data econometrics for pooled regression, they found that there is a significant negative association between net operating profit and the average collection

period, inventory turnover, average payment period and cash conversion cycle. Besides that, they also found that there is no substantial difference between large and small firms on the impacts of WCM. Based on the results obtained, it is suggested that shareholders value can be enhanced if the WCM is efficiently being employed via minimizing the days of accounts receivable and inventories.

Erasmus (2010) examined on relation between working capital management and firm's profitability for both listed and delisted South African industrial firms, listed on the Johannesburg Securities Exchange, which covers a 19 years period from 1989 to 2007. By using a panel data analysis, there are a total of 319 firms (159 listed and 160 delisted) with 3,924 firm-year observations being studied. The reason being for delisted firms that were previously listed being included in the study is to reduce the survivorship biasness. Overall, they found a significant negative relationship between firm's profitability as measured by return on assets with its net trade cycle (NTC), debt ratio and liquidity ratio. However, for delisted firms under period review, the liquidity and debt ratio reveals more significant role than NTC. Hence, it is suggested that firm's profitability can be improved by lowering generally the investment in net working capital.

Charitou, Elfani and Lois (2010) had investigated on the effect of working capital management on firm's profitability of an emerging market, which comprise of a sample of 43 industrial firms listed on Cyprus Stock Exchange for a period of 10 years from 1998 to 2007. By using multivariate regression analysis, they found that working capital management as represented by CCC

and its major segments such as days in inventory, days sales outstanding and creditors payment period have an inverse relationship with firm's profitability, which is measured by return on asset (ROA). The control independent variables are firm's size which is measured by natural logarithm of sales, sales growth and debt ratio. Arising from the recent global financial crisis, the firm's managers and other major stakeholders, particularly investors, creditors and financial analysts need to focus in efficiently utilising the company's resources effectively, due to its impacts towards profitability that enable minimisation of business fluctuation, low risk of defaulting and further improvement in firm's value.

Karaduman, Akbas, Caliskan and Durer (2011) had investigated on the relationship between working capital management and profitability of 127 listed corporations in the Istanbul Stock Exchange from year 2005 to 2009 for five years period by adopting panel data method. Working capital management efficiency is computed by using cash conversion cycle, while profitability is represented by return on assets (ROA). They found that profitability (ROA) can be improved by reducing CCC.

Charitou, Lois and Halim (2012) had investigated on the relationship between working capital management and firm's profitability for an emerging Asian country by focusing on 718 firms listed on the Indonesia stock exchange for 13 year period, 1998-2010. Based on multivariate regression analysis, their findings revealed that CCC and net trade cycle (NTC) have positive relationship with the firm's profitability, while debt ratio measuring firm's

riskiness was found to have negative relationship with firm's profitability, which is determined by Return on Assets (ROA).

2.9 Past studies on Working Capital Management and Profitability in Malaysia

In Malaysia, there are limited studies being conducted on the effect of working capital management on firm's profitability. Zariyawati, Annuar and Abdul Rahim (2009) had carried out study on the effect of working capital management on profitability of 1628 firms from six distinct economic segments listed in Bursa Malaysia during year 1996 to 2006. They found that there is a strong negative significant association between cash conversion cycle and profit achieved by the firms. Thus, based on their finding, firms are able to accomplish higher profitability by shortening their cash conversion phase.

Nor Edi and Noriza (2010) had studied on the working capital management and its impact to the performance of 172 listed firms in Main Board of Bursa Malaysia from the viewpoint of market valuation and profitability from year 2003 to 2007. The result revealed that there are significant negative relationships between working capital segment such as cash conversion cycles, current ratio, current asset to total asset ratio, current liabilities to total asset ratio and debt to asset ratio with firm's performance in terms of firm's value that is measured by Tobin Q and profitability measured via return on asset and return on invested capital. Hence, in order to ensure effectiveness of business operation, firm manager need to take consideration on the

significant contribution attributed by working capital management towards the enhancement of firm's market value and profitability.

Nasruddin (2006) had investigated on the relationship between liquidity and profitability trade-off for a sample of 145 small and medium sized enterprises (SME) involved in manufacturing sector in Malaysia, from the period of 1999 to 2003. Based on his results obtained from non parametric Spearman rank correlation coefficient analysis, it was revealed that there is a moderate positive relationship between liquidity and profitability, which implied that profitable firms have higher liquidity positions. Based on correlation between liquidity and firm size, it was revealed that there is a weak positive correlation, which means that larger small firms enjoy higher liquidity position. By applying Kruskal-Wallis test statistic, the result indicated that there is various degree of liquidity is observed for various industry sectors.

2.10 Summary of Past Studies Findings

The summary of the past studies findings is indicated as per Table 2.10 below.

Table 2.10: Summary of Past Studies Findings

Authors	Sample and Period of Study	Results
Shin and Soenen (1998)	58,985 listed American firm years during the period of 1975 to 1994	Strong negative association between the interval of the firm's net-trade cycle and profitability.
Deloof (2003)	1,009 large Belgian non-financial corporations from 1992 to 1996	A significant negative relationship between gross operating income with the number of days accounts receivable, inventories and accounts payable.
Lazaridis and Tryfonidis (2006)	131 corporations listed in Athens Stock Exchange during time interval of 2001 to 2004	A negative association between gross operating profit, with cash conversion cycle as indicator for effectiveness of working capital management.
Gill, Biger and Mathur (2010)	88 American manufacturing firms listed on the New York Stock Exchange for a period of 3 years from 2005-2007	A negative association between gross operating profit and average days of accounts receivable. They also found that there is a positive relationship between cash conversion cycle and profitability, while negative relationship discovered between accounts receivables and firm's profitability.
Nobanee, Abdullatif and AlHajjar (2011)	34,771 Japanese non-financial firms listed on the Tokyo Stock Exchange from the period of 1990 to 2004	A strong negative association between the firm's cash conversion cycle and its profitability in all the samples studied apart from consumer goods and services firms.
Eljelly (2004)	29 joint stock firms in Saudi Arabia over a period of 1996 to 2000	A significant negative relationship between firm's profitability and liquidity position measured by current ratio and cash gap.
Afza and Nazir (2007)	208 non-financial public limited firms listed on Karachi Stock Exchange from 17 diverse industrial sectors from 1998 to 2005	A negative association between the firms' profitability and the extent of aggressiveness of working capital policies in terms of investment and financing perspectives.
Uyar (2009)	166 merchandise and manufacturing firms from seven industries (excluding services companies) listed on the Istanbul Stock Exchange for year 2007	A significant negative relationship between CCC with firm size and profitability. Retail/wholesale industry reported the least CCC's mean value with an average of 34.58 days, while textile industry recorded as the topmost/uppermost CCC average of 164.89 days.
Falope and Ajilore (2009)	50 Nigerian non-financial firms listed on the Nigerian Stock Exchange from 1996 to 2005	A significant negative association between net operating profit and the average collection period, inventory turnover, average payment period and cash conversion cycle. Besides that, they also found that there is no substantial difference between large and small firms on the impacts of WCM.
Erasmus (2010)	319 firms (159 listed and 160 delisted) South African industrial firms, listed on the Johannesburg Securities Exchange from 1989 to 2007	A significant negative relationship between firm's profitability as measured by return on assets with its net trade cycle (NTC), debt ratio and liquidity ratio.
Charitou, Elfani and Lois (2010)	43 industrial firms listed on Cyprus Stock Exchange for a period of 10 years from 1998 to 2007	Working capital management as represented by CCC and its major segments such as days in inventory, days sales outstanding and creditors payment period have an inverse relationship with firm's profitability, which is measured by return on asset (ROA).

Karaduman, Akbas, Caliskan and Durer (2011)	127 listed corporations in the Istanbul Stock Exchange from year 2005 to 2009	They found that profitability (ROA) can be improved by reducing CCC.
Charitou, Lois and Halim (2012)	718 firms listed on the Indonesia stock exchange for 13 year period, 1998-2010.	CCC and net trade cycle (NTC) have positive relationship with the firm's profitability, while debt ratio measuring firm's riskiness was found to have negative relationship with firm's profitability, which is determined by Return on Assets (ROA).
Zariyawati, Annuar and Abdul Rahim (2009)	1628 firms from six distinct economic segments listed in Bursa Malaysia during year 1996 to 2006.	A strong negative significant association between cash conversion cycle and profit achieved by the firms. Thus, based on their finding, firms are able to accomplish higher profitability by shortening their cash conversion phase.
Nor Edi and Noriza (2010)	172 listed firms in Main Board of Bursa Malaysia from year 2003 to 2007.	A significant negative relationships between working capital segment such as cash conversion cycles, current ratio, current asset to total asset ratio, current liabilities to total asset ratio and debt to asset ratio with firm's performance in terms of firm's value that is measured by Tobin Q and profitability measured via return on asset and return on invested capital.
Nasruddin (2006)	145 SME involved in manufacturing sector in Malaysia, from the period of 1999 to 2003	A moderate positive relationship between liquidity and profitability, which implied that profitable firms have higher liquidity positions.

CHAPTER 3 :   RESEARCH METHODOLOGY

3.0   Introduction

This chapter discusses on the research methodology adopted in the study, which include review of the research design, research framework, type and source of data selected, sampling technique, data collection, application of data analysis techniques to analyze the data obtained and formulation of the research hypotheses.

3.1   Research Design

The research design for this study is based on secondary data collected from firms listed in the Main Market of Bursa Malaysia under trading/services and industrial products sectors from year 2006 to 2010. In this study, the focus is on services and manufacturing sectors, which are represented by trading/services and industrial products sector respectively as both the sectors contributed 85.3% share of Malaysia's GDP in 2010. The time frame of five years data is selected for this study from year 2006 to 2010, which is in conjunction to the emphasis placed by Malaysia's government via Ninth Malaysia Plan and Third Industrial Master Plan (IMP3).

In addition, this research is analyzed using panel data regression, which is a combination of cross-sectional and time-series analysis, in order to make comparison and determination of the effects of WCM towards firms' profitability in the services and manufacturing sectors in Malaysia.

3.2   Research Framework

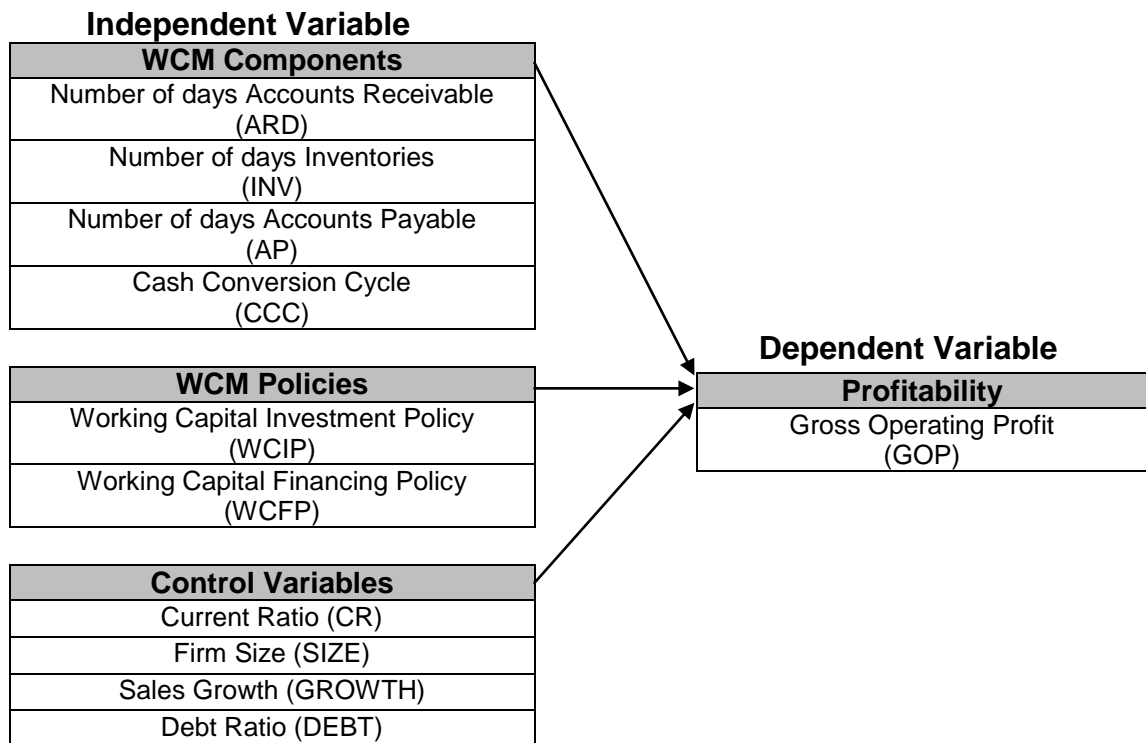The research framework for this study is shown as per Figure 3.2.

Independent Variable

WCM Components
Number of days Accounts Receivable (ARD)
Number of days Inventories (INV)
Number of days Accounts Payable (AP)
Cash Conversion Cycle (CCC)

WCM Policies
Working Capital Investment Policy (WCIP)
Working Capital Financing Policy (WCFP)

Control Variables
Current Ratio (CR)
Firm Size (SIZE)
Sales Growth (GROWTH)
Debt Ratio (DEBT)

Dependent Variable

Profitability
Gross Operating Profit (GOP)

Figure 3.2 : Research Framework

The dependent variable for the study refers to the firm's profitability that is represented by Gross Operating Profit (GOP), while the independent variables refer to working capital management components that are represented by number of days Accounts Receivable (ARD), number of days Inventories (INV), number of days Accounts Payable (AP) and cash conversion cycle (CCC). Meanwhile, working capital management policies are represented by Working Capital Investment Policy (WCIP) and Working Capital Financing Policy (WCFP). The control variables for this framework refer to current ratio (CR), firm size (SIZE), sales growth (GROWTH) and debt ratio (DEBT).

The variables are then analyzed to determine if there is any significant relationship between the dependent and independent variables through Pearson Correlation matrix with the purpose of identification of multicollinearity. Thus, upon addressing the multicollinearity, there are five regression models established in order to determine the effect of the WCM components and WCM policy on the firm's profitability for a sample of 75 firms under trading/services and 143 industrial products firms listed in the Main Market of Bursa Malaysia over a period of five years from year 2006 to 2010.

3.3   Selection of Measures

In this study, there are two types of variables measured; dependent and independent variable, which the details are as follows:-

3.3.1 Dependent Variable : Gross Operating Profit (GOP)

Deloof (2003) had defined profitability as gross operating income that is measured by sales less cash costs of goods sold, and divided by total assets less financial assets, which financial assets refer to shares in other corporations that formed as substantial segment of total assets. According to Deloof (2003), return on assets is not included as profitability measurement in view that for firm that has mostly financial assets on its balance sheet, there is less influence of the firm's operating activity towards the return on assets of the firm. Hence, financial assets are excluded from total assets in the computation of gross operating income.

Other researchers have also supported and applied gross operating profit as measurement of profitability, which is computed as sales less cost of goods sold, divided by total assets less financial assets (Lazaridis and Tryfonidis, 2006; Gill, Biger and Mathur, 2010; Dong and Su, 2010; and Napompech, 2012).

Furthermore, according to Gill, Biger and Mathur (2010), earnings before interest tax depreciation amortization (EBITDA) or pretax profits or net profit are not being used as profitability measurement as they are of the view that financing activity need to be eliminated from operational activity that may have impacts on firm's profitability on the whole and this is also to enable connection formed between the firm's operational performance with operating ratio and cash conversion cycle.

Therefore, in this study, the dependent variable refers to Gross Operating Profit (GOP), which the formula for computation is shown below:-

$$\text{Gross Operating Profit (GOP)} = \frac{\text{Sales} - \text{Costs of goods sold}}{\text{Total Assets} - \text{Financial Assets}}$$

3.3.2 Independent Variable

The independent variables used in the regression model are divided into three parts, which refer to WCM components, WCM policy and control variables, which the detailed description of the independent variables are as per definition below:-

3.3.2.1   Working Capital Management (WCM) Components

Generally, WCM components consist of number of days account receivables (ARD), number of days of inventories (INV), number of days accounts payable (AP) and cash conversion cycle (CCC) as part of inclusive measurement of WCM. Thus, in order to investigate the effect of WCM towards the profitability of a firm in services and manufacturing sectors, WCM measurement such as ARD, INV, AP and CCC have been applied in the panel data regression model, which the descriptions of the WCM components are as per discussion below.

3.3.2.1a   Number of days Accounts Receivable (ARD)

Accounts receivable (ARD) generally refers to average number of days it takes for a corporation to obtain collection of payments from its clients, with the purpose of managing its debtors by reducing the interval of time between sales and collection of payment from clients (Falope and Ajilore, 2009).

Based on study conducted by majority of the researchers, the formula for computation of number of days accounts receivable (ARD) is [Accounts receivable/Sales x 365], which is supported by Deloof (2003); Falope and Ajilore (2009); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Gill, Biger and Mathur, (2010), Sharma and Kumar (2011). Thus, in this study, ARD is measured by:-

$$\text{ARD} = \frac{\text{Accounts Receivable}}{\text{Sales}} \times 365 \text{ days}$$

According to Falope and Ajilore (2009), receivables are related to the firm's credit collection policy, which also reflects the frequency of conversion of receivables into cash that is an important part of the WCM. Thus, by granting trade credit, sales level can be encouraged as it enable ample time for assessment of products by clients before payment (Long, Malitz and Ravid, 1993; and Deloof and Jegers, 1996). However, by granting liberal credit policy to clients, although there is an increase in profitability, but liquidity position of the firm is surrendered (Falope and Ajilore, 2009).

Meanwhile, past literature reviews had reported that there is a significant negative relationship between profitability and ARD (Deloof, 2003; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Gill, Biger and Mathur, 2010; Dong and Su, 2010). Furthermore, Deloof (2003) had provided suggestion that shareholders value can be enhanced further by lessening the number of days of accounts receivable to an acceptable minimum level, while Lazaridis and Tryfonidis (2006) indicated that the profitability of the firms can be improved by lowering the credit interval given to their clients.

3.3.2.1b   Number of days Inventories (INV)

Another component of WCM consists of inventories, which is also known as stock that refers to raw materials, work in progress or finished goods that are pending manufacturing stage or sales, which the INV is computed as (Inventories/Purchases) x 365 (Falope and Ajilore, 2009; Sharma and Kumar, 2011). INV also refers to average number of days the stock is kept by the corporation, which longer INV reflects higher investment in inventory level

(Falope and Ajilore, 2009) that is able to minimize the risk of insufficiency of stock level and lead to greater sales generation (Deloof, 2003). However, on the other hand, higher investment in INV also infers slow turnover in inventory which may impact the firm's profitability.

Meanwhile, according to Deloof, 2003, INV is determined by [inventories x 365]/cost of sales. This is supported by Dong and Su (2010); Gill, Biger and Mathur (2010), Raheman, Qayyum, Afza and Bodla (2010) who had measured INV, which is also known as inventory turnover in days as (Inventory/Cost of Goods Sold x 365 days).

Thus, in view of the unavailability of purchases information in datastream terminal, INV in this study is computed as per following formula:-

$$INV \quad = \quad \frac{Inventory}{Cost\ of\ Goods\ Sold} \quad x\ 365\ days$$

Based on findings by researchers such as Deloof (2003); Falope and Ajilore (2009); Dong and Su (2010), there is a significant negative relationship discovered between number of days inventories (INV) and profitability. Thus, an increase in profitability of a firm can be achieved when the number of days held in inventories is reduced (Dong and Su, 2010).

However, as per study conducted by Capkun, Hameri and Weiss (2009), there is a significant positive relationship found between inventory performance measured by both total inventory and its components, which refer to raw material, work-in-process and finished goods; and financial performance of firms in manufacturing sector that is measured by gross profit

and earnings before interests and taxes (EBIT). Hence, based on the researchers finding, there are two possible indications of relationship, either positive or negative relationship observed between INV and profitability of firm.

3.3.2.1c   Number of days Accounts Payable (AP)

Generally, accounts payable refers to suppliers who had supplied goods or services that have not been paid by clients, which is also known as amount owing to creditors that is deemed as free credit and computed as (Accounts payable/purchases) x 365 (Falope and Ajilore, 2009). This formula is also supported by Deloof (2003) and Raheman, Qayyum, Afza and Bodla (2010), which the number of days accounts payable is also known as average payment period that is assessed as [accounts payable/purchases x 365]. Meanwhile, Lazaridis and Tryfonidis (2006); Dong and Su (2010) and Gill, Biger and Mathur (2010) have computed AP as (accounts payable/cost of goods sold) x 365 days.

Thus, in view of as information on purchases is not available as per datastream terminal, INV in this study is computed as per following formula:-

$$AP = \frac{\text{Accounts Payable}}{\text{Cost of Goods Sold}} \times 365 \text{ days}$$

According to past literature reviews, there is a significant negative relationship established between AP and profitability as reported by Deloof (2003); Falope and Ajilore (2009), which means that less profitable firms delay payment to suppliers in order for firms to make evaluation of the feature or quality of

products, which are also deemed as an economical and adaptable source of finance for firms (Deloof, 2003). However, on the other hand, firms incur high implicit cost via financing granted by suppliers should there be a discount given by suppliers for prompt payment (Falope and Ajilore, 2009). Thus, the higher the investment in current assets, the lesser the risk incurred which also reflects lesser firm's profitability (Falope and Ajilore, 2009).

Nevertheless, there are also researchers who found a significant positive association between AP and firms' profitability, such as Dong and Su (2010), which means that there is a delay in payment by firms with higher profitability. Thus, based on the findings by the researchers, there are two possible indications, either positive or negative relationship found between AP and profitability of firms.

3.3.2.1d   Cash Conversion Cycle (CCC)

Richards and Laughlin (1980) had long established the principle of working capital management by initiating the idea of CCC as a strong performance indicator for organizing the firm's working capital. Short cash conversion cycle denote that the collection of receivables is prompt and the suppliers being paid at a slower pace, which reflects improvement on the effectiveness of its in-house procedures that further translates to greater profitability, greater net present value of cash flow and greater market valuation of an organization (Gentry, Vaidyanathan and Lee, 1990). Meanwhile, Besley and Brigham (2005) define a cash conversion cycle as average period of time taken from

acquisition of raw materials being paid to receivables related with sale being collected.

Cash conversion cycle is deemed as the most dominant and prevalent measurement for efficiency of working capital management (Gill, Biger and Mathur, 2010; and Nobanee, Abdullatif and AlHajjar, 2011). In addition, CCC has also been adopted by other researchers as one of the measurements of WCM in their study such as Moss and Stine (1993); Eljelly (2004); Lazaridis and Tryfonidis (2006); Uyar (2009); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Nor Edi Azhar and Noriza (2010); Charitou, Elfani and Lois (2010); Karaduman, Akbas, Caliskan and Durer (2011); and Charitou, Lois and Halim (2012).

According to Deloof (2003); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Gill, Biger and Mathur, (2010), for a comprehensive determination of WCM, CCC is applied that is computed based on [number of days accounts receivable (ARD) + number of days inventory (INV) – number of days accounts payable (AP)]. The formula for CCC computation is also supported by Nobanee, Abdullatif and AlHajjar, (2011), which measured CCC as [Receivables collection period + Inventory conversion period – Payable deferral period], meanwhile Raheman, Qayyum and Afza (2011) measured CCC as [Receivable turnover in days + Inventory turnover in days – Payables turnover in days).

Thus, in this study, CCC is measured by:-

CCC = Number of days Accounts Receivable + Number of days Inventory –

Number of days Accounts Payable

= ARD + INV – AP

A lengthy CCC level may linked to an increase in sales and subsequently higher profitability gained, but, at the other hand, an extended CCC position may reflects a lower firms' profitability in the event the costs of investing in working capital has escalated beyond the advantages of retaining higher inventory level and providing higher trade of credit to clients (Akinlo, 2012).

Most of the researchers found a significant negative relationship between CCC and profitability (Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Uyar, 2009, Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009; Nor Edi and Noriza, 2010; Nobanee, Abdullatif and AlHajjar, 2011) which indicates that profitability can be increased by reducing the CCC level.

However, Deloof (2003) had found an insignificant negative relationship between CCC and gross operating income under fixed effects estimation model, in view that gross operating income had decreases with an increase in number of days accounts receivable, inventories as well as number of days accounts payable (AP), which have negative relationship with profitability; and AP had been deducted in computation of CCC. The findings by Deloof (2003) is also supported by Akinlo (2012), who found an insignificant negative relationship between CCC and profitability measured by return on assets (ROA) in fixed effects estimation model, which is due to profitability decreases

as a result of an increase in the number of days accounts receivables, inventories and number of days accounts payable that has been deducted in CCC calculation.

Meanwhile, Padachi (2006) had found a positive association between CCC and profitability for Mauritian small manufacturing firms, which the positive relation is further supported by Gill, Biger and Mathur (2010); Charitou, Lois and Halim (2012). Thus, based on the researchers' findings, there is a mixture of positive and negative relationship observed between CCC and firm's profitability.

3.3.2.2   Working Capital Management (WCM) Policy

Working capital management (WCM) plays a vital role as it has impact on the profitability, risk and value of the firm (Smith, 1980). Thus, there is an extensive discussion on the tradeoff between risk and return for diverse working capital policies adopted (Pinches, 1991; Brigham and Ehrhardt, 2004; Gitman, 2005 and Moyer, McGuigan and Kretlow, 2005). Generally, a firm opted for aggressive working capital policies enjoyed greater return or profitability and higher risk level, as compared to a conservative working capital policies which are linked to lesser risk and profitability (Gardner, Mills and Pope, 1986; Weinraub and Visscher, 1998).

WCM policy is divided into Working Capital Investment Policy (WCIP) and Working Capital Financing Policy (WCFP), which the detail of the descriptions are as discussed below.

3.3.2.2a   Working Capital Investment Policy (WCIP)

According to Afza and Nazir (2007) and Nazir and Afza (2009), aggressive investment policy refers to minimum amount being invested in current assets as compared to fixed assets. Meanwhile, on the other hand, a conservative investment policy emphasized on higher share of investment in current assets at the expense of incurring lower profitability (Nazir and Afza, 2009). Thus, an increase in the firm's current assets proportionately to total assets reflects a conservative management style in administering the current assets (Nazir and Afza, 2009). In contrast, as highlighted by Afza and Nazir (2007) and Nazir and Afza (2009), lower working capital investment policy (WCIP) ratio in current assets to its total assets reflects a comparatively aggressive investment policy.

Furthermore, an extreme concentration in current assets has a negative impact on the profitability of firm, while a lower current assets position reflects lower liquidity position and need to deal with the risk of inadequate stock level, which resulted complexity in sustaining business operations efficiently (Van Horne and Wachowicz, 2004).

Afza and Nazir (2007) and Nazir and Afza (2009) had computed the extent of the aggressiveness of working capital investment policy (WCIP) by applying ratio of aggressive investment policy (AIP) formula as total current assets over total assets as applied by Weinraub and Visscher (1998). However, in this study, AIP is also referred to as WCIP, which is represented by the formula below:-

$$\text{WCIP} = \frac{\text{Total Current Assets}}{\text{Total Assets}}$$

Based on the past study conducted by applying a panel data regression models between WCM policies and profitability, Nazir and Afza (2009) had found a negative association between firm's profitability and the extent of aggressiveness of WCIP and WCFP for 204 Pakistani firms in 16 industrial groups listed on the Karachi Stock Exchange for a period of 1998 to 2005. Therefore, if the firms adopted an aggressive WCM policy, the profitability of the firm will decrease. Meanwhile, firm's value can be enhanced further by implementing a conservative approach in managing the WCIP and WCFP.

3.3.2.2b   Working Capital Financing Policy (WCFP)

An aggressive financing policy refers to higher shares of utilization in current liabilities with lower long-terms debt, where a higher ratio of WCFP is associated with comparatively aggressive financing policy (Afza and Nazir, 2007; Nazir and Afza, 2009). Meanwhile, a conservative financing policy emphasized on higher utilization of long-term debt and capital, with a lower consumption in current liabilities (Afza and Nazir, 2007; Nazir and Afza, 2009). In other words, the firms are aggressive in managing their current liabilities when the focus has been on higher utilization of current liabilities, which also affected the liquidity position of the firms (Nazir and Afza, 2009).

Afza and Nazir (2007) and Nazir and Afza (2009) had indicated the formula for aggressive financing policy (AFP) ratio as total current liabilities over total

assets. However, in this study, AFP ratio is also referred as WCFP, which is represented by the formula below :-

$$WCFP = \frac{Total\ Current\ Liabilities}{Total\ Assets}$$

3.3.3 Control Variables

The current ratio, firm size, sales growth and debt ratio variables are included in the regression analysis for control purpose. The control variables are employed to measure the significance of association between variables and to determine the extent of the independent variables influence towards the dependent variables.

3.3.3.1 Current Ratio (CR)

Based on past study conducted by Sharma and Kumar (2011), current ratio has been included in the model as control variable and is computed as current assets divided by current liabilities. Other researchers that had also included current ratio as part of the control variables in the regression model (Charitou, Lois and Halim, 2012). Current ratio has been included in the model regression partly due to its role as measuring liquidity position of the firm traditionally (Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009), as compared to CCC as a dynamic measurements for liquidity management (Jose, Lancaster and Stevens, 1996).

Thus, the formula for computing current ratio is as follows :-

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Higher current ratio is associated with lower profitability and vice versa due to the trade-off relationship between liquidity and profitability. Based on past literature view, Eljelly (2004) had found a significant negative relationship between profitability and liquidity position of firms that is computed by current ratio. Based on study conducted by Charitou, Lois and Halim (2012), there is also a negative relation reported between current ratio and profitability measured by return on assets (ROA).

3.3.3.2   Firm Size (SIZE)

In this study, the effect of firm size on firm's profitability is also being evaluated. The purpose of including firm size in this study as a control variable is to determine the extent of firm size effect on the study of relationship between WCM and firm's profitability.

Larger firms are deemed to have a positive impact on performance in view that larger firms have various capabilities and enjoy economies of scale (Falope and Ajilore, 2009; Akinlo, 2012), faced fewer information irregularity and ability to exploit market power (Akinlo, 2012; Shepherd, 1986) both in product-markets and factor-markets as compared to smaller firms which experienced limitation in obtaining financing and faced higher cost of external funding (Akinlo, 2012). However, on the other hand, larger firms also faced

coordination problems which can negatively influence performance, unlike smaller firms which are simple to monitor and organized (Falope and Ajilore, 2009).

In the past study, there are several forms of definition being adopted in measuring firm size. Based on the past study conducted, the most commonly used measurements for firm size is natural logarithm of sales (Deloof, 2003; Lazaridis and Tryfonidis, 2006; Gill, Biger and Mathur, 2010; Raheman, Afza, Qayyum and Bodla, 2010) and natural logarithm of total assets (Falope and Ajilore, 2009; Nazir and Afza, 2009; Sharma and Kumar, 2011).

In this study, firm size is measured based on natural logarithm of sales, as it is one of the most commonly used proxies for firm size. Furthermore, according to Raheman, Afza, Qayyum and Bodla (2010), the natural logarithm of sales has been applied in computation of size of firms, in view that it is able to lessen the heteroskedasticity and lower the effect of outliers in the regression model.

$$Firm\ Size = \ln(Sales)$$

Based on past literature review, Deloof (2003); Lazaridis and Tryfonidis, 2006; Raheman, Afza, Qayyum and Bodla (2010); Akinlo (2012); Charitou, Lois and Halim (2012) had found a positive relationship between firms size with the profitability of the firms, which indicates that the larger the size of the firms, the higher the firms' profitability in view of the economies of scales enjoyed that has transformed firms to higher profitability. However, on the other hand, according to Evanoff and Fortier (1988) and Michael (1985), there is a

negative effect of firm size on profitability in view that the positive impact on firms' profitability as a result of economies of scale might be partly offset via diversification of assets by firms, which resulted in a lesser risk and lesser return as per the portfolio theory. Therefore, based on past literature review, the expected result on the relationship between firm size and profitability may be positive or negative relationship.

3.3.3.3   Sales Growth (GROWTH)

One of the control variables that is used in the regression by Zariyawati, Annuar, Taufiq and Abdul Rahim (2009) is $(Sales_1 - Sales_0)/Sales_0$ while Deloof (2003) computed sales growth as [(this year's sales – previous year's sales)/previous year's sales]. Other researchers which have also included sales growth as part of the control variables in their studies are Falope and Ajilore (2009) and Nazir and Afza (2009).

Thus, in this study, sales growth is measured by the following formula:

$$\text{Sales Growth} = \frac{Sales_1 - Sales_0}{Sales_0}$$

According to Akinlo (2012), sales growth is anticipated to have a positive relation with profitability in view that higher achievement in sales growth is derived as a result of better quality of product or services, lesser time required to evaluate the quality of the products, which leads to lower accounts receivables days and positive impact on profitability. The positive association between sales growth and profitability is also supported by other researchers (Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009; Raheman, Afza, Qayyum and Bodla, 2010).

3.3.3.4 Debt ratio (DEBT)

Deloof (2003) had also used financial debt ratio as control variable, which is measured by using financial debt divided by total assets, while Gill, Biger and Mathur (2010) defined financial debt ratio as short-term loans plus long-term loans divided by total assets. Furthermore, other researchers that have also included DEBT as control variables had measured debt ratio as total debt over total assets (Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009; Nor Edi Azhar, and Noriza, 2010; Sharma and Kumar, 2011). Hence, in this study, debt ratio is computed using following formula :-

$$\text{Debt ratio} \quad = \quad \frac{\text{Total Debt}}{\text{Total Asset}}$$

According to Charitou, Lois and Halim (2012); they found a significant negative relationship between debt ratio and profitability of the firms, as an increase in debt level raises the interest expense and the possibility of firms defaulting, which profitability is negatively affected. This finding is supported by other studies who also found an inverse significant relationship between debt ratio and profitability (Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009).

3.4 Summary of proxy variables for WCM Measurements

Table 3.4 shows the summary of the selected working capital management variables that has impacts on the profitability of firm. The expected sign of the relationship between the WCM variables and the profitability is also presented.

Table 3.4: Summary of Proxy Variables for WCM Measurements

Variables	Measurement	Expected Sign	Supported by researchers
Number of days Accounts Receivable (ARD)	$\dfrac{\text{Accounts Receivable}}{\text{Sales}} \times 365 \text{ days}$	-	Deloof (2003); Lazaridis and Tryfonidis (2006); Falope and Ajilore (2009); Gill, Biger and Mathur (2010); Dong and Su (2010)
Number of days Inventories (INV)	$\dfrac{\text{Inventory}}{\text{Cost of Goods Sold}} \times 365 \text{ days}$	- +	Deloof (2003); Falope and Ajilore (2009); Dong and Su (2010) Capkun, Hameri and Weiss (2009)
Number of days Accounts Payable (AP)	$\dfrac{\text{Accounts Payable}}{\text{Cost of Goods Sold}} \times 365 \text{ days}$	- +	Deloof (2003); Falope and Ajilore (2009) Dong and Su (2010)
Cash Conversion Cycle (CCC)	$ARD + INV - AP$	- +	Lazaridis and Tryfonidis (2006); Falope and Ajilore (2009); Uyar (2009), Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Nor Edi and Noriza (2010); Nobanee, Abdullatif and AlHajjar (2011) Padachi (2006); Gill, Biger and Mathur (2010); Charitou, Lois and Halim (2012).
Working Capital Investment Policy (WCIP)	$\dfrac{\text{Total Current Assets}}{\text{Total Assets}}$	-/+	Afza and Nazir (2007); Nazir and Afza (2009)
Working Capital Financing Policy (WCFP)	$\dfrac{\text{Total Current Liabilities}}{\text{Total Assets}}$	-/+	Afza and Nazir (2007); Nazir and Afza (2009)
Current Ratio (CR)	$\dfrac{\text{Current Assets}}{\text{Current Liabilities}}$	-	Eljelly (2004); Charitou, Lois and Halim (2012)
Firm Size (SIZE)	$\ln(\text{Sales})$	- +	Evanoff and Fortier (1988); Michael (1985) Deloof (2003); Lazaridis and Tryfonidis, 2006; Raheman, Afza, Qayyum and Bodla (2010); Akinlo (2012); Charitou, Lois and Halim (2012)
Sales Growth (GROWTH)	$\dfrac{\text{Sales}_1 - \text{Sales}_0}{\text{Sales}_0}$	+	Akinlo (2012), Deloof (2003); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Raheman, Afza, Qayyum and Bodla (2010)
Debt ratio (DEBT)	$\dfrac{\text{Total Debt}}{\text{Total Asset}}$	-	Charitou, Lois and Halim (2012); Deloof (2003); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009)

3.5   Development of Hypotheses

Based on the research question and research objectives developed in chapter 1, there are seven hypotheses constructed in this study to investigate on the three key areas which are (i) the effect of WCM components, (ii) the effect of WCM policies towards profitability of firms and (iii) the differences between mean profitability of firms under services and manufacturing sector in Malaysia during the period of 2006 to 2010.

3.5.1 The Effect of WCM components on Profitability of firms

The hypotheses formed to investigate on the effect of WCM components on profitability of firms can be summarized based on following four hypotheses constructed to examine on the effect of number of days Accounts Receivable (ARD), number of days Inventories (INV), number of days Accounts Payable (AP) and Cash Conversion Cycle (CCC) towards profitability of firms under services and manufacturing sector during the period of 2006 to 2010.

The four hypotheses constructed to investigate on the effect of WCM components on firm's profitability, which the null and alternative hypotheses are summarized as follows:-

$H1_o$:   There is no significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

$H1_a$:   There is a significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

H2$_o$: There is no significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

H2$_a$: There is a significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

H3$_o$: There is no significant relationship between Number of days Accounts Payable (AP) and Gross Operating Profit (GOP) of the firms.

H3$_a$: There is a significant relationship between Number of days Accounts Payable (AP) and Gross Operating Profit (GOP) of the firms.

H4$_o$: There is no significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

H4$_a$: There is a significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

3.5.2 The Effect of WCM policy on Profitability of firms

The null and alternative hypotheses to investigate on the effect of WCM policy that are divided into WCIP and WCFP towards the profitability of the firms are summarized as follows:-

H5$_o$: There is no significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

H5$_a$: There is a significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

H6$_o$: There is no significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

H6$_a$: There is a significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

3.5.3 The differences between mean profitability of firms under Services and Manufacturing sector in Malaysia

The null and alternative hypotheses to investigate on the differences between mean profitability of firms under services and manufacturing sector in Malaysia are summarized as follows:-

H7$_0$: There is no significant difference between the mean profitability of services sector and manufacturing sector.

H7$_a$: There is a significant difference between the mean profitability of services sector and manufacturing sector.

3.6 Sampling Technique / Design

In this study to investigate on the effect of WCM components and WCM policy towards the profitability of firms, non-probability sampling technique has been adopted in view that the selection of the elements in the population as sample have unknown probability and no pre-arranged opportunity of being selected, which one of the non-probability designs refers to purposive sampling (Sekaran and Bougie, 2010). Purposive sampling refers to a non-probability sample that corresponds to specific criterion stipulated, whereby one of the

types is known as judgment sampling (Cooper and Schindler, 2006; Sekaran and Bougie, 2010).

Therefore, in this study, judgment sampling has been applied due to the sample is selected based on certain criteria that had been identified as per the section on data collection method, such as the sample of companies selected must be continuously listed in the Bursa Malaysia between the periods of 2006 to 2010 and firms with missing data are omitted from the sample of study. This is further supported by study conducted by Falope and Ajilore (2009), who had also selected purposive sampling in their study as they had excluded firms with missing data and newly listed firms when investigating on the effect of WCM on profitability for a panel of a sample of 50 Nigerian firms listed on the Nigerian Stock Exchange during 1996 to 2005.

As of 6th October 2012, based on datastream terminal and Bursa Malaysia website, there are 182 firms listed in the Main Market of Bursa Malaysia under trading/services sector, meanwhile there are 248 firms listed under industrial products sector, which represents the population of firms in the services and manufacturing sectors respectively. Thus, after taken into consideration removal of firms with missing or incomplete data from the population, the sample of the study consists of 75 firms listed under trading/services sector, which represents services sector, while 143 firms listed under industrial products sector representing manufacturing sector. Data is later analyzed by using Eview software version 7.0.

3.7   Types and Sources of Data

The sample of this study is obtained from secondary data source of firms listed in the Main Market of Bursa Malaysia under trading/services and industrial products sectors. The period of study selected is for five years period, from year 2006 to 2010, which is in tandem Ninth Malaysia Plan, 2006-2010 and the Third Industrial Master Plan (IMP3).

The source for this secondary data is derived from the following sources:-

1.   Subscribed datastream terminal 5.1 in University Malaya library

2.   The Bursa Malaysia website

3.   The Bank Negara Malaysia website

4.   The Economic Report of Malaysia website

3.8   Data Collection Method

The sample of firms selected for analysis is based on the following criteria:-

1.   The firm is a listed company on the Main Market of Bursa Malaysia under trading/services or industrial products sectors and has both complete financial statements and annual reports that allow analysis on the financial data being conducted during the period of 2006 to 2010.

2.   Based on annual report and financial statements of trading/services and industrial products firms, financial data required are retrieved from Datastream terminal 5.1, such as annual revenue, accounts receivable period, inventory turnover period, accounts payable period, current ratio and debt ratio for the period of 2006 to 2010.

3. The shares of the firms are frequently traded in the market which will reduce the thin trading effect and biasness in the analysis.

4. The sample of companies selected must be continuously listed in the Main Market of Bursa Malaysia between the period of 2006 to 2010. Firms with missing data are omitted from the sample of study, which leaves us with a sample of 75 trading/services firms and 143 industrial products firms, which represents services and manufacturing sector respectively.

3.9   Data Analysis Techniques

In this study, panel data regression analysis has been adopted due to it assumptions that firms are heterogenous, fewer multicolinearity problems between variables and higher degree of freedom, which resulted in higher efficiency of the estimator (Baltagi, 2001).

Balanced panel data has been used in this study in view of the characteristic of data used, which involves both cross sections and time series. According to Hsiao, Mountain and Ho-Illman (1995), one of the main advantages of using panel data sets is improvement in the efficiency of econometric estimates, in view that panel data has higher degrees of freedom and various sample flexibility than cross-sectional data that may be observed as a panel with T=1, or time series data with a panel of N=1.

Panel data models are estimated upon determining the correlation between unobservable heterogeneity η_i of each firm and the explanatory variables, which the fixed or random effects selection is by applying Hausman (1978)

test under null hypothesis $E(\eta_i/X_{i,t}) = 0$ (Falope and Ajilore, 2009). Thus, fixed effects method is selected as compared to the random effects estimation in view that based on Hausman test result, as reflected by the Chi-Square statistic revealed mostly significant at 0.01 levels in all the models. In all the regression models, the standard errors are computed by applying White's correction for heteroscedasticity, as adopted in the study by Deloof (2003) and Padachi (2006).

Based on the past literature review, there are researchers who had adopted the panel data methodology in their researches (Deloof, 2003; Falope and Ajilore, 2009; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009).

3.10 Panel Data Regression Model

There are five panel data regression models developed in order to test on the hypotheses developed on the effect of WCM components and WCM policy towards firm's profitability measured by GOP. In this study, the regression models are derived based on model developed by Sharma and Kumar (2011).

However, the model is slightly modified and expanded by incorporating the effects of WCM policy towards the profitability of firms in services and manufacturing sectors in Malaysia, by adding in WCIP and WCFP variables in the model, which are derived as per study carried out by Afza and Nazir (2007).

The model is further supported by researchers which have analyzed the effect of individual WCM components separately towards the profitability of firms,

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such as Deloof (2003), Padachi (2006), Falope and Ajilore (2009), Gill, Biger and Mathur (2010), Akinlo (2012).

This study also used balanced panel data regression model in analyzing on the effect of WCM components and WCM policy adopted by firm i in period t towards the firm's profitability in trading/services and industrial product sectors in Malaysia during the period of 2006 to 2010. Thus, there are five panel data regression models formed for this study to test on the hypotheses developed.

Model 1 : **The effect of ARD on profitability of firms**

$GOP_{i,t}$ = $\beta_0 + \beta_1 ARD_{i,t} + \beta_2 CR_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 DEBT_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t}$

Model 2 : **The effect of INV on profitability of firms**

$GOP_{i,t}$ = $\beta_0 + \beta_1 INV_{i,t} + \beta_2 CR_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 DEBT_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t}$

Model 3 : **The effect of AP on profitability of firms**

$GOP_{i,t}$ = $\beta_0 + \beta_1 AP_{i,t} + \beta_2 CR_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 DEBT_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t}$

Model 4 : **The effect of CCC on profitability of firms**

$GOP_{i,t}$ = $\beta_0 + \beta_1 CCC_{i,t} + \beta_2 CR_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 DEBT_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t}$

Model 5 : **The effect of WCIP and WCFP on profitability of firms**

$GOP_{i,t}$ = $\beta_0 + \beta_1 WCIP_{i,t} + \beta_2 WCFP_{i,t} + \beta_3 CR_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 DEBT_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t}$

Where profitability of the firms refer to GOP, while *i* stands for the *i*th firm, *t* stands for year *t,* and the variables are defined as follows:-

$GOP_{i,t}$	:	Gross Operating Profit of firm *i* at time *t*
$ARD_{i,t}$	:	Number of days Accounts Receivable of firm *i* at time *t*
$INV_{i,t}$	:	Number of days Inventories of firm *i* at time *t*
$AP_{i,t}$	:	Number of days Accounts Payable of firm *i* at time *t*
$CCC_{i,t}$	:	Cash Conversion Cycle of firm *i* at time *t*
$WCIP_{i,t}$	:	Working Capital Investment Policy of firm *i* at time *t*
$WCFP_{i,t}$	:	Working Capital Financing Policy of firm *i* at time *t*
$CR_{i,t}$	:	Current Ratio of firm *i* at time *t*
$SIZE_{i,t}$	:	Firm Size of firm *i* at time *t*
$GROWTH_{i,t}$	:	Sales Growth of firm *i* at time *t*
$DEBT_{i,t}$	:	Debt ratio of firm *i* at time *t*
β_0	:	Intercept coefficient
η_i	:	Individual firm effect assumed constant for firm *i* over *t*
λ_t	:	Time specific effect assumed constant for given *t* over *i*
$\varepsilon_{i,t}$	:	Time varying disturbance term serially uncorrelated with mean zero and variance 1. Random error term for firm *i* at time *t*

CHAPTER 4 :   RESEARCH RESULTS AND ANALYSIS

4.0   Introduction

This chapter discussed on the results obtained from the panel data regression analysis based on fixed effects estimation. Discussions on the results started with descriptive statistic, Pearson's correlation analysis and followed by the balanced panel data regression analysis using the fixed effects estimation for the services and manufacturing firms. An analysis of the results obtained with comparison of the findings gathered from other previous literature review is also being carried out.

Panel (or longitudinal) data are used in this study as it includes both time-series and cross-sectional data, which similar variables are observed from similar cross-sectional sample from various duration of time (Studenmund, 2011). Fixed effects estimation is selected in the analysis in view that one of the benefits is that it prevents the biasness of variables that has been excluded which has fixed period of time or also known as "unobserved heterogeneity or a fixed effect" (Studenmund, 2011).

The data used in this study are obtained from a sample of 75 companies listed under the Main Market of trading/services sector and a sample of 143 companies listed under the Main Market of industrial products sector for the period of 2006 to 2010, which represents the services and manufacturing sector respectively. The analysis of the sample of firms listed under

trading/services and industrial products sector are examined by applying the statistical package of EViews version 7.0.

Subsequently, the effect of WCM components and WCM policies on the profitability of firms; and the differences in mean profitability of firms in the services sector and manufacturing sector are investigated by testing on the hypotheses developed earlier in Chapter 3. There are nine Appendices for this study as listed in the Appendices section for reference.

4.1   Services Sector

The detailed list of firms under trading/services (services) sector is indicated as per Appendix 1. There are 75 companies included in the sample of analysis, out of a total of 182 firms listed under trading/services sector in the Main Market of Bursa Malaysia as of 6th October 2012, based on datastream terminal and Bursa Malaysia websites.

4.1.1 Descriptive Statistics

The detailed descriptive statistics for services sector which refers to firms under trading/services is presented under Appendix 2, whilst the summary of the key descriptive statistics for the dependent and independent variables are summarized in Table 4.1.1 below, which presents descriptive statistics for 75 trading/services firms for a period of five years from 2006 to 2010, which has a total of 375 firm-year observations.

Table 4.1.1: Summary of Descriptive Statistics for Services Sector

Variable	Mean	Median	Maximum	Minimum	Std Deviation
GOP	0.213	0.165	1.024	-0.063	0.179
ARD	158.859	111.0	1885.0	4.0	181.362
INV	106.819	48.0	1628.0	1.0	180.262
AP	85.011	61.460	536.330	2.780	86.027
CCC	180.666	119.930	2876.280	-436.330	276.134
WCIP	0.473	0.450	0.950	0.100	0.209
WCFP	0.304	0.260	0.940	0.030	0.184
CR	2.105	1.570	12.750	0.180	1.639
SIZE	12.691	12.500	17.230	9.170	1.741
GROWTH	0.155	0.074	17.837	-0.805	0.989
DEBT	0.246	0.240	0.770	0.000	0.165
Observations	375	375	375	375	375

Based on Table 4.1.1, the average profit of the services firms as indicated by GOP is 21.3% (median 16.5%). The minimum value for GOP is reported as negative 6.3% with highest profitability reported as 102.4%, whereby the standard deviation of GOP is indicated as 17.9%, which means that GOP value can deviate from mean of both sides by 17.9%.

For WCM components, noted that ARD has the highest mean value of 159 days, followed by INV with average of 107 days, while AP reported average of 85 days, which resulted in average CCC of 181 days that is around 6 months period. These reflect that services sector firms receive payment from sales proceeds on average of 159 days with standard deviation of 181 days, which the minimum collection period from receivables proceeds is 4 days with maximum period of 1,885 days. Furthermore, firms take an average of 107 days to sell inventory with standard deviation of 180 days, which the median for inventory conversion to sales is 48 days. Meanwhile, firms pay their purchases an average of 85 days with standard deviation of 86 days, which the minimum period reported as 3 days and maximum period is 536 days.

Reportedly, CCC as a measure of efficiency in working capital management has an average of 181 days with median of 120 days.

In terms of WCM policy, the average value of WCIP is reported as 47.3% of total assets, while WCFP recorded an average of 30.4% of total assets. The average current ratio of services firms is reported as 2.1, while the mean size of the company is 12.7. Meanwhile, the average sales growth and debt ratio are reported as 15.5% and 24.6% respectively.

4.1.2 Pearson's Correlation Analysis

Pearson's Correlation analysis is also being conducted in order to determine on the relationship between the independent and dependent variables such as the WCM components, WCM policy and control variables towards the profitability of the firms that is measured by GOP. Furthermore, based on the Pearson's correlation matrix, it also allows detection of any problem of multicollinearity (Falope and Ajilore, 2009). Multicollinearity can be identified if there is high (not perfect) correlation between two or more independent variables (Wooldridge, 2003). The detailed results of Pearson's correlation matrix for firms under services sector from year 2006 to 2010 is presented under Appendix 3 and summarized per Table 4.1.2.

Table 4.1.2: Pearson's Correlation Matrix of Services Sector

	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
GOP	1										
ARD	-0.317*** (-6.460)	1									
INV	-0.124** (-2.420)	0.304*** (6.172)	1								
AP	-0.140*** (-2.734)	0.464*** (10.116)	0.063 (1.224)	1							
CCC	-0.246*** (-4.898)	0.711*** (19.525)	0.833*** (29.081)	0.034 (0.667)	1						
WCIP	0.062 (1.205)	0.230*** (4.573)	-0.082 (-1.596)	0.078 (1.509)	0.073 (1.420)	1					
WCFP	-0.092* (-1.786)	0.301*** (6.086)	-0.043 (-0.835)	0.342*** (7.025)	0.063 (1.214)	0.473*** (10.369)	1				
CR	0.092* (1.787)	-0.091* (-1.770)	-0.030 (-0.579)	-0.255*** (-5.088)	-0.0001 (-0.002)	0.218*** (4.307)	-0.551*** (-12.754)	1			
SIZE	0.079 (1.539)	-0.391*** (-8.214)	-0.237*** (-4.705)	-0.204*** (-4.033)	-0.348*** (-7.167)	-0.198*** (-3.902)	-0.084* (-1.627)	-0.184*** (-3.614)	1		
GROWTH	0.009 (0.169)	-0.131*** (-2.558)	-0.090* (-1.749)	-0.046 (-0.882)	-0.131*** (-2.550)	0.017 (0.321)	0.060 (1.160)	-0.047 (-0.916)	0.056 (1.090)	1	
DEBT	-0.267*** (-5.347)	0.158*** (3.090)	0.019 (0.359)	0.029 (0.567)	0.107** (2.074)	-0.244*** (-4.849)	0.282*** (5.670)	-0.423*** (-9.025)	0.159*** (3.120)	-0.050 (-0.966)	1

Notes:
* indicates correlation is significant at the 10% level, ** indicates correlation is significant at the 5% level, *** indicates correlation is significant at the 1% level. t-statistic is reported in the parentheses.

Based on Table 4.1.2, there are high correlation values observed between CCC and ARD as the correlation is 0.711 and between CCC and INV with high correlation reported as 0.833. Thus, there is a multicollinearity problem in developing regression that includes all the independent and control variables into one liner regression as the correlation is higher than 0.7 (Pallant, 2009; Reimann, Filzmoser, Garrett and Dutter, 2008). However, this problem of multicollinearity is being mitigated by not including the variables of CCC, ARD and INV together in a similar regression model since there are highly correlated. Furthermore, one of the disadvantages of using Pearson correlation in analysis is due to its inability in identifying the causes from

consequences (Deloof, 2003). According to Akinlo (2012), Pearson correlation also does not offered a consistent indication of the relationship as the association of each variable with the other independent variables has not been taken into consideration in the evaluation of the simple bivariate correlations.

Thus, five panel data regression models have been developed to investigate on the individual effect of WCM components (ARD, INV, AP, CCC) and WCM policy (WCIP and WCFP) in services sector, which analysis have been conducted separately towards the firms' GOP as dependent variable.

4.1.3 Testing of Hypotheses

Based on the seven hypotheses and five panel data regression models developed earlier in Chapter 3, the hypotheses are tested by examining on the effect of WCM components such as ARD, INV, AP, CCC on profitability of the firms as illustrated as per Model 1, 2, 3 and 4; while the effect of WCM policy as indicated by WCIP and WCFP on profitability of the firms are reflected as per Model 5 in Table 4.1.4.

4.1.4 The Effect of Working Capital Management (WCM) components on Profitability of firms in Services sector

The results of the effect of WCM components on profitability of firms in the services sector are reflected as per Eview output as per Appendix 4, while the summary of the panel data regression analysis is presented under Table 4.1.4.

Table 4.1.4: Panel Data Regression Analysis of Services sector

Dependent Variable : Gross Operating Profit (GOP)					
Regression Method : Panel Least Squares (Fixed Effects Estimation)					
Period : 2006 to 2010					
Model	**1**	**2**	**3**	**4**	**5**
C	-0.149*** (-2.885)	-0.471*** (-7.190)	-0.401*** (-4.590)	-0.255*** (-6.723)	-0.354*** (-8.768)
ARD	-0.0001*** (-4.665)				
INV		6.88E-05*** (2.887)			
AP			7.78E-05 (0.917)		
CCC				-3.22E-05*** (-5.083)	
WCIP					-0.040** (-2.090)
WCFP					-0.012 (-0.210)
CR	-0.015*** (-4.971)	-0.014*** (-4.512)	-0.014*** (-3.680)	-0.014*** (-4.626)	-0.014*** (-3.218)
SIZE	0.034*** (9.439)	0.058*** (11.198)	0.052*** (8.452)	0.041*** (14.810)	0.051*** (19.446)
GROWTH	0.002 (1.460)	0.0008* (1.830)	0.001** (2.205)	0.002** (1.959)	0.002*** (3.029)
DEBT	-0.068** (-1.973)	-0.119*** (-3.154)	-0.107*** (-3.216)	-0.088*** (-2.517)	-0.106*** (-2.923)
R-squared	0.938	0.936	0.935	0.936	0.935
Adjusted R-squared	0.922	0.919	0.918	0.918	0.918
F-statistic	56.722***	54.534***	53.988***	54.289***	53.104***
Hausman Test (Chi-Sq. Statistic)	17.758***	21.092***	20.225***	17.495***	17.322***

Note :
Results obtained using fixed effects method estimation and t-statistic is shown in parentheses under the coefficients with symbol * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

Based on Model 1 in Table 4.1.4, there is a strong negative relationship found between ARD and GOP, which is evidenced by negative coefficient of -0.0001 at significance level of 0.01. This result revealed that an increase in the number of days accounts receivable (ARD) by a day has reduced the firm's GOP by -0.01%, which the result is consistent with the other previous literature review conducted that had also revealed a significant negative

relationship between profitability and ARD (Deloof, 2003; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Gill, Biger and Mathur, 2010; Dong and Su, 2010).

Based on the hypotheses developed to examine on the effect of ARD on GOP:-

H1$_o$:   There is no significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

H1$_a$:   There is a significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 1 above, the null hypothesis of H1$_o$ is rejected. Therefore, there is a significant negative relationship between ARD and GOP of firms under services sector, which is consistent with results obtained by previous researchers.

According to Model 2 in Table 4.1.4, it is revealed that INV has a significant positive relationship with GOP at 0.01 significant levels or 99% confidence interval, which indicates that an increase of the number of days inventories (INV) by a day has increased the GOP of the firms by 0.007%. The result found is consistent with the study conducted by Capkun, Hameri and Weiss (2009), which also revealed a significant positive relationship between inventory performance measured by both total inventory and its components, which refer to raw material, work-in-process and finished goods; and financial performance of firms in manufacturing sector that is measured by gross profit and earnings before interests and taxes (EBIT).

Based on the hypotheses developed to examine on the effect of INV on GOP:-

H2$_o$: There is no significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

H2$_a$: There is a significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

Therefore, based on the result obtained in Model 2 above, the null hypothesis of H2$_o$ is rejected. Hence, there is a significant positive relationship between INV and GOP of firms in services sector during the period of 2006 to 2010.

Based on Model 3 in Table 4.1.4, AP reported an insignificant positive relationship with GOP, which implies that GOP is increased by 0.008% by lengthening a day of the accounts payable (AP). Although the result obtained contradicts with some of the earlier studies that revealed a negative relation between AP and profitability (Deloof, 2003; Falope and Ajilore, 2009), however, the result is supported by study conducted by Dong and Su (2010), who had found a significant positive association between AP and profitability, which means that there is a delay in payment by firms with higher profitability. The positive relationship between AP and GOP of the firms may also be due to firms relied on the trade credit granted by suppliers, which by delaying the payment has resulted in higher sales by selling the products or services and thus, achieved higher profitability.

Based on the hypotheses developed to examine on the effect of AP on GOP:-

H3$_o$:   There is no significant relationship between Number of days Accounts

       Payable (AP) and Gross Operating Profit (GOP) of the firms.

H3$_a$:   There is a significant relationship between Number of days Accounts

       Payable (AP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 3 above, the null hypothesis of H3$_o$ is accepted. Therefore, there is a positive relationship but not significant relationship between AP and GOP of firms under services sector.

Based on Model 4 in Table 4.1.4, CCC has a strong negative relationship with GOP, which indicates that there is a decrease in GOP by 0.003% by lengthening the cash conversion cycle (CCC) at 0.01 significant levels. This means that by reducing the CCC resulted to increase in firm's profitability. Furthermore, the inverse relationship found between CCC and GOP is consistent with the past studies conducted that revealed a highly significant negative relationship between CCC and GOP, which is supported by Lazaridis and Tryfonidis (2006); Falope and Ajilore (2009); Uyar (2009), Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Nor Edi and Noriza (2010); Nobanee, Abdullatif and AlHajjar (2011), that indicates that profitability can be increased by reducing the CCC level.

Based on the hypotheses developed to examine on the effect of CCC on GOP:-

H4$_o$: There is no significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

H4$_a$: There is a significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 4 above, the null hypothesis of H4$_o$ is rejected. Therefore, there is a significant negative relationship between CCC and GOP of firms for the services sector during period of 2006 to 2010. Hence, the firm's profitability can be increased by reducing the CCC to an optimum level.

Overall, based on the results derived from Model 1 to Model 4 in Table 4.1.4, it is suggested that the firm's finance manager can increase the profitability of the firm by reducing the ARD and CCC; and increasing the INV level, which results reveal that ARD, CCC and INV which are part of WCM components have a significant relationship with profitability of the firms.

4.1.5 The Effect of Working Capital Management (WCM) policies on Profitability of Firms in Services Sector

Based on Model 5 in Table 4.1.4, the working capital investment policy (WCIP) of the firms in services sector reveals a statistically negative relationship with GOP of the firms at 0.05 significant level. This result implies that there is a positive relationship between WCIP and GOP of the firms,

which means that as the WCIP ratio as reflected by total current assets to total assets decreases, there is an increase in the degree of aggressiveness of WCIP, which resulted in an increase in the GOP of the firms. Hence, by adopting an aggressive WCIP, it has resulted in an increase in profitability of firms in the services sector. The negative coefficient of the WCIP result is similar to the findings obtained from the study conducted by Hussain, Farooq and Khan (2012).

Based on the hypotheses developed to examine on the effect of WCIP on GOP of firms:-

$H5_o$: There is no significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

$H5_a$: There is a significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the results reflected in Model 5 in Table 4.1.4, the null hypothesis of $H5_o$ is rejected, in view that there is a significant negative relationship found between WCIP and GOP of firms in services sector during period of 2006 to 2010, which reflects an increase in profitability for firms adopting an aggressive WCIP policy. The negative coefficient of WCIP also denotes a positive association between the degree of aggressiveness of investment policy and profitability. The result derived is consistent to the findings obtained from the study conducted by Hussain, Farooq and Khan (2012).

However, on the other hand, the working capital financing policy of the firms as represented by WCFP reflects a statistically insignificant negative relationship with GOP of the firms, which indicates that there is a drop in GOP by 1.2% by adopting an aggressive WCFP. The negative coefficient of WCFP also indicates the negative relation between the degree of aggressiveness of working capital financing policy and profitability. This means that the higher the WCFP ratio as reflected by total current liabilities to total assets ratio, the more aggressive the WCFP that resulted in lower GOP for the firms.

Based on the hypotheses developed to examine on the effect of WCFP on GOP of firms:-

$H6_o$: There is no significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

$H6_a$: There is a significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 5 above, the null hypothesis of $H6_o$ is accepted. Therefore, despite there is a negative relationship between WCFP and GOP of firms in services sector, which indicates a decrease in the profitability of the firms, but the effect is not significant for firms adopting an aggressive policy. The result derived is similar to the findings obtained from the study conducted by Hussain, Farooq and Khan (2012).

4.1.6 The Effect of Control variables on Profitability of Firms

There are four control variables used in the analysis of panel data regression models, which are CR, SIZE, GROWTH and DEBT. Overall, current ratio (CR) showed a significant negative relationship at 0.01 level of significant in all the panel data regression models in Table 4.1.4, which indicates that an increase in the current ratio as a proxy for liquidity level of the firms resulted in reduction of firms' profitability. The result obtained is consistent with the study on trade-off between liquidity and profitability as highlighted by Eljelly (2004); Charitou, Lois and Halim (2012).

Meanwhile, other control variable such as SIZE of the firms has reported a statistically significant positive relationship with GOP at 0.01 significant levels in all the panel data regression models from Model 1 to Model 5, which the results are consistent with other previous studies conducted by Deloof (2003); Lazaridis and Tryfonidis, 2006; Raheman, Afza, Qayyum and Bodla (2010); Akinlo (2012); Charitou, Lois and Halim (2012). This indicates that the larger the size of the firms, the higher the profitability achieved as the firms are able to reap the benefit of economies of scales and obtain easier funding to expand the business.

The sales growth (GROWTH) of the firms under services sector reported a positive relationship with significance level of 0.10 in Model 2, 0.05 significance levels in Model 3 and 4; and 0.01 level of significant in Model 5. The result is consistent with the findings by Akinlo (2012), Deloof (2003); Zariyawati, Annuar, Taufiq and Abdul Rahim (2009); Raheman, Afza, Qayyum

and Bodla (2010) who had found a positive association between GROWTH and profitability of firms.

The services sector firms had reported a strong inverse relationship between DEBT and GOP with high significance level at 0.05 in Model 1 and 0.01 significant level in Model 2, 3, 4 and 5, which the results derived are consistent with other previous literature reviews (Charitou, Lois and Halim, 2012; Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009). Thus, the significant negative relationship indicates that an increase in debt level raises the interest expense and the possibility of firms defaulting, which profitability is negatively affected.

4.1.7 Overall Regression Analysis

Overall, the firms under services sector reported R-squared (R^2) that ranges between 93.5% and 93.8% as reflected in the five panel data regression models, which indicate that the variation of the GOP has been explained by the independent variables between 93.5% and 93.8% in the respective regression models.

Meanwhile, there is a statistically high significant level of F-Statistic that varies between 53.104 to 56.722 at significance of 0.01 level. This means that the overall variations in GOP of the firms are explained between 53.10% and 56.72% of the independent variables in the respective regression models.

Panel data models are estimated upon determining the correlation between unobservable heterogeneity η_i of each firm and the explanatory variables, which the fixed or random effects selection is by applying Hausman (1978) test under null hypothesis $E(\eta_i/X_{i,t}) = 0$ (Falope and Ajilore, 2009). Thus, fixed effects method is selected as compared to the random effects estimation in view that based on Hausman test result, as reflected by the Chi-Square statistic revealed mostly significant at 0.01 levels in all the models. This means that null hypothesis $E(\eta_i/X_{i,t}) = 0$ is rejected. Thus, fixed effects model estimation on panel least square method is selected for the regression.

4.2 Manufacturing Sector

The detailed list of firms under industrial products sector (manufacturing) sector is indicated as per Appendix 5. There are 143 companies included in the sample of analysis, out of a total of 248 firms listed under industrial products sector in Main Market of Bursa Malaysia as of 6th October 2012, based on datastream terminal and Bursa Malaysia websites.

4.2.1 Descriptive Statistics

The detailed descriptive statistics for manufacturing sector, which also refers to industrial products sector is presented under Appendix 6, whilst the summary of the key descriptive statistics for the dependent and independent variables are summarized in Table 4.2.1 below, which presents descriptive statistics for 143 industrial products firms for a period of five years from 2006 to 2010, which has a total of 715 firm-year observations.

Table 4.2.1: Summary of Descriptive Statistics for Manufacturing Sector

Variable	Mean	Median	Maximum	Minimum	Std Deviation
GOP	0.175	0.172	0.512	-0.083	0.081
ARD	101.080	85.000	726.000	14.000	73.548
INV	127.729	87.000	3084.000	1.000	177.874
AP	46.868	41.570	209.510	0.420	32.495
CCC	181.941	129.090	3534.120	-13.810	215.309
WCIP	0.510	0.510	0.900	0.080	0.165
WCFP	0.295	0.270	0.780	0.030	0.158
CR	2.731	1.680	24.430	0.100	2.985
SIZE	12.026	11.880	16.280	8.780	1.303
GROWTH	0.100	0.054	12.887	-0.694	0.569
DEBT	0.227	0.230	0.760	0.000	0.171
Observations	715	715	715	715	715

Based on Table 4.2.1, the average profit of the manufacturing firms as indicated by GOP is 17.5% (median 17.2%). The minimum value for GOP is reported as negative 8.3% with maximum value of 51.2%, whereby the standard deviation of GOP is indicated as 8.1%, which means that GOP value can deviate from mean of both sides by 8.1%.

For WCM components, noted that INV has reported the highest mean value of 128 days, followed by ARD with average of 101 days and AP recorded an average of 47 days, which resulted in average CCC of 182 days that is around 6 months period. These reflect that manufacturing firms receive payment from sales proceeds on average of 101 days with standard deviation of 74 days, which the minimum collection period from receivables proceeds is 14 days with maximum period of 726 days. Furthermore, firms take an average of 128 days to sell inventory with standard deviation of 178 days, which the median for inventory conversion to sales is 87 days. Meanwhile, firms pay their purchases an average of 47 days with standard deviation of 32 days, which the minimum period reported as 0.42 days and maximum period

is 209 days. Reportedly, CCC as a measure of efficiency in working capital management has an average of 182 days with median of 129 days.

In terms of WCM policy, the average value of WCIP is reported as 51% of total assets, while WCFP recorded an average of 29.5% of total assets. The average current ratio of manufacturing firms is reported as 2.73, while the mean size of the firms is 12.03. Meanwhile, the average sales growth and debt ratio are reported as 10% and 22.7% respectively.

4.2.2 Pearson's Correlation Analysis

Pearson's Correlation analysis, which is also known as bivariate correlations has been performed in order to determine and identify if there is any significant strong relationship between the independent and dependent variables such as the WCM components, WCM policy and control variables towards the profitability of firms measured by GOP under manufacturing sectors. Furthermore, based on the Pearson's correlation table, it also allows detection of any potential of multicollinearity problem (Falope and Ajilore, 2009). The detailed of the overall Pearson's correlation matrix is shown as per Appendix 7 and the summary of the Pearson's correlation matrix is presented in Table 4.2.2 below.

Table 4.2.2 : Pearson's Correlation Matrix of Manufacturing Sector

	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
GOP	1										
ARD	-0.339*** (-9.624)	1									
INV	-0.255*** (-7.032)	0.458*** (13.749)	1								
AP	0.034 (0.916)	0.230*** (6.325)	0.227*** (6.219)	1							
CCC	-0.331*** (-9.379)	0.685*** (25.106)	0.948*** (79.762)	0.115*** (3.097)	1						
WCIP	0.180*** (4.882)	0.111*** (2.979)	0.094*** (2.512)	-0.277*** (-7.707)	0.157*** (4.248)	1					
WCFP	-0.031 (-0.837)	-0.069* (-1.859)	-0.051 (-1.356)	0.085** (2.269)	-0.078** (-2.100)	0.050 (1.334)	1				
CR	-0.043 (-1.154)	0.041 (1.085)	0.035 (0.937)	-0.271*** (-7.519)	0.084** (2.244)	0.324*** (9.139)	-0.628*** (-21.562)	1			
SIZE	0.259*** (7.149)	-0.466*** (-14.052)	-0.311*** (-8.752)	-0.231*** (-6.335)	-0.382*** (-11.022)	0.075** (2.015)	0.299*** (8.381)	-0.213*** (-5.809)	1		
GROWTH	0.096*** (2.584)	-0.174*** (-4.731)	-0.077** (-2.071)	-0.020 (-0.542)	-0.120*** (-3.239)	-0.007 (-0.187)	0.066* (1.778)	-0.071** (-1.901)	0.141*** (3.792)	1	
DEBT	-0.184*** (-5.005)	-0.084** (-2.256)	-0.062* (-1.659)	-0.027 (-0.720)	-0.076** (-2.033)	-0.272*** (-7.547)	0.739*** (29.254)	-0.552*** (-17.696)	0.293*** (8.171)	0.069* (1.854)	1

Notes:
* indicates correlation is significant at the 10% level, ** indicates correlation is significant at the 5% level, *** indicates correlation is significant at the 1% level. t-statistic is reported in the parentheses.

Based on Table 4.2.2, there are high correlation values observed between CCC and ARD as the correlation is 0.685; between CCC and INV with high correlation reported as 0.948; and between DEBT and WCFP as there is a high correlation of 0.739. Thus, there is a multicollinearity problem in developing regression that includes all the independent and control variables into one liner regression as the correlation is higher than 0.7 (Pallant, 2009; Reimann, Filzmoser, Garrett and Dutter, 2008). However, this problem of multicollinearity is being mitigated by not including the variables of CCC, ARD, INV, DEBT and WCFP together in a similar regression since there are highly correlated. As highlighted earlier, one of the weaknesses of Pearson

correlation is it does not offered a consistent indication of the relationship as the association of each variable with the other independent variables has not been taken into consideration in the evaluation of the simple bivariate correlations (Akinlo, 2012).

Thus, five panel data regression models have been developed to investigate on the individual effect of WCM components (ARD, INV, AP, CCC) and WCM policy (WCIP and WCFP) in manufacturing sector, which analysis have been conducted separately towards the GOP of the firms as dependent variable.

4.2.3 Testing of Hypotheses

Based on the seven hypotheses and five panel data regression models developed earlier in Chapter 3, the hypotheses are tested by examining on the effect of WCM components such as ARD, INV, AP, CCC on profitability of the firms as illustrated as per Model 1, 2, 3 and 4; while the effect of WCM policy as indicated by WCIP and WCFP on profitability of the manufacturing firms are reflected as per Model 5 in Table 4.2.4.

4.2.4 The Effect of Working Capital Management (WCM) components on Profitability of firms in Manufacturing sector

The results of the effect of WCM components on profitability of firms in manufacturing sector are reflected as per Eview output as per Appendix 8, while the panel data regression analysis is summarized as per Table 4.2.4.

Table 4.2.4: Panel Data Regression Analysis of Manufacturing Sector

Dependent Variable : Gross Operating Profit (GOP)					
Regression Method : Panel Least Squares (Fixed Effects Estimation)					
Period : 2006 to 2010					
Model	**1**	**2**	**3**	**4**	**5**
C	-0.608*** (-6.882)	-0.683*** (-6.583)	-0.711*** (-6.075)	-0.658*** (-6.260)	-0.709*** (-10.764)
ARD	-5.85E-05* (-1.887)				
INV		1.21E-05 (0.588)			
AP			0.0002 (1.207)		
CCC				-3.72E-06 (-0.206)	
WCIP					0.177*** (5.368)
WCFP					-0.123*** (-3.639)
CR	-0.003*** (-5.049)	-0.003*** (-4.534)	-0.002*** (-4.770)	-0.003*** (-4.656)	-0.005*** (-4.165)
SIZE	0.071*** (9.311)	0.077*** (8.544)	0.078*** (8.332)	0.075*** (8.248)	0.070*** (15.370)
GROWTH	-4.52E-05 (-0.009)	0.0005 (0.087)	0.0005 (0.093)	0.0003 (0.050)	-0.0005 (-0.074)
DEBT	-0.250*** (-9.308)	-0.252*** (-9.286)	-0.246*** (-10.228)	-0.250*** (-9.135)	
R-squared	0.753	0.753	0.754	0.753	0.743
Adjusted R-squared	0.689	0.689	0.691	0.689	0.676
F-statistic	11.780***	11.751***	11.838***	11.742***	11.134***
Hausman Test (Chi-Sq. Statistic)	47.897***	59.022***	53.464***	56.879***	51.063***

Note :
Results obtained using fixed effects method estimation and t-statistic is shown in parentheses under the coefficients with symbol * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

Based on Model 1 in Table 4.2.4, there is a significant negative relationship between ARD and GOP at significance level of 0.1. This result revealed that an increase in the number of days accounts receivable (ARD) by a day has reduced the GOP of the firms by -0.006%, which the result is consistent with the majority of the findings from past literature review conducted that had also

revealed a significant negative relationship between profitability and ARD (Deloof, 2003; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Gill, Biger and Mathur, 2010; Dong and Su, 2010).

Based on the hypotheses developed to examine on the effect of ARD on GOP:-

$H1_o$: There is no significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

$H1_a$: There is a significant relationship between Number of days Accounts Receivable (ARD) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 1 above, the null hypothesis of $H1_o$ is rejected. Therefore, there is a significant negative relationship between ARD and GOP of firms under manufacturing sector, which is consistent with the results obtained by previous researchers.

Based on Model 2 in Table 4.2.4 that analyze on the effect of INV towards the firms' GOP, it is revealed that INV has a positive relationship with GOP, but the relationship is not significant. This indicates that an increase of the number of days inventories (INV) by a day has increases the GOP of the firms by 0.001%, but the result is not significant. The result obtained is found to be contrary with previous literature review, which mostly revealed a negative relationship (Deloof, 2003; Falope and Ajilore, 2009; Dong and Su, 2010). However, the result found is consistent with the study conducted by Capkun, Hameri and Weiss (2009), which revealed a significant positive relationship between inventory performance measured by both total inventory and its

components, which refer to raw material, work-in-process and finished goods; and financial performance of firms in manufacturing sector that is measured by gross profit and earnings before interests and taxes (EBIT).

Based on the hypotheses developed to examine on the effect of INV on GOP:-

$H2_o$: There is no significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

$H2_a$: There is a significant relationship between Number of days Inventories (INV) and Gross Operating Profit (GOP) of the firms.

Therefore, based on the result obtained in Model 2 above, the null hypothesis of $H2_o$ is accepted in view that the positive relation between INV and GOP of the firms in manufacturing sector is not significant during the period of 2006 to 2010. In Malaysia, one of the reasons an increase in INV will increase the firm's profitability is due to the effect of inflation rates in Malaysia which has been on increasing trend from 0.6% in year 2009 to 1.7% in 2010 (Economic Report). Hence, firms need to keep a high number of stocks which comprise of raw materials and finished goods, in anticipation of the price increase that will affect their bottom line and also in order to be competitive in the industry.

In Model 3 of Table 4.2.4, AP reported an insignificant positive relationship with GOP, which implies that GOP has increased by 0.02% by lengthening a day of the accounts payable (AP). Although the result obtained contradicts with some of the earlier studies that revealed a negative relation between AP

and profitability (Deloof, 2003; Falope and Ajilore, 2009), however, the result is supported by study conducted by Dong and Su (2010), who had found a significant positive association between AP and profitability, which means that there is a delay in payment by firms with higher profitability. Furthermore, the increase in AP may increase the firm's profitability partly due to well established firms are given longer trade credit terms by their suppliers due to their long business relationship and most of their purchases are in bulk orders.

Based on the hypotheses developed to examine on the effect of AP on GOP:-

$H3_o$: There is no significant relationship between Number of days Accounts Payable (AP) and Gross Operating Profit (GOP) of the firms.

$H3_a$: There is a significant relationship between Number of days Accounts Payable (AP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 3 above, the null hypothesis of $H3_o$ is accepted due to despite that there is a positive relationship, however, the relationship is not significant between AP and GOP of the firms under manufacturing sector.

Based on Model 4 in Table 4.2.4, CCC reported a negative relationship with GOP, which indicates that there is a decrease in GOP by 0.0004% by lengthening the cash conversion cycle (CCC). However, the relationship is found as not significant, which the findings obtained is consistent with the results derived by Deloof (2003) and Akinlo (2012), who had found an insignificant negative relationship between CCC and profitability under fixed

effects estimation model, in view that profitability decreases as a result of an increase in the number of days accounts receivable, inventories as well as number of days accounts payable (AP) that have negative relationship with profitability; and AP had been deducted in computation of CCC.

Based on the hypotheses developed to examine on the effect of CCC on GOP:-

$H4_o$: There is no significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

$H4_a$: There is a significant relationship between Cash Conversion Cycle (CCC) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 4 above, the null hypothesis of $H4_o$ is accepted as there is no significant relationship observed between CCC and GOP of the manufacturing firms during the period of 2006 to 2010.

Overall, based on the results derived from Model 1 to Model 4 in Table 4.2.4, it is suggested that the firm's finance manager can increase the profitability of the firm in manufacturing sector by reducing the ARD, that represent part of the WCM components that reveals a significant negative relationship with profitability of the firms, which is measured by GOP.

4.2.5 The Effect of Working Capital Management (WCM) policies on Profitability of Firms in Manufacturing Sector

Based on Model 5 in Table 4.2.4, the working capital investment policy (WCIP) of the firms in manufacturing sector reveals a statistically strong positive relationship with GOP at 0.01 significance level.

Based on the hypotheses developed to examine on the effect of WCIP on GOP of firms:-

$H5_o$: There is no significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

$H5_a$: There is a significant relationship between working capital investment policy (WCIP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the results reflected in Model 5 in Table 4.2.4, the null hypothesis of $H5_o$ is rejected, in view that there is a significant positive relationship found between WCIP and GOP of firms in manufacturing sector during period of 2006 to 2010, which also reflects that profitability can be increased by adopting a conservative WCIP policy. The positive coefficient of WCIP ratio also denotes a negative association between the degree of aggressiveness of investment policy and profitability. This means that when WCIP as reflected by total current assets to total assets ratio increases, there is a decrease in the degree of aggressiveness, which resulted in an increase of GOP of the firms. The result obtained is similar to the finding derived by Nazir and Afza (2009), who found that there is a negative relationship

between the degree of aggressiveness of working capital management policies and profitability measurement.

However, on the other hand, the firms' working capital financing policy as represented by WCFP reflects a statistically significant negative relationship with GOP, which indicates that there is a drop in GOP by 12.3% by adopting an aggressive WCFP. The negative coefficient of WCFP also indicates the negative relation between the degree of aggressiveness of working capital financing policy (WCFP) and profitability of firms that is measured by gross operating profit (GOP). This means that the higher the WCFP ratio as reflected by total current liabilities to total assets ratio, the more aggressive the WCFP that resulted in lower GOP for the firms. The result obtained is consistent to the finding derived by Nazir and Afza (2009).

Based on the hypotheses developed to examine on the effect of WCFP on GOP of firms:-

$H6_o$: There is no significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

$H6_a$: There is a significant relationship between the working capital financing policy (WCFP) and Gross Operating Profit (GOP) of the firms.

Thus, based on the result obtained in Model 5 in Table 4.2.4, the null hypothesis of $H6_o$ is rejected. Therefore, the manufacturing firms adopting an aggressive WCFP resulted in a decrease in GOP for firms in manufacturing

sector during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan (IMP3) from the period of 2006 to 2010.

4.2.6 The Effect of Control variables on Profitability of Firms

There are four control variables used in the analysis of panel data regression models, which are CR, SIZE, GROWTH and DEBT. Overall, current ratio (CR) showed a significant negative relationship with GOP at 0.01 level of significant in all the panel data regression models in Table 4.2.4, which indicates that an increase in the current ratio as a proxy for liquidity level of the firms resulted in reduction of firms' profitability. The result obtained is consistent with the study on trade-off between liquidity and profitability as highlighted by Eljelly (2004); Charitou, Lois and Halim (2012).

Meanwhile, other control variable such as SIZE of the firms has reported a statistically high significant positive relationship with GOP at 0.01 significant levels in all the panel data regression models from Model 1 to Model 5, which the results are consistent with other previous studies conducted by Deloof (2003); Lazaridis and Tryfonidis, 2006; Raheman, Afza, Qayyum and Bodla (2010); Akinlo (2012); Charitou, Lois and Halim (2012). This indicates that the larger the size of the firms, the higher the profitability achieved as the firms are able to reap the benefit of economies of scales and obtain easier funding to expand the business.

The sales growth (GROWTH) of the firms under manufacturing sector reported a positive relationship with GOP in Model 2, 3 and 4 of the panel

data regression models, but it is not a significant relationship. Meanwhile, an insignificant negative relationship between sales growth and GOP reported in Model 1 and Model 5, which the findings contradict with the previous literature review that found a positive association between GROWTH and profitability of firms (Akinlo, 2012; Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009; Raheman, Afza, Qayyum and Bodla, 2010).

The manufacturing firms had reported a strong inverse relationship between DEBT and GOP with high significance level at 0.01 in all the panel data regression models, which the results derived are consistent with other previous literature reviews (Charitou, Lois and Halim, 2012; Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009). Thus, the significant negative relationship indicates that an increase in debt level raises the interest expense and the possibility of firms defaulting, which profitability is negatively affected.

4.2.7 Overall Regression Analysis

Overall, the firms under manufacturing sector reported R-squared (R^2) that ranges between 74.3% and 75.4% as reflected in the five panel data regression models, which indicate that the variation of the GOP has been explained by the independent variables between 74.3% and 75.4% in the respective regression models.

Meanwhile, there is a statistically high significant level of F-Statistic that varies between 11.134 to 11.838 at 0.01 significant level. This means that the overall variations in GOP of the firms are explained between 11.13% and 11.84% of the independent variables in the respective regression models.

Panel data models are estimated upon determining the correlation between unobservable heterogeneity η_i of each firm and the explanatory variables, which the fixed or random effects selection is by applying Hausman (1978) test under null hypothesis $E(\eta_i/X_{i,t}) = 0$ (Falope and Ajilore, 2009). Thus, fixed effects method is selected as compared to the random effects estimation in view that based on Hausman test result, as reflected by the Chi-Square statistic revealed mostly significant at 0.01 levels in all the models. This means that null hypothesis $E(\eta_i/X_{i,t}) = 0$ is rejected. Thus, fixed effects model estimation on panel least square method is selected for the regression.

4.3   Comparison of Profitability between Services and Manufacturing sector

The T-test result for equality of means profitability between services and manufacturing sector is presented under Appendix 9 and summarized per Table 4.3 below.

Table 4.3:   Summary of T-test result of Equality of Means Profitability between Services and Manufacturing sector

Variable	Observations	Mean	T-test for Equality of Means	Conclusion
GOP Services	375	0.213		Reject null hypothesis, H7$_0$. Significant difference in mean profitability between services and manufacturing sector
GOP Manufacturing	715	0.175	4.783***	
Total	**1,090**	**0.188**		

Based on Table 4.3, it can be concluded that there is a significant difference in terms of mean of profitability achieved by services sector and manufacturing sector, as evidenced by the highly significant difference observed in the t-test for equality of means.

Based on the hypotheses developed to examine on the difference between the mean profitability of services sector and manufacturing sector:-

$H7_0$: There is no significant difference between the mean profitability of services sector and manufacturing sector.

$H7_a$: There is a significant difference between the mean profitability of services sector and manufacturing sector.

Hence, based on result in Table 4.3, the null hypothesis of $H7_0$ is rejected, which indicates that there is a significant difference between the mean profitability of services sector and manufacturing sector during the implementation of the Ninth Malaysia Plan (9MP) and Third Industrial Master Plan (IMP3) from period of 2006 to 2010. Furthermore, services sector reported higher mean value for GOP of 21.3% as compared to mean of GOP for manufacturing sector of 17.5%.

Thus, this also reflects on the effectiveness of the implementation of the 9MP and IMP3 policy in promoting services sector and manufacturing sector, which the result obtained is also in tandem with the Malaysia's GDP indicators that revealed a higher share of GDP contribution for services sector of 57.7% as compared to manufacturing sector share of GDP of 27.6% in 2010.

4.4 Comparison of the Effect of WCM components on Profitability of firms between Services and Manufacturing sector

Based on the results derived from the panel data regression analysis of services and manufacturing sector respectively in Table 4.1.4 and Table 4.2.4, the results are summarized as per Table 4.4 below for comparison.

Table 4.4: Comparison of the Effect of WCM components on Profitability of firms between Services and Manufacturing sector

Variable	Services			Manufacturing		
	Expected Sign	Result Sign	Final Result (t-statistic)	Expected Sign	Result Sign	Final Result (t-statistic)
ARD	-	-	Reject $H1_0$. Significant relationship	-	-	Reject $H1_0$. Significant relationship
INV	+/-	+	Reject $H2_0$. Significant relationship	+/-	+	Accept $H2_0$. No significant relationship
AP	+/-	+	Accept $H3_0$. No significant relationship	+/-	+	Accept $H3_0$. No significant relationship
CCC	+/-	-	Reject $H4_0$. Significant relationship	+/-	-	Accept $H4_0$ No significant relationship

Overall, based on Table 4.4, the profitability of the services sector firms can be improved by reducing the ARD, CCC and increasing the INV level, which results reveal that ARD, CCC and INV that represent the WCM components have a significant relationship with profitability of the firms. However, AP does not have a significant relation with GOP, despite reported a positive relationship.

Meanwhile, for manufacturing firms, it is suggested that the profitability of the firm can be increased by reducing the ARD, which result reveals a significant negative relationship found between ARD and profitability of the firms. The rest of the WCM components such as INV, AP and CCC do not have significant relationship with the GOP of the firms.

Noted also that the result signs derived from the services and manufacturing sectors for each of the WCM components have similar relationship, although there are different in terms of the significance level. This indicates that there is a similar pattern of relationship observed among the WCM components regardless of the economic sector.

4.5   Comparison of the Effect of WCM policies on Profitability of firms between Services and Manufacturing sector

The comparison of the effect of WCM policies adopted between services and manufacturing firms are summarized as per Table 4.5.

Table 4.5: Comparison of the Effect of WCM policies on Profitability of firms between Services and Manufacturing sector

Variable	Services			Manufacturing		
	Result Sign	Final Result (t-statistic)	Conclusion	Result Sign	Final Result (t-statistic)	Conclusion
WCIP	-	Significant relationship	Aggressive	+	Significant relationship	Conservative
WCFP	-	No significant relationship	Aggressive	-	Significant relationship	Aggressive

Based on Table 4.5, in view that there is a significant negative relationship reported between WCIP and GOP, it is concluded that the firms in services sector has been adopting an aggressive WCIP, which had resulted in an increase in profitability of the firms. Meanwhile, there is no significant relationship found between WCFP and profitability of firms in the services sector.

For the manufacturing firms, there is a significant positive relationship reported between WCIP and GOP during the period of 2006 to 2010, which also reflects that profitability can be increased by adopting a conservative WCIP policy. Meanwhile, there is a significant negative relationship found between WCFP and GOP of the firms, which indicates that there is a decrease in GOP of the firms by adopting an aggressive WCFP.

CHAPTER 5 : CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter concludes the findings that had been derived based on panel data regression analysis and hypotheses developed, in accordance to the research questions and research objectives. Limitations of the study are also discussed together with the recommendations that need to be taken into considerations for future study by interested researchers.

5.1 Summary of Panel Data Regression Analysis of Services Sector

Based on the research questions and research objectives developed, the summary of the panel data regression analysis is presented as per Table 5.1 for services sector.

Table 5.1: Summary of Panel Data Regression Analysis of Services sector

Variables	Null Hypothesis	Expected Sign	Result Sign	Final Result (t-statistic)	Conclusion
ARD	No significant relationship	-	-	Significant relationship	Alternative hypothesis of $H1_a$ is supported
INV	No significant relationship	+/-	+	Significant relationship	Alternative hypothesis of $H2_a$ is supported
AP	No significant relationship	+/-	+	No significant relationship	Null hypothesis of $H3_0$ is supported
CCC	No significant relationship	+/-	-	Significant relationship	Alternative hypothesis of $H4_a$ is supported
WCIP	No significant relationship	+/-	-	Significant relationship	Alternative hypothesis of $H5_a$ is supported
WCFP	No significant relationship	+/-	-	No significant relationship	Null hypothesis of $H6_0$ is supported

CR	No significant relationship	-	-	Significant negative relationship in all the models at 0.01 level of significance
SIZE	No significant relationship	+/-	+	Significant positive relationship in all the models at 0.01 level of significance
GROWTH	No significant relationship	+	+	Significant positive relationship at 0.1 level of significant in Model 2, 0.05 level of significant in Model 3 and 4, and 0.01 level of significant in Model 3
DEBT	No significant relationship	-	-	Significant negative relationship found in Model 2 to 5 at 0.01 level of significance, and significant level of 0.05 in Model 1

Overall, based on Table 5.1, the profitability of the firms in services sector can be improved by reducing the number of days Accounts Receivable (ARD) and cash conversion cycle (CCC); while increasing the number of days Inventories (INV) level, which ARD, CCC and INV that represent the WCM components have a significant relationship with profitability of the firms. However, number of days Accounts Payable (AP) does not have a significant relationship with Gross Operating Profit (GOP), despite reported a positive relationship. Meanwhile, control variable such as current ratio (CR) and debt ratio (DEBT) reveals a significant negative relationship with profitability, while firm size (SIZE) and sales growth (GROWTH) reflect a significant positive relationship with GOP of the services firms.

For services sector, in view that there is a significant negative relationship reported between working capital investment policy (WCIP) and gross operating profit (GOP) of the firms, it is concluded that the firms in services sector has been adopting an aggressive WCIP, which had resulted in an increase in profitability of the firms. Meanwhile, there is no significant

relationship found between WCFP and profitability of firms in the services sector.

5.2 Summary of Panel Data Regression Analysis of Manufacturing Sector

The summary of the panel data regression analysis is presented as per Table 5.2 for manufacturing sector.

Table 5.2: Summary of Panel Data Regression Analysis of Manufacturing Sector

Variables	Null Hypothesis	Expected Sign	Result Sign	Final Result (t-statistic)	Conclusion
ARD	No significant relationship	-	-	Significant relationship	Alternative hypothesis of $H1_a$ is supported
INV	No significant relationship	+/-	+	No significant relationship	Null hypothesis of $H2_0$ is supported
AP	No significant relationship	+/-	+	No significant relationship	Null hypothesis of $H3_0$ is supported
CCC	No significant relationship	+/-	-	No significant relationship	Null hypothesis of $H4_0$ is supported
WCIP	No significant relationship	+/-	+	Significant relationship	Alternative hypothesis of $H5_a$ is supported
WCFP	No significant relationship	+/-	-	Significant relationship	Alternative hypothesis of $H6_a$ is supported
CR	No significant relationship	-	-	Significant negative relationship in all the models at 0.01 level of significance	
SIZE	No significant relationship	+/-	+	Significant positive relationship in all the models at 0.01 level of significance	
GROWTH	No significant relationship	+	+/-	Positive relationship in Models 2, 3 and 4, but negative relationship found in Model 1 and 5. However, all the relationship are not significant	
DEBT	No significant relationship	-	-	Significant negative relationship in Model 1 to Model 4 at 0.01 level of significance	

For manufacturing firms, it is suggested that the profitability of the firms can be improved by reducing the number of days Accounts Receivable (ARD), which reveals a significant negative relationship with profitability of the firms. The rest of the WCM components such as number of days Inventories (INV), number of days Accounts Payable (AP) and cash conversion cycle (CCC) do not have significant relationship with the Gross Operating Profit (GOP) of the firms. Meanwhile, control variable such as CR and DEBT reveals a significant negative relationship with profitability, while firms' SIZE reflects a significant positive relationship with GOP in the manufacturing firms. However, the sales growth, GROWTH of the firms revealed a mixture of result between positive relationship with GOP in Model 2, 3 and 4; but a negative relationship with GOP in Model 1 and 5. However, the firms' GROWTH does not have a significant relationship with GOP in all the models.

There is a significant positive relationship reported between WCIP and GOP during the period of 2006 to 2010, which also reflects that profitability can be increased by adopting a conservative WCIP policy. Meanwhile, there is a significant negative relationship found between WCFP and GOP of the firms, which indicates that there is a decrease in GOP of the firms by adopting an aggressive WCFP.

In conclusion, both firms in services and manufacturing sectors indicate that the profitability of the firms can be enhanced by reducing the number of days Accounts Receivable (ARD). Hence, the finance managers need to prioritize in managing its accounts receivable collection regularly by monitoring the firms' trade debtors ageing listing promptly. For services sector, besides ARD,

the finance manager also need to manage its number of days Inventories (INV) and cash conversion cycle (CCC) as to maintain the firm's profitability.

In this study, separate analysis has been conducted on the services and manufacturing sector, rather than combining both the sectors into one panel data regression analysis in order for us to investigate on the effect of working capital management components and working capital management policy towards the profitability of firms in services and manufacturing sector individually.

5.3 Summary of the differences in Profitability between Services and Manufacturing sector

Based on the third research objective in chapter 1 on investigation whether there is any significant difference in terms of profitability between firms in services and manufacturing sector during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan from period of 2006 to 2010, the results are summarized as per Table 5.3.

Table 5.3: Summary of the differences in Profitability between Services and Manufacturing sector

Variable	Null Hypothesis	Mean	T-test for Equality of Means	Conclusion
GOP Services	No significant relationship	0.213		Reject null hypothesis, $H7_0$. There is a significant difference in mean profitability between firms in services and manufacturing sector
GOP Manufacturing	No significant relationship	0.175	4.783***	
Total		**0.188**		

Based on Table 5.3, it can be concluded that there is a significant difference in terms of mean of profitability achieved by firms in services sector and manufacturing sector, as evidenced by the highly significant difference observed in the t-test for equality of means of 4.783 at 0.01 significance level. The result is further supported by higher share of GDP of 57.7% for services sector as compared to 27.6% share of GDP contributed by manufacturing sector in year 2010.

5.4   Limitations of the Study

Based on the study carried out in analyzing on the effect of working capital management (WCM) on profitability of firms in services and manufacturing sector, there are few limitations observed. One of the limitations is the study period covers only five years, from year 2006 to 2010, which is deemed as short duration and hence, unable to ascertain the effectiveness of the WCM components and WCM policy adopted towards the profitability of firms in the services sector and manufacturing sector that are represented by trading/services and industrial products sector respectively during the implementation of the Ninth Malaysia Plan and Third Industrial Master Plan.

Another limitation observed is the scope of study should be broadened to include all economic sectors, instead of limiting it to services and manufacturing sectors, in order to have overall view on the effect of WCM on profitability of firms in various sectors in Malaysia. Further analysis on the trading/services and industrial product sectors can be enhanced further by

analyzing on the composition of the respective sectors which had contributed towards the firm's profitability.

Besides that, profitability measurement such as GOP ratio is calculated based on book value and there is no measurement of profitability conducted using current market value. Thus, it does not reflect the current market situation of the firms in the respective sector for comparison.

Based on the study conducted, there is no external or macroeconomic factor being taken into consideration such as growth rate of Gross Domestic Product (GDP) in the regression analysis to investigate on the effect of external or macroeconomic factor towards the profitability of firms. Furthermore, noted also that the service sector in this study is represented by trading/services firms. Hence, the analysis on the effect of working capital management on profitability of firms in services sector does not represent specifically on the services sector in view that the trading firms are also formed as part of the service sector in this study.

5.5   Recommendations for Future Research

Based on the limitations identified, future research should focus and consider the following recommendations:-

i)   The study period can be lengthened by more than five years period in order for comprehensive analysis and comparison on the effect of working capital management components and working capital

management policy towards profitability of firms in the services and manufacturing sector.

ii)   Future researchers may also be interested to expand their horizon of study by examining on the effectiveness of the working capital management (WCM) policy in various economic sectors in Malaysia and may expand the analysis further to other developing or Asean countries for comparison on respective working capital management (WCM) policy.

iii)   Profitability measurements can be enhanced to include other accounting profitability such as Return on Assets and Return on Equity in the analysis; and can be expanded further to include Tobin's Q in the analysis.

iv)   Further study may segregates the firms into various firm's size in order to determine on the effect of firm's size towards the firm's profitability.

v)   The analysis of the study can be enhanced further by including dynamic model in the analysis.

vi)   The interested researchers in this study may take into consideration the macroeconomic factor such as growth rate of Gross Domestic Product (GDP) to be included in the regression analysis in order to analyse on the effect of macroeconomic factor towards the profitability of the firms.

vii)   Future research should also separate the trading/services firms, which was earlier categorised under services sector by analysing purely on the firms in services sector specifically instead of combining the firms in

services with the trading firms in order to investigate on the effect of working capital management on profitability of firms in services sector.

5.6   Implications of the Study

One of the implications of the study is that it allows finance managers, management level, practitioner, policy maker and academician to broaden their knowledge and learning curve on the importance of managing their working capital efficiently due to its impact towards the firm's profitability.

Furthermore, by conducting this study, it enables firm minimizing on its cost of finance and conducts more prudent planning on the working capital management components such as accounts receivable, inventory and accounts payable in order to maximize the firm's profitability and further enhancement of the shareholders' wealth. The firm manager may also be able to determine on the appropriateness of the working capital management policy selected for their organization and take necessary actions to maximize on the profitability and shareholders' wealth of the firms.

In addition, based on the results of this study on the effect of working capital management components and working capital management policy, it assists the finance managers in making important decision to achieve optimal working capital structure for the firms that allows maximization of profit and shareholders' wealth.

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APPENDICES

Appendix 1 : List of firms under Trading/Services (Services) Sector

No.	Company Name	No.	Company Name
1	AHB HOLDINGS BHD	41	MALAYSIAN AIRLINE
2	AIRASIA BERHAD	42	MBM RESOURCES BERHAD
3	ANALABS RESOURCES	43	MEDIA CHINESE INTL.(KLS)
4	ATIS CORPORATION BHD	44	MEGA FIRST CORP
5	AWC BERHAD	45	METRONIC GLOBAL BHD
6	AXIATA GROUP	46	MISC BHD
7	BERJAYA CORP	47	MULPHA INTERNATIONAL
8	BERJAYA LAND BHD	48	PERDANA PETROLEUM
9	BERJAYA SPORTS TOTO	49	PHARMANIAGA BERHAD
10	BHS INDUSTRIES	50	PJBUMI BHD
11	BINTAI KINDEN CORP	51	PJI HOLDINGS BHD
12	BORNEO OIL BHD	52	PULAI SPRINGS BHD
13	CME GROUP BERHAD	53	RELIANCE PACIFIC BHD
14	CNI HOLDINGS BERHAD	54	RGB INTERNATIONAL
15	DESTINI	55	SAAG CONSOLIDATED
16	DIALOG GROUP BERHAD	56	SALCON BERHAD
17	DKSH HDG.(MALAYSIA)	57	SEE HUP CONSOLIDATED
18	ECOFIRST CONSO BHD	58	SUIWAH CORP BHD
19	EDEN INC. BERHAD	59	SURIA CAPITAL HLDGS
20	EFFICIENT E-SOL BHD	60	SYMPHONY HOUSE BHD
21	ESTHETICS INTL.GROUP	61	TALIWORKS CORP
22	FABER GROUP BERHAD	62	TANJUNG OFFSHORE BHD
23	FIAMMA HOLDINGS BHD	63	TELEKOM MALAYSIA BHD
24	FITTERS DIVERSIFIED	64	TENAGA NASIONAL BHD
25	GENTING BERHAD	65	THE STORE
26	GOLSTA SYNERGY BHD	66	TIME ENGINEERING BHD
27	GUNUNG CAPITAL BHD	67	TIONG NAM LOG HLDGS
28	HAI-O ENTERPRISE BHD	68	TRADEWINDS CORP BHD
29	HAISAN RESOURCES BHD	69	TRIUMPHAL ASSOCIATES
30	HAP SENG CONSOLIDATED	70	TURIYA BHD
31	HARBOUR-LINK GROUP	71	UMS HOLDINGS BERHAD
32	HEXAGON HOLDINGS	72	UNIMECH GROUP BHD
33	HUBLINE BHD	73	UTUSAN MELAYU (MALAYSIA)
34	IPMUDA BERHAD	74	WARISAN TC HOLDINGS
35	KAMDAR GROUP (M) BHD	75	WIDETECH (MALAYSIA)
36	KBES BERHAD		
37	KFC HOLDINGS (MALAYSIA)		
38	KNUSFORD BHD		
39	KUMPULAN FIMA BERHAD		
40	MALAYSIA AIRPORTS HDG.		

Appendix 2 : Descriptive Statistics of Services Sector

Date:12/04/12
Time: 18:55
Sample: 2006 2010

	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
Mean	0.212669	158.8587	106.8187	85.01093	180.6664	0.472933	0.303600	2.105253	12.69072	0.154586	0.245600
Median	0.164900	111.0000	48.00000	61.46000	119.9300	0.450000	0.260000	1.570000	12.50000	0.074100	0.240000
Maximum	1.024100	1885.000	1628.000	536.3300	2876.280	0.950000	0.940000	12.75000	17.23000	17.83730	0.770000
Minimum	-0.062500	4.000000	1.000000	2.780000	-436.3300	0.100000	0.030000	0.180000	9.170000	-0.804700	0.000000
Std. Dev.	0.178775	181.3617	180.2620	86.02742	276.1343	0.208834	0.184271	1.638964	1.741171	0.989314	0.164657
Skewness	2.331987	4.158719	4.563644	2.850006	4.768116	0.355254	0.955162	2.509140	0.489381	15.38156	0.566271
Kurtosis	9.387679	29.20088	30.79119	12.78783	36.47349	2.176120	3.362840	11.45851	2.788911	273.8801	3.014173
Jarque-Bera	977.4234	11807.28	13369.65	2004.558	18928.34	18.49374	59.07793	1511.400	15.66460	1161288.	20.04455
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000096	0.000000	0.000000	0.000397	0.000000	0.000044
Sum	79.75090	59572.00	40057.00	31879.10	67749.90	177.3500	113.8500	789.4700	4759.020	57.96990	92.10000
Sum Sq. Dev.	11.95318	12301640	12152904	2767868.	28517561	16.31077	12.69944	1004.639	1133.847	366.0493	10.13984
Observations	375	375	375	375	375	375	375	375	375	375	375

Appendix 3 :   Pearson's Correlation Matrix of Services Sector

Covariance Analysis: Ordinary
Date: 12/04/12   Time: 19:35
Sample: 2006 2010
Included observations: 375

Correlation t-Statistic Probability	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
GOP	1.000000										

ARD	-0.317197	1.000000									
	-6.459680	-----									
	0.0000	-----									
INV	-0.124336	0.304401	1.000000								
	-2.420101	6.171847	-----								
	0.0160	0.0000	-----								
AP	-0.140180	0.464009	0.063239	1.000000							
	-2.734325	10.11649	1.223797	-----							
	0.0065	0.0000	0.2218	-----							
CCC	-0.245827	0.710944	0.833031	0.034496	1.000000						
	-4.898001	19.52457	29.08120	0.666631	-----						
	0.0000	0.0000	0.0000	0.5054	-----						
WCIP	0.062249	0.230428	-0.082341	0.077886	0.073325	1.000000					
	1.204573	4.573371	-1.595683	1.508809	1.419963	-----					
	0.2291	0.0000	0.1114	0.1322	0.1565	-----					
WCFP	-0.092068	0.300564	-0.043199	0.341835	0.062711	0.473041	1.000000				
	-1.785719	6.086282	-0.835086	7.025114	1.213537	10.36949	-----				
	0.0750	0.0000	0.4042	0.0000	0.2257	0.0000	-----				
CR	0.092114	-0.091243	-0.029964	-0.254774	-0.000115	0.217679	-0.551054	1.000000			
	1.786606	-1.769582	-0.578966	-5.088425	-0.002230	4.307374	-12.75377	-----			
	0.0748	0.0776	0.5630	0.0000	0.9982	0.0000	0.0000	-----			

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SIZE	0.079437	-0.391395	-0.236696	-0.204418	-0.347895	-0.198021	-0.083929	-0.183923	1.000000		
	1.539046	-8.214410	-4.705053	-4.033135	-7.166641	-3.901691	-1.626672	-3.613789	-----		
	0.1246	0.0000	0.0000	0.0001	0.0000	0.0001	0.1047	0.0003	-----		
GROWTH	0.008766	-0.131304	-0.090184	-0.045640	-0.130892	0.016601	0.059965	-0.047355	0.056329	1.000000	
	0.169301	-2.558039	-1.748866	-0.882382	-2.549886	0.320662	1.160204	-0.915603	1.089630	-----	
	0.8657	0.0109	0.0811	0.3781	0.0112	0.7486	0.2467	0.3605	0.2766	-----	
DEBT	-0.266817	0.157986	0.018609	0.029365	0.106764	-0.243505	0.281708	-0.423350	0.159498	-0.049947	1.000000
	-5.346936	3.090025	0.359471	0.567368	2.073799	-4.848814	5.670337	-9.024886	3.120373	-0.965849	-----
	0.0000	0.0022	0.7194	0.5708	0.0388	0.0000	0.0000	0.0000	0.0019	0.3347	-----

Appendix 4 : Eview Output for Services Sector

Model 1

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:17
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.149203	0.051711	-2.885329	0.0042
ARD	-0.000103	2.21E-05	-4.664708	0.0000
CR	-0.014827	0.002983	-4.971378	0.0000
SIZE	0.033564	0.003556	9.438986	0.0000
GROWTH	0.001854	0.001270	1.459765	0.1454
DEBT	-0.068287	0.034602	-1.973476	0.0494

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.938234	Mean dependent var		0.212669
Adjusted R-squared	0.921693	S.D. dependent var		0.178775
S.E. of regression	0.050027	Akaike info criterion		-2.965780
Sum squared resid	0.738306	Schwarz criterion		-2.128036
Log likelihood	636.0837	Hannan-Quinn criter.		-2.633191
F-statistic	56.72221	Durbin-Watson stat		1.709355
Prob(F-statistic)	0.000000			

Hausman's 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	17.757680	5	0.0033

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ARD	-0.000103	-0.000121	0.000000	0.0074
CR	-0.014827	-0.014133	0.000000	0.2295
SIZE	0.033564	0.019318	0.000039	0.0233
GROWTH	0.001854	0.003428	0.000001	0.1016
DEBT	-0.068287	-0.093252	0.000138	0.0335

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:20
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.149203	0.124953	-1.194074	0.2334
ARD	-0.000103	2.59E-05	-3.984201	0.0001
CR	-0.014827	0.002967	-4.997012	0.0000
SIZE	0.033564	0.009687	3.464893	0.0006
GROWTH	0.001854	0.003267	0.567347	0.5709
DEBT	-0.068287	0.040666	-1.679216	0.0942

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.938234	Mean dependent var	0.212669
Adjusted R-squared	0.921693	S.D. dependent var	0.178775
S.E. of regression	0.050027	Akaike info criterion	-2.965780
Sum squared resid	0.738306	Schwarz criterion	-2.128036
Log likelihood	636.0837	Hannan-Quinn criter.	-2.633191
F-statistic	56.72221	Durbin-Watson stat	1.709355
Prob(F-statistic)	0.000000		

Model 2

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:23
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.470603	0.065450	-7.190250	0.0000
INV	6.88E-05	2.38E-05	2.886549	0.0042
CR	-0.014305	0.003171	-4.511763	0.0000
SIZE	0.057932	0.005174	11.19781	0.0000
GROWTH	0.000808	0.000442	1.829674	0.0683
DEBT	-0.119271	0.037819	-3.153764	0.0018

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935914	Mean dependent var	0.212669
Adjusted R-squared	0.918751	S.D. dependent var	0.178775
S.E. of regression	0.050958	Akaike info criterion	-2.928907
Sum squared resid	0.766037	Schwarz criterion	-2.091162
Log likelihood	629.1700	Hannan-Quinn criter.	-2.596318
F-statistic	54.53359	Durbin-Watson stat	1.637111
Prob(F-statistic)	0.000000		

Hausman's 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	21.092143	5	0.0008

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
INV	0.000069	0.000037	0.000000	0.0021
CR	-0.014305	-0.013786	0.000000	0.3688
SIZE	0.057932	0.035937	0.000042	0.0007
GROWTH	0.000808	0.003776	0.000001	0.0037
DEBT	-0.119271	-0.142729	0.000137	0.0453

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:26
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.470603	0.128174	-3.671587	0.0003
INV	6.88E-05	3.20E-05	2.149357	0.0324
CR	-0.014305	0.003023	-4.731750	0.0000
SIZE	0.057932	0.009937	5.829746	0.0000
GROWTH	0.000808	0.003345	0.241531	0.8093
DEBT	-0.119271	0.040857	-2.919235	0.0038

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935914	Mean dependent var	0.212669
Adjusted R-squared	0.918751	S.D. dependent var	0.178775
S.E. of regression	0.050958	Akaike info criterion	-2.928907
Sum squared resid	0.766037	Schwarz criterion	-2.091162
Log likelihood	629.1700	Hannan-Quinn criter.	-2.596318
F-statistic	54.53359	Durbin-Watson stat	1.637111
Prob(F-statistic)	0.000000		

Model 3

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:29
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.400967	0.087355	-4.590077	0.0000
AP	7.78E-05	8.48E-05	0.916835	0.3600
CR	-0.013765	0.003740	-3.680395	0.0003
SIZE	0.052178	0.006173	8.451901	0.0000
GROWTH	0.001184	0.000537	2.205245	0.0282
DEBT	-0.107287	0.033364	-3.215681	0.0014

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935308	Mean dependent var	0.212669
Adjusted R-squared	0.917984	S.D. dependent var	0.178775
S.E. of regression	0.051198	Akaike info criterion	-2.919501
Sum squared resid	0.773276	Schwarz criterion	-2.081757
Log likelihood	627.4064	Hannan-Quinn criter.	-2.586912
F-statistic	53.98811	Durbin-Watson stat	1.632594
Prob(F-statistic)	0.000000		

Hausman's 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	20.225446	5	0.0011

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
AP	0.000078	0.000040	0.000000	0.0039
CR	-0.013765	-0.013462	0.000000	0.6062
SIZE	0.052178	0.033644	0.000035	0.0018
GROWTH	0.001184	0.003830	0.000001	0.0086
DEBT	-0.107287	-0.136920	0.000136	0.0110

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:32
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.400967	0.121774	-3.292722	0.0011
AP	7.78E-05	5.77E-05	1.347152	0.1790
CR	-0.013765	0.003089	-4.456875	0.0000
SIZE	0.052178	0.009372	5.567336	0.0000
GROWTH	0.001184	0.003354	0.353069	0.7243
DEBT	-0.107287	0.040550	-2.645795	0.0086

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.935308	Mean dependent var	0.212669
Adjusted R-squared	0.917984	S.D. dependent var	0.178775
S.E. of regression	0.051198	Akaike info criterion	-2.919501
Sum squared resid	0.773276	Schwarz criterion	-2.081757
Log likelihood	627.4064	Hannan-Quinn criter.	-2.586912
F-statistic	53.98811	Durbin-Watson stat	1.632594
Prob(F-statistic)	0.000000		

Model 4

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:35
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.254591	0.037868	-6.723129	0.0000
CCC	-3.22E-05	6.34E-06	-5.082712	0.0000
CR	-0.014412	0.003116	-4.625901	0.0000
SIZE	0.041349	0.002792	14.81034	0.0000
GROWTH	0.001845	0.000942	1.958818	0.0511
DEBT	-0.087961	0.034948	-2.516897	0.0124

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935644	Mean dependent var	0.212669
Adjusted R-squared	0.918409	S.D. dependent var	0.178775
S.E. of regression	0.051065	Akaike info criterion	-2.924705
Sum squared resid	0.769263	Schwarz criterion	-2.086961
Log likelihood	628.3822	Hannan-Quinn criter.	-2.592116
F-statistic	54.28929	Durbin-Watson stat	1.692564
Prob(F-statistic)	0.000000		

Hausman's 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	17.494964	5	0.0037

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CCC	-0.000032	-0.000045	0.000000	0.0092
CR	-0.014412	-0.013619	0.000000	0.1749
SIZE	0.041349	0.024802	0.000043	0.0113
GROWTH	0.001845	0.003805	0.000001	0.0491
DEBT	-0.087961	-0.112426	0.000145	0.0425

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/02/12   Time: 15:37
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.254591	0.128224	-1.985514	0.0480
CCC	-3.22E-05	1.76E-05	-1.833994	0.0677
CR	-0.014412	0.003029	-4.758804	0.0000
SIZE	0.041349	0.009984	4.141657	0.0000
GROWTH	0.001845	0.003338	0.552693	0.5809
DEBT	-0.087961	0.041498	-2.119616	0.0349

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935644	Mean dependent var	0.212669
Adjusted R-squared	0.918409	S.D. dependent var	0.178775
S.E. of regression	0.051065	Akaike info criterion	-2.924705
Sum squared resid	0.769263	Schwarz criterion	-2.086961
Log likelihood	628.3822	Hannan-Quinn criter.	-2.592116
F-statistic	54.28929	Durbin-Watson stat	1.692564
Prob(F-statistic)	0.000000		

Model 5

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/07/12   Time: 19:01
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.354075	0.040383	-8.767932	0.0000
WCIP	-0.039552	0.018926	-2.089875	0.0375
WCFP	-0.011516	0.054759	-0.210304	0.8336
CR	-0.014379	0.004469	-3.217939	0.0014
SIZE	0.050816	0.002613	19.44630	0.0000
GROWTH	0.002148	0.000709	3.028880	0.0027
DEBT	-0.105909	0.036233	-2.923022	0.0037

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935276	Mean dependent var	0.212669
Adjusted R-squared	0.917663	S.D. dependent var	0.178775
S.E. of regression	0.051298	Akaike info criterion	-2.913667
Sum squared resid	0.773663	Schwarz criterion	-2.065451
Log likelihood	627.3126	Hannan-Quinn criter.	-2.576921
F-statistic	53.10413	Durbin-Watson stat	1.684710
Prob(F-statistic)	0.000000		

Hausman's 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	17.322339	6	0.0082

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
WCIP	-0.039552	-0.020080	0.000104	0.0564
WCFP	-0.011516	-0.004760	0.000075	0.4360
CR	-0.014379	-0.013774	0.000000	0.3473
SIZE	0.050816	0.033231	0.000033	0.0024
GROWTH	0.002148	0.004259	0.000001	0.0214
DEBT	-0.105909	-0.135824	0.000132	0.0094

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/07/12   Time: 19:07
Sample: 2006 2010
Periods included: 5
Cross-sections included: 75
Total panel (balanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.354075	0.116925	-3.028222	0.0027
WCIP	-0.039552	0.037894	-1.043742	0.2975
WCFP	-0.011516	0.043409	-0.265294	0.7910
CR	-0.014379	0.004027	-3.570952	0.0004
SIZE	0.050816	0.009201	5.523053	0.0000
GROWTH	0.002148	0.003383	0.635027	0.5259
DEBT	-0.105909	0.041634	-2.543806	0.0115

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.935276	Mean dependent var	0.212669
Adjusted R-squared	0.917663	S.D. dependent var	0.178775
S.E. of regression	0.051298	Akaike info criterion	-2.913667
Sum squared resid	0.773663	Schwarz criterion	-2.065451
Log likelihood	627.3126	Hannan-Quinn criter.	-2.576921
F-statistic	53.10413	Durbin-Watson stat	1.684710
Prob(F-statistic)	0.000000		

Appendix 5 : List of firms under Industrial Products (Manufacturing) Sector

No.	Company Name	No.	Company Name
1	ABRIC BHD	39	EVERGREEN FIBREBOARD
2	ADVANCED PACK.TECH.(M)	40	FACB INDUSTRIES INC
3	ADVENTA BERHAD	41	FIMA CORPORATION BHD
4	AE MULTI HOLDINGS	42	FRONTKEN CORP BHD
5	AJIYA BERHAD	43	FURNIWEB INDL.PRDS.
6	ANCOM BERHAD	44	GE-SHEN CORP BHD
7	ANN JOO RESOURCES	45	GOODWAY INTEGRATED INDS.
8	APB RESOURCES BHD	46	GPA HOLDINGS BERHAD
9	APM AUTOMOTIVE HDG.	47	GSB GROUP BHD
10	A-RANK BERHAD	48	GUH HOLDINGS BHD
11	ASTINO BERHAD	49	HEXZA CORP BHD
12	ASTRAL SUPREME BHD	50	HIAP TECK VENTURE
13	ATLAN HOLDINGS BHD	51	IMASPRO CORP BHD
14	ATURMAJU RESRCS BHD	52	INTEGRATED RUBBER
15	AUTOAIR HOLDINGS	53	IRE-TEX CORPORATION
16	BRIGHT PACKAGING IND.	54	IRM GROUP BERHAD
17	BTM RESOURCES BHD	55	JADI IMAGING HLDGS
18	CAN-ONE BERHAD	56	JASA KITA BERHAD
19	CENTRAL INDUSTRIAL	57	JAVA BERHAD
20	CENTURY BOND BERHAD	58	JAYA TIASA HLDGS BHD
21	CHEMICAL MALAYSIA	59	JMR CONGLOMERATION
22	CHIN WELL HOLDINGS	60	JOHORE TIN BERHAD
23	CN ASIA CORP	61	KECK SENG (M) BHD
24	COASTAL CONTRACTS	62	KEIN HING INTN'L BHD
25	COMINTEL CORP BHD	63	KIA LIM BERHAD
26	COMPUTER FORMS BHD	64	KINSTEEL BHD
27	CONCRETE ENGR.PRDS.	65	KKB ENGINEERING
28	CSC STEEL HLDGS BHD	66	KOBAY TECHNOLOGY BHD
29	CYL CORPORATION BHD	67	KOMARKCORP BERHAD
30	DAIBOCHI PLASTIC & PACK. INDUSTRY	68	KOSSAN RUBBER
31	DENKO INDUSTRIAL COR	69	KUMPULAN H&L HIGH TECH
32	D'NONCE TECHNOLOGY	70	KUMPULAN POWERNET
33	DOMINANT ENTERPRISE	71	KYM HOLDINGS BHD
34	EG INDUSTRIES BHD	72	LAFARGE MALAYAN CEMENT
35	EKSONS CORP BHD	73	LATEXX PARTNERS
36	EONMETALL GRP BHD	74	LB ALUMINIUM BERHAD
37	EP MANUFACTURING	75	LCTH CORP BHD
38	ETI TECH CORP	76	LION INDUSTRIES
		77	LIPO CORPORATION BHD

No.	Company Name	No.	Company Name
78	MAJOR TEAM HOLDINGS	113	STONE MASTER CORPOR
79	MALAYSIA AICA BERHAD	114	SUBUR TIASA HOLDINGS
80	MALAYSIA PACKAGING IND.	115	SUPER ENTERPRISE HDG.
81	MALAYSIA SMELTING	116	SUPERMAX CORP BHD
82	MALAYSIAN AE MODELS HDG.	117	TA WIN HOLDINGS
83	MAXTRAL INDUSTRY BHD	118	TASEK CORPORATION
84	MERCURY INDUSTRIES	119	TECK GUAN PERDANA
85	METAL RECLAMATION	120	TECNIC GROUP BERHAD
86	METROD HOLDINGS	121	TEKALA CORP BHD
87	MIECO CHIPBOARD	122	TIEN WAH PRESS HOLDINGS
88	MUDA HOLDINGS BERHAD	123	TIGER SYNERGY BERHAD
89	MULTICODE ELTN.INDS.	124	TIMBERWELL BERHAD
90	NWP HOLDINGS BERHAD	125	TOYO INK GROUP BHD
91	NYLEX (MALAYSIA) BHD	126	UAC BERHAD
92	OKA CORPORATION BHD	127	UCHI TECHNOLOGIES
93	P.I.E. INDUSTRIAL	128	UMS-NEIKEN GROUP
94	PELANGI PUBLISHING GP.	129	UNITED BINTANG BHD
95	PENSONIC HOLDINGS	130	UNITED U-LI CORPOR
96	PERMAJU INDUSTRIES	131	V.S. INDUSTRY BERHAD
97	PERSTIMA.MAL.(PERSTIMA)	132	VERSATILE CREATIVE
98	PETRON MAL.REFN.& MKTG.	133	WAH SEONG CORP
99	PNE PCB BERHAD	134	WATTA HOLDINGS
100	POLY GLASS FIBRE (M)	135	WAWASAN TKH HOLDINGS
101	PREMIUM NALFIN	136	WEIDA (M) BERHAD
102	PRESS METAL BERHAD	137	WONG ENGINEERING
103	PRICEWORTH INTERNATIONAL	138	WTK HOLDINGS BHD
104	QUALITY CONCRETE HDG.	139	YA HORNG ELECTRONIC (M)
105	SAPURA INDUSTRIAL	140	YI-LAI BHD
106	SARAWAK CONS.INDS.	141	YLI HOLDINGS BHD
107	SCIENTEX BERHAD	142	YOKOHAMA INDUSTRIES
108	SEACERA GROUP	143	YUNG KONG GALVANISING INDS.
109	SIG GASES BERHAD		
110	SKB SHUTTERS CORP		
111	SKP RESOURCES BERHAD		
112	SMIS CORPORATION BHD		

Appendix 6 :   Descriptive Statistics of Manufacturing Sector

Date: 12/01/12
Time: 14:39

Sample: 2006 2010

	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
Mean	0.174947	101.0797	127.7287	46.86771	181.9407	0.509888	0.295007	2.731273	12.02627	0.100367	0.226643
Median	0.171600	85.00000	87.00000	41.57000	129.0900	0.510000	0.270000	1.680000	11.88000	0.054100	0.230000
Maximum	0.512100	726.0000	3084.000	209.5100	3534.120	0.900000	0.780000	24.43000	16.28000	12.88740	0.760000
Minimum	-0.082600	14.00000	1.000000	0.420000	-13.81000	0.080000	0.030000	0.100000	8.780000	-0.693700	0.000000
Std. Dev.	0.081068	73.54755	177.8738	32.49548	215.3094	0.164702	0.158259	2.984950	1.302685	0.569292	0.170530
Skewness	0.272944	3.589795	8.440477	1.440184	7.370632	-0.061553	0.424943	3.411193	0.375579	16.19386	0.339700
Kurtosis	3.715121	22.90307	116.3309	6.314283	92.70227	2.419572	2.457824	18.17456	2.966510	358.3178	2.254111
Jarque-Bera	24.11314	13337.09	391130.6	574.4129	246192.5	10.48822	30.27615	8246.701	16.84300	3792471.	30.32599
Probability	0.000006	0.000000	0.000000	0.000000	0.000000	0.005279	0.000000	0.000000	0.000220	0.000000	0.000000
Sum	125.0872	72272.00	91326.00	33510.41	130087.6	364.5700	210.9300	1952.860	8598.780	71.76240	162.0500
Sum Sq. Dev.	4.692368	3862198.	22590315	753952.8	33099713	19.36839	17.88267	6361.688	1211.649	231.4030	20.76334
Observations	715	715	715	715	715	715	715	715	715	715	715

Appendix 7 : Pearson's Correlation Matrix of Manufacturing Sector

Covariance Analysis: Ordinary
Date: 12/04/12   Time: 20:00
Sample: 2006 2010
Included observations: 715

Correlation t-Statistic Probability	GOP	ARD	INV	AP	CCC	WCIP	WCFP	CR	SIZE	GROWTH	DEBT
GOP	1.000000										

ARD	-0.339062	1.000000									
	-9.623715	-----									
	0.0000	-----									
INV	-0.254684	0.457791	1.000000								
	-7.032485	13.74930	-----								
	0.0000	0.0000	-----								
AP	0.034273	0.230496	0.226831	1.000000							
	0.915692	6.325034	6.218945	-----							
	0.3601	0.0000	0.0000	-----							
CCC	-0.331395	0.684998	0.948274	0.115202	1.000000						
	-9.378912	25.10599	79.76230	3.096760	-----						
	0.0000	0.0000	0.0000	0.0020	-----						
WCIP	0.179840	0.110890	0.093648	-0.277321	0.157099	1.000000					
	4.881699	2.979375	2.511625	-7.707354	4.247609	-----					
	0.0000	0.0030	0.0122	0.0000	0.0000	-----					
WCFP	-0.031328	-0.069452	-0.050712	0.084677	-0.078399	0.049896	1.000000				

	-0.836936	-1.858988	-1.355861	2.269207	-2.099869	1.333988	-----				
	0.4029	0.0634	0.1756	0.0236	0.0361	0.1826	-----				
CR	-0.043167	0.040613	0.035051	-0.271053	0.083738	0.323812	-0.628254	1.000000			
	-1.153726	1.085334	0.936514	-7.519154	2.243865	9.138828	-21.56231	-----			
	0.2490	0.2781	0.3493	0.0000	0.0251	0.0000	0.0000	-----			
SIZE	0.258609	-0.465709	-0.311450	-0.230838	-0.381541	0.075244	0.299470	-0.212593	1.000000		
	7.148572	-14.05229	-8.751639	-6.334941	-11.02170	2.014890	8.381111	-5.809482	-----		
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0443	0.0000	0.0000	-----		
GROWTH	0.096328	-0.174448	-0.077338	-0.020291	-0.120419	-0.006999	0.066454	-0.071031	0.140605	1.000000	
	2.584163	-4.730661	-2.071289	-0.541920	-3.238997	-0.186897	1.778378	-1.901490	3.792127	-----	
	0.0100	0.0000	0.0387	0.5880	0.0013	0.8518	0.0758	0.0576	0.0002	-----	
DEBT	-0.184220	-0.084197	-0.062019	-0.026963	-0.075927	-0.271973	0.738587	-0.552430	0.292627	0.069284	1.000000
	-5.004721	-2.256257	-1.659217	-0.720229	-2.033279	-7.546702	29.25394	-17.69644	8.171449	1.854471	-----
	0.0000	0.0244	0.0975	0.4716	0.0424	0.0000	0.0000	0.0000	0.0000	0.0641	-----

Appendix 8 : Eview Output for Manufacturing Sector

Model 1

Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:12
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.608112	0.088368	-6.881601	0.0000
ARD	-5.85E-05	3.10E-05	-1.887267	0.0596
CR	-0.003065	0.000607	-5.048801	0.0000
SIZE	0.071013	0.007627	9.311217	0.0000
GROWTH	-4.52E-05	0.004774	-0.009471	0.9924
DEBT	-0.250041	0.026863	-9.307964	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.753327	Mean dependent var	0.174947
Adjusted R-squared	0.689375	S.D. dependent var	0.081068
S.E. of regression	0.045182	Akaike info criterion	-3.174174
Sum squared resid	1.157480	Schwarz criterion	-2.227744
Log likelihood	1282.767	Hannan-Quinn criter.	-2.808682
F-statistic	11.77953	Durbin-Watson stat	1.989805
Prob(F-statistic)	0.000000		

Hausman's 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	47.896753	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ARD	-0.000059	-0.000190	0.000000	0.0000
CR	-0.003065	-0.003830	0.000000	0.0851
SIZE	0.071013	0.025899	0.000048	0.0000
GROWTH	-0.000045	0.004751	0.000001	0.0000
DEBT	-0.250041	-0.211737	0.000548	0.1018

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:17
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.608112	0.097652	-6.227321	0.0000
ARD	-5.85E-05	4.94E-05	-1.185398	0.2364
CR	-0.003065	0.001098	-2.790848	0.0054
SIZE	0.071013	0.007913	8.974146	0.0000
GROWTH	-4.52E-05	0.003504	-0.012903	0.9897
DEBT	-0.250041	0.033972	-7.360295	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.753327	Mean dependent var	0.174947
Adjusted R-squared	0.689375	S.D. dependent var	0.081068
S.E. of regression	0.045182	Akaike info criterion	-3.174174
Sum squared resid	1.157480	Schwarz criterion	-2.227744
Log likelihood	1282.767	Hannan-Quinn criter.	-2.808682
F-statistic	11.77953	Durbin-Watson stat	1.989805
Prob(F-statistic)	0.000000		

Model 2

Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:25
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.682733	0.103719	-6.582539	0.0000
INV	1.21E-05	2.06E-05	0.588136	0.5567
CR	-0.002871	0.000633	-4.534054	0.0000
SIZE	0.076576	0.008962	8.544163	0.0000
GROWTH	0.000464	0.005357	0.086595	0.9310
DEBT	-0.251505	0.027085	-9.285821	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.752873	Mean dependent var	0.174947
Adjusted R-squared	0.688803	S.D. dependent var	0.081068
S.E. of regression	0.045224	Akaike info criterion	-3.172334
Sum squared resid	1.159612	Schwarz criterion	-2.225904
Log likelihood	1282.109	Hannan-Quinn criter.	-2.806842
F-statistic	11.75078	Durbin-Watson stat	1.972828
Prob(F-statistic)	0.000000		

Hausman's 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	59.022143	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
INV	0.000012	-0.000035	0.000000	0.0000
CR	-0.002871	-0.003332	0.000000	0.2802
SIZE	0.076576	0.031075	0.000041	0.0000
GROWTH	0.000464	0.006411	0.000001	0.0000
DEBT	-0.251505	-0.213151	0.000544	0.1002

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:28
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.682733	0.089265	-7.648354	0.0000
INV	1.21E-05	2.02E-05	0.600133	0.5487
CR	-0.002871	0.001088	-2.639016	0.0085
SIZE	0.076576	0.007369	10.39143	0.0000
GROWTH	0.000464	0.003502	0.132470	0.8947
DEBT	-0.251505	0.034026	-7.391609	0.0000

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.752873	Mean dependent var	0.174947
Adjusted R-squared	0.688803	S.D. dependent var	0.081068
S.E. of regression	0.045224	Akaike info criterion	-3.172334
Sum squared resid	1.159612	Schwarz criterion	-2.225904
Log likelihood	1282.109	Hannan-Quinn criter.	-2.806842
F-statistic	11.75078	Durbin-Watson stat	1.972828
Prob(F-statistic)	0.000000		

Model 3

Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:31
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.710946	0.117026	-6.075135	0.0000
AP	0.000190	0.000157	1.206945	0.2280
CR	-0.002491	0.000522	-4.769546	0.0000
SIZE	0.078126	0.009377	8.331737	0.0000
GROWTH	0.000458	0.004899	0.093429	0.9256
DEBT	-0.246248	0.024076	-10.22791	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.754238	Mean dependent var	0.174947
Adjusted R-squared	0.690522	S.D. dependent var	0.081068
S.E. of regression	0.045098	Akaike info criterion	-3.177875
Sum squared resid	1.153204	Schwarz criterion	-2.231445
Log likelihood	1284.090	Hannan-Quinn criter.	-2.812383
F-statistic	11.83750	Durbin-Watson stat	1.970876
Prob(F-statistic)	0.000000		

Hausman's 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	53.464356	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
AP	0.000190	0.000135	0.000000	0.2292
CR	-0.002491	-0.002917	0.000000	0.2798
SIZE	0.078126	0.034990	0.000038	0.0000
GROWTH	0.000458	0.007155	0.000001	0.0000
DEBT	-0.246248	-0.213945	0.000522	0.1574

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:34
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.710946	0.087841	-8.093525	0.0000
AP	0.000190	0.000101	1.874189	0.0614
CR	-0.002491	0.001104	-2.256040	0.0244
SIZE	0.078126	0.007191	10.86378	0.0000
GROWTH	0.000458	0.003485	0.131331	0.8956
DEBT	-0.246248	0.033987	-7.245363	0.0000

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.754238	Mean dependent var	0.174947
Adjusted R-squared	0.690522	S.D. dependent var	0.081068
S.E. of regression	0.045098	Akaike info criterion	-3.177875
Sum squared resid	1.153204	Schwarz criterion	-2.231445
Log likelihood	1284.090	Hannan-Quinn criter.	-2.812383
F-statistic	11.83750	Durbin-Watson stat	1.970876
Prob(F-statistic)	0.000000		

Model 4

Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:36
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.657877	0.105087	-6.260300	0.0000
CCC	-3.72E-06	1.81E-05	-0.205500	0.8373
CR	-0.002884	0.000619	-4.655538	0.0000
SIZE	0.074677	0.009054	8.247974	0.0000
GROWTH	0.000259	0.005217	0.049671	0.9604
DEBT	-0.250308	0.027402	-9.134593	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.752736	Mean dependent var	0.174947
Adjusted R-squared	0.688631	S.D. dependent var	0.081068
S.E. of regression	0.045236	Akaike info criterion	-3.171782
Sum squared resid	1.160252	Schwarz criterion	-2.225352
Log likelihood	1281.912	Hannan-Quinn criter.	-2.806290
F-statistic	11.74217	Durbin-Watson stat	1.982407
Prob(F-statistic)	0.000000		

Hausman's 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	56.878507	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CCC	-0.000004	-0.000052	0.000000	0.0000
CR	-0.002884	-0.003363	0.000000	0.2709
SIZE	0.074677	0.028245	0.000044	0.0000
GROWTH	0.000259	0.005624	0.000001	0.0000
DEBT	-0.250308	-0.209424	0.000556	0.0831

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 11/27/12   Time: 21:39
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.657877	0.092354	-7.123418	0.0000
CCC	-3.72E-06	1.71E-05	-0.217078	0.8282
CR	-0.002884	0.001089	-2.649049	0.0083
SIZE	0.074677	0.007594	9.833775	0.0000
GROWTH	0.000259	0.003507	0.073889	0.9411
DEBT	-0.250308	0.034053	-7.350594	0.0000

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.752736	Mean dependent var	0.174947
Adjusted R-squared	0.688631	S.D. dependent var	0.081068
S.E. of regression	0.045236	Akaike info criterion	-3.171782
Sum squared resid	1.160252	Schwarz criterion	-2.225352
Log likelihood	1281.912	Hannan-Quinn criter.	-2.806290
F-statistic	11.74217	Durbin-Watson stat	1.982407
Prob(F-statistic)	0.000000		

Model 5

Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/07/12   Time: 17:48
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715
White cross-section standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.709407	0.065907	-10.76378	0.0000
WCIP	0.177296	0.033028	5.367987	0.0000
WCFP	-0.123432	0.033917	-3.639187	0.0003
CR	-0.004897	0.001176	-4.165119	0.0000
SIZE	0.070162	0.004565	15.36978	0.0000
GROWTH	-0.000457	0.006165	-0.074177	0.9409

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.742706	Mean dependent var	0.174947
Adjusted R-squared	0.676000	S.D. dependent var	0.081068
S.E. of regression	0.046144	Akaike info criterion	-3.132016
Sum squared resid	1.207320	Schwarz criterion	-2.185586
Log likelihood	1267.696	Hannan-Quinn criter.	-2.766524
F-statistic	11.13402	Durbin-Watson stat	1.931575
Prob(F-statistic)	0.000000		

Hausman's 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	51.062644	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
WCIP	0.177296	0.152897	0.000585	0.3133
WCFP	-0.123432	-0.122142	0.000387	0.9477
CR	-0.004897	-0.004847	0.000000	0.9345
SIZE	0.070162	0.028245	0.000040	0.0000
GROWTH	-0.000457	0.006713	0.000001	0.0000

Cross-section random effects test equation:
Dependent Variable: GOP
Method: Panel Least Squares
Date: 12/07/12   Time: 18:00
Sample: 2006 2010
Periods included: 5
Cross-sections included: 143
Total panel (balanced) observations: 715

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.709407	0.086443	-8.206684	0.0000
WCIP	0.177296	0.035283	5.025007	0.0000
WCFP	-0.123432	0.033923	-3.638546	0.0003
CR	-0.004897	0.001376	-3.558153	0.0004
SIZE	0.070162	0.007310	9.597676	0.0000
GROWTH	-0.000457	0.003581	-0.127696	0.8984

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.742706	Mean dependent var	0.174947
Adjusted R-squared	0.676000	S.D. dependent var	0.081068
S.E. of regression	0.046144	Akaike info criterion	-3.132016
Sum squared resid	1.207320	Schwarz criterion	-2.185586
Log likelihood	1267.696	Hannan-Quinn criter.	-2.766524
F-statistic	11.13402	Durbin-Watson stat	1.931575
Prob(F-statistic)	0.000000		

Appendix 9 :

Test for Equality of Means Profitability between Manufacturing and Services sector

Test for Equality of Means Between Series
Date: 12/07/12   Time: 16:18
Sample: 2006 2010
Included observations: 715

Method	df	Value	Probability
t-test	1088	4.783159	0.0000
Satterthwaite-Welch t-test*	456.2398	3.882074	0.0001
Anova F-test	(1, 1088)	22.87861	0.0000
Welch F-test*	(1, 456.24)	15.07050	0.0001

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between	1	0.350025	0.350025
Within	1088	16.64555	0.015299
Total	1089	16.99557	0.015607

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
GOPSERVICES	375	0.212669	0.178775	0.009232
GOPMANUFACTURING	715	0.174947	0.081068	0.003032
All	1090	0.187925	0.124926	0.003784