



The Impact of Micro and Macro Environment on Profitability
of Technology Companies in Thailand

Mr. Doma Rema Marak

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Business Administration in Finance

Graduate School of Business

Assumption University

Academic Year 2014

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**THE IMPACT OF MICRO AND MACRO ENVIRONMENT ON PROFITABILITY
OF TECHNOLOGY COMPANIES IN THAILAND**

by

DOMA REMA MARAK

A Thesis submitted in partial fulfillment
of the requirements for the degree of

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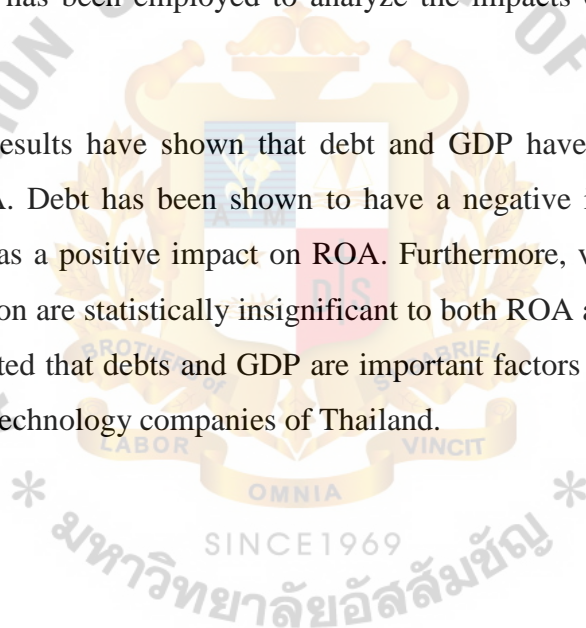
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ABSTRACT

This study aims to investigate the impact of micro environment in terms of assets, capital, debt and liquidity and macro environment in terms of gross domestic product (GDP) and inflation on profitability in terms of return on assets (ROA) and return on equity (ROE) of thirty listed companies of technology industry, which includes electronic components sector and information and communication technology sector, in the Stock Exchange of Thailand from 2003 to 2012.

In this study, data have been collected from secondary data, which were financial statements of thirty technology companies. Then, from the information of the financial statements, data have been calculated in Microsoft excel to find out the value of all the variables for each company. In order to achieve the research objectives, the multiple regression analysis has been employed to analyze the impacts of independent variables on dependent variable.

The study results have shown that debt and GDP have an impact and statistically significant on ROA. Debt has been shown to have a negative impact on ROA and on the other hand, GDP has a positive impact on ROA. Furthermore, variables like assets, capital, liquidity and inflation are statistically insignificant to both ROA and ROE. Thus, the findings of this study indicated that debts and GDP are important factors that have been affecting the profitability of the technology companies of Thailand.



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CONTENTS

	Page
CHAPTER 1: GENERALITIES OF THE STUDY	1-18
1.1 Introduction of the study	1
1.2 Research Objectives	8
1.3 Statement of the Problem	9
1.4 Scope of Research	13
1.5 Limitations of the Research	14
1.6 Significance of the Study	15
1.7 Definition of Terms	16
CHAPTER 2: LITERATURE REVIEW	19-41
2.1 Theory: Definitions and Concepts of the Independent Variable	20
2.1.1 Assets	20
2.1.2 Capital	21
2.1.3 Debt (Loan)	22
2.1.4 Liquidity	22
2.1.5 Gross Domestic Product	23
2.1.6 Inflation	23
2.2 Theory: Definitions and Concepts of the Dependent Variable	24
2.2.1 Return on Asset (ROA)	24
2.2.2 Return on Equity (ROE)	24
2.3 Related Literature Reviews	25
2.3.1 Relationship between Assets and Profitability	25
2.3.2 Relationship between Capital and Profitability	26
2.3.3 Relationship between Debt (Loan) and Profitability	26
2.3.4 Relationship between Liquidity and Profitability	27
2.3.5 Relationship between Gross Domestic Product (GDP) and Profitability	28
2.3.6 Relationship between Inflation and Profitability	28
2.4 Previous Studies	29

CHAPTER 3: RESEARCH FRAMEWORK	42-50
3.1 Theoretical Framework	42
3.2 Conceptual Framework	46
3.3 Research Hypothesis	47
3.4 Operationalization of the Independent Variables and Dependent Variables	48
CHAPTER 4: RESEARCH METHODOLOGY	51-60
4.1 Methods of Research Used	51
4.1.1 Types of Research or Technique	51
4.1.2 Research Method	52
4.2 Respondents and Sampling Procedure	52
4.2.1 Target Population and Sample Size	53
4.3 Collection of Data/Gather Procedures	54
4.4 Statistical Treatment of Data	55
4.4.1 Descriptive Statistics	55
4.4.2 Multiple Regression Analysis	56
CHAPTER 5: PRESENTATION OF DATA AND CRITICAL DISCUSSION OF THE RESULTS	61-73
5.1 Descriptive Analysis of Variables	61
5.2 Hypotheses Testing	64
CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATIONS	74-86
6.1 Summary of Findings	74
6.1.1 Summary of Descriptive Findings	74
6.1.2 Summary of Hypotheses Testing	75
6.2 Discussions and Implications	76
6.2.1 Descriptive Results	76
6.2.2 Hypotheses Results: Multiple Regression Analysis	79
6.3 Conclusion	82
6.4 Recommendations	83
6.4.1 Recommendation on Descriptive Analysis	83
6.4.2 Recommendation on the Result of Hypotheses	83

6.5 Further Study

86

BIBLIOGRAPHY

87-99

APPENDIX

100-132



LIST OF FIGURES

	Page
Figure 1.1 High Technology Exports of the World from 2004 to 2011	3
Figure 1.2 Dow Jones Technology Index from 2009 to 2014	4
Figure 1.3 Thailand Exports from 1991 to 2004 April	5
Figure 1.4 Average Profitability of Technology Industry compared to GDP and Inflation of Thailand from 2003 to 2012	10
Figure 1.5 Highest Export Value of the World	11
Figure 2.1 Types of Business Environment	19
Figure 2.2 Business Environment Technology Companies, Thailand	19
Figure 3.1 Factors Affecting Bank Profitability	43
Figure 3.2 The Determinants of the Profitability	44
Figure 3.3 Bank-specific and Macro Economic Profitability Determinants	45
Figure 3.4 A Modified Conceptual Framework of the impact of Micro and Macro Environment Factors on Profitability	46
Figure 6.2 Average Values of Variables in Years	77



LIST OF TABLES

	Page
Table 1.1 Top Ten Thai Export Products	7
Table 2.4.1 Summary of Previous Studies	34
Table 3.1 Operationalization Table	48
Table 4.1 Summary of Statistical Treatment of Hypothesis Testing in the Study	60
Table 5.1 Descriptive Analysis of Variables	61
Table 5.2.1 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Asset (ROA)	64
Table 5.2.2 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Asset (ROA)	65
Table 5.2.3 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Asset (ROA)	65
Table 5.3.1 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Asset (ROA)	66
Table 5.3.2 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Asset (ROA)	67
Table 5.3.3 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Asset (ROA)	67
Table 5.4.1 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Equity (ROE)	68
Table 5.4.2 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Equity (ROE)	69
Table 5.4.3 Analysis of the Impact of Micro Environment in Terms of Assets, Capital, Debt (loan) and Liquidity on Profitability in Terms of Return on Equity (ROE)	69

Table 5.5.1 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Equity (ROE)	70
Table 5.5.2 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Equity (ROE)	71
Table 5.5.3 Analysis of the Impact of Micro Environment in Terms of GDP and Inflation on Profitability in Terms of Return on Equity (ROE)	71
Table 5.3 Summary of Hypotheses Results	72
Table 6.1 Descriptive Statistics	74



CHAPTER 1

GENERALITIES TO THE STUDY

1.1 Introduction of the study

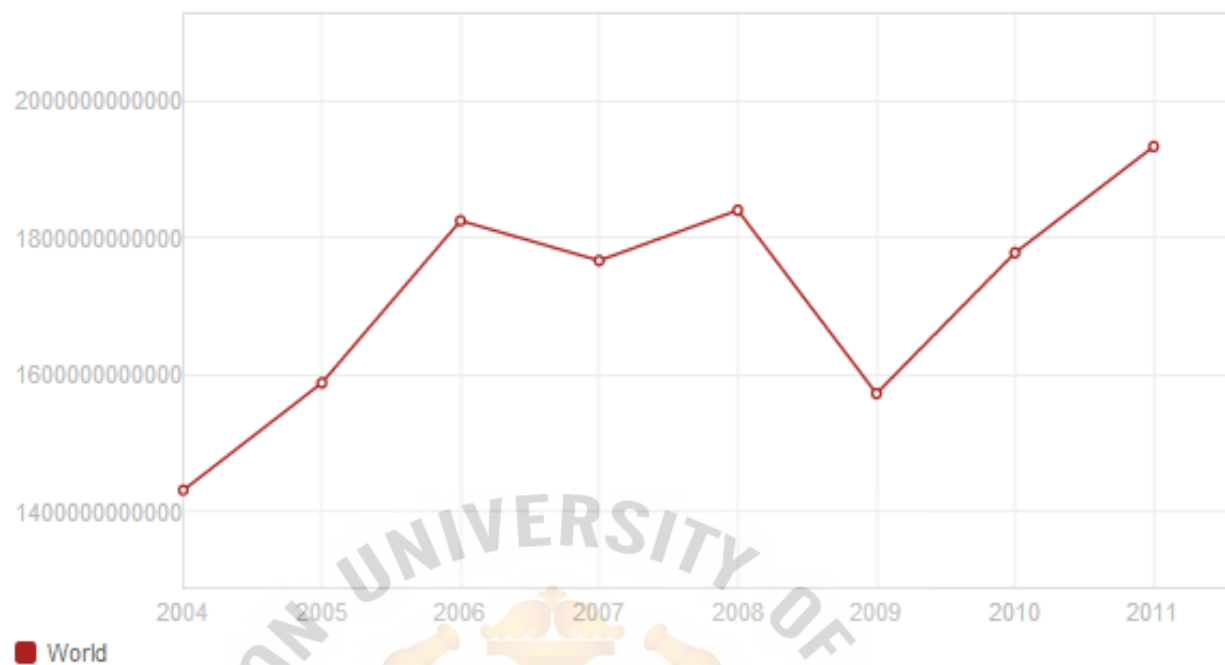
A firm's profitability is generally regarded as an important precondition for long term firm survival and success and also effects its economic growth, employment, innovation and technological change (Yazdanfar, 2013). Further, Hofstrand (2009) also stated that measuring profitability is the most important measure of the success of a business. A business that is not profitable cannot survive and a business that is highly profitable has the ability to reward its owners with a large return on their investment. For instance, according to the Board of Investment Thailand (BOI) in the past ten years, Western Digital has grown an average of 35% annually by employing 38,000 local employees and with a total of 650,000 square feet of production space near Bangkok, currently producing about 60% of the hard drives in Thailand (http://www.boi.go.th/tir/issue/201202_22_2/42.htm accessed the data on 6/6/2014 at 7:00 pm). During 2011, the electrical and electronics industry contributed almost 24% of Thailand's annual export revenues by generating US\$55 worth of revenue billion (http://www.boi.go.th/index.php?page=pdf_page&menu_id=90 accessed the data on 6/6/2014 at 7:00 pm). In addition, return on assets (ROA) influenced the profitability of a firm by expressing the company's ability to generate profit as a consequence of the productive use of resources and efficient management (Burja, 2011), likewise, return on equity (ROE) influenced the profitability of a firm by measuring the profitability of equity funds invested in the firm by shareholders (Chandra, 2008).

The micro and macro environment plays an important role in the firm's profitability. Firstly in the micro environment, Mcfarland (2004) explains that capital assets, plant, property and equipment should be scrutinized as intensely as all other business processes and systems should be established in order to ensure that assets are monitored and managed throughout the asset life cycle from acquisition to disposition because if an asset is underutilized, the cost of ownership exceeds the benefits derived from the asset or it does not satisfy current or future capabilities and requirements. Abor (2005) explains that a firm can choose many alternative capital structures. However, in attempts to find the particular combination that maximizes its overall market value, debt should be well controlled otherwise if the debt content is increased aggressively it will adversely impact profitability. Moreover, the companies are exposing themselves to more risk and they can lose control if they do it (Chisti

et al., 2013). Lamberg and Valming (2009) said, costs and benefits have to be carefully weighed for holding liquid assets against the opportunity costs for holding more productive but less liquid assets, thus, the companies that are carefully managed in the area of liquidity management would receive financial benefits for their actions. Secondly in the macro environment, Clark and Senik (2011) explained that economic development is generally identified with growth in GDP per capita which involves not only a quantitative increase in capital accumulation, production and consumption but also qualitative social and political changes that enlarge the choice set of the individuals concerned. Gokal and Hanif (2004) explained that inflation leads to lower levels of investment and economic growth. It may also reduce a country's international competitiveness, by making exports relatively more expensive, thus impacting on the balance of payments. Firms may have to devote more resources to deal with the effects of inflation. Therefore, making decisions according to the micro and macro environments is a crucial task for managers.

The Stock Exchange of Thailand (SET) has 634 companies that are listed under the SET. The SET includes many industries such as MAI industry, property and construction, services, consumer products, resources, technology, financials, agro and food industry and industrial sectors, such as property development, information and communication technology, energy and utilities, fashion, automotive, health care services, electronic components and so on. In the technology industry, the SET has 39 companies that are listed on the stock exchange and 5 companies that were delisted from the stock which came from two sectors, information and * communication technology and * electronic components (<http://www.set.or.th/en/company/companylist.html> accessed the data on 6/6/2014 at 11:50 pm).

Figure 1.1: High Technology Exports of the World from 2004 to 2011



Source: The World Bank.
<http://data.worldbank.org/indicator/TX.VAL.TECH.CD/countries?display=graph> accessed the data on 30/4/2014 at 9:30 pm.

Figure 1.1 shows the exports of high technology in the world which includes products such as high research and development intensity, aerospace, computers, pharmaceuticals, scientific instruments and electrical machinery. The figure explains that, prior to the financial crisis of 2004 - 2006, the exports of the high technology industry consistently increased from \$1,431 billion during 2004 to \$1,588 billion during 2005 and reached a peak during 2006 by exporting \$1,825 billion and then slightly decreased to \$1,766 billion during 2007 and then slightly increased back to \$1,840 billion during 2008. Surprisingly, the consequences of the global financial crisis of 2007 - 2008 devastated the growth of technology markets, thus, the export of high technology in the world dropped greatly to \$1,572 billion during 2009. However, a significant recovery and the never ending innovation of technology companies and the importance of technology energized the technology markets to rebound. Thus, the export of high technology in the world has consistently risen to \$1,778 billion during 2010 and \$1,933 billion during 2011, respectively (<http://data.worldbank.org/indicator/TX.VAL.TECH.CD/countries?display=graph> accessed the data on 30/4/2014 at 9:30 pm).

Figure 1.2: Dow Jones Technology Index from 2009 to 2014



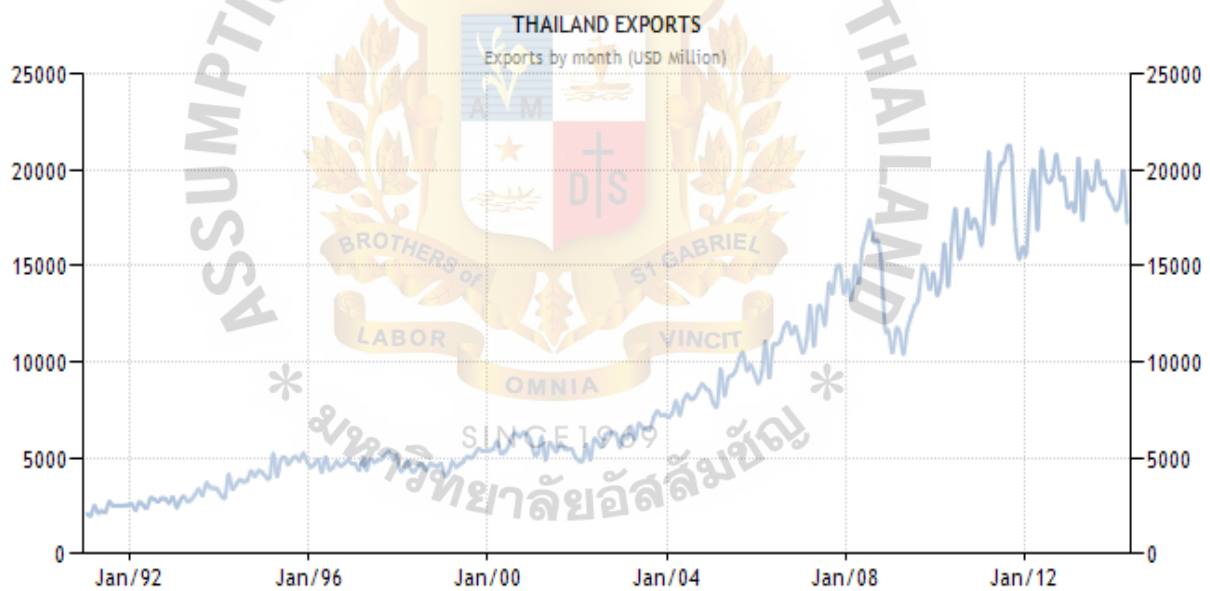
Source: Financial Times.

<http://markets.ft.com/research/Markets/Sectors-And-Industries/Technology> accessed the data on 31/5/2014 at 9:45 pm.

Figure 1.2 shows how technology companies trading on the stock market are performing in general. The Dow Jones Technology Index is comprised of seven industries such as semiconductors, computer services, electronic office equipment, software, telecommunications equipment, computer hardware and Internet companies. The figure explains that, right after the relaxation from the global financial crisis of 2007 to 2008 onwards the technology market has grown significantly. During 2009 and 2010 the technology sector has positively grown 29.57 per cent and 11.57 per cent respectively, which shows the quick recovery from the catastrophic global financial crisis. On 11th March, 2011 most surprisingly, Japan was hit by a Tsunami which was caused by an earthquake in the Pacific Ocean. Since Japan is a home of many technology companies, the catastrophic calamity in Japan hit the growth of technology for almost one year which hindered the growth of technology markets around the world by decreasing market growth by 0.83 per cent during the period of 2011. During 2012 and 2013 the technology market grew fast 12.41 per cent and 20.93 per cent respectively after having been affected by the catastrophic Tsunami in Japan. This indicates that the technology market is a positively growing market in the coming generation regardless of any conditions. (<http://markets.ft.com/research/Markets/Sectors-And-Industries/Technology> accessed the data on 31/5/2014 at 9:45 pm).

Likewise in other countries, according to the United Nations (UN) (2005) Thailand has also adapted the policy to align with the rapidly changing trends in the global economy. Realizing that the domestic market is small in Thailand, Thailand has shifted from an import substitution to an export oriented development strategy in order to build up a globally competitive industry and economy as a whole. Thus, the economic growth helps Thailand to reduce poverty and to increase industrial output and exports. Khunkitti (2001) explained that the proportion of the Thai population classified as “poor” declined from about 57 per cent in 1963 to about 16 per cent in 1996. Over the last few decades, the manufacturing sector has contributed significantly to the rapid export growth, thus, the share of manufactured exports as a percentage of total exports increased from 5 per cent in 1970 to 74 per cent in 2001 (UNCTAD, 2002). However, Intarakumnerd *et al.* (2002) claimed that the rapid expansion of the manufacturing sector was overshadowed by the growth in agriculture.

Figure 1.3: Thailand Exports from 1991 to 2014 April



Source: Trading Economics.

<http://www.tradingeconomics.com/thailand/exports> accessed the data on 4/6/2014 at 1:25 pm.

Figure 1.3 shows the exports of Thailand for twenty three and a half years which is from 1991 until April 2014. During the beginning of the nineties the exports of Thailand were growing healthily until a peak in 1996. Unknowingly on the 2nd of July, 1997 the panic began and by the end of the summer a crisis broke when Thailand devalued the Thai baht which is commonly called 1997–1998 Asian Financial Crisis, also called the Tom Yam Kung Crisis

by Thai locals. Initially the crisis affected only Thailand, Malaysia, the Philippines and Singapore but in late October 1997 the crisis spread to wider areas by affecting Indonesia, Hong Kong and Taiwan and in late December 1997 it spread to Japan and South Korea. Later the crisis affected the stock markets of US and Europe by causing them to fall and even having an impact on emerging markets like Brazil and Russia which turned into a global financial crisis. Thus, the exports of Thailand during these two years, 1997 and 1998 respectively, leveled off and continued to hinder the exports of Thailand which eventually recovered in 1999 after suffering badly and finally began to rise in 2000. Shockingly on September 11, 2001 the terrorist attack on the World Trade Centre had a great impact on the exports of Thailand, since according to Economy Watch (2010) the US was the largest export partner of Thailand during that period until China replaced the US as Thailand's top export destination in 2011 (Fernquest, 2011). This devastating situation again hampered the growth of the exports of Thailand.

Since 2002, the exports of Thailand have grown consistently until the beginning of 2008, just before being devastated by the 2007 – 2008 global financial crises which was caused by the subprime mortgage crisis in the United States in August 2007. Right after the aftermath, the market recovered and the exports of Thailand also recovered from a catastrophic failure of the markets and grew strong until the beginning of 2011. However, during 2011 the economy of Thailand was affected by two great natural disasters which totally devastated the market and the exports of Thailand. On 11th March 2011, Japan was hit by Tsunami which was caused by an earthquake in the Pacific Ocean and Thailand was submerged from July 2011 until the beginning of 2012. However, right after the aftermath, the economy of Thailand recovered very fast, yet, in November 2013 Thailand had to face a Political crisis which was triggered by the proposing of an amnesty bill which was rejected by the Democrat Party. This ongoing 2013 – 2014 Political crisis greatly affected the Thai economy and the exports of Thailand have slowed the growth of economy of Thailand as a whole (<http://www.tradingeconomics.com/thailand/exports> accessed the data on 4/6/2014 at 1:25 pm).

Table 1.1: Top Ten Thai Export Products (Period: January – May 2011, Value: Million Baht)

Serial Number	Export Products	Period: January – May 2011
		Value: Million Baht
1	Computer and Accessories	223,882.80
2	Auto parts and Accessories	215,535.80
3	Gems and Jewelry	167,162.90
4	Rubber	165,245.60
5	Plastic	110,972.90
6	Chemical Products	102,657.00
7	Electronic Circuit	100,445.10
8	Rubber Products	98,162.50
9	Refine Fuel	95,989.60
10	Rice	86,830.40

Source: Thai Export Product.

<http://www.thaiexportproduct.com/top10thaiexportproducts.php> accessed the data on 4/6/2014 at 2:00 pm.

Table 1.1 shows the top ten export products of Thailand to the different parts of the world. According to the Thai Export Products (2011) during the period of January till May 2011, computer and accessory products were the products that were at the top of the list followed by auto parts and accessories, gems and jewelry by exporting 223,882.80 million baht, 215,535.80 million baht and 167,162.90 million baht respectively. This shows that these products play a crucial role in the economy of Thailand. Products like rubber, plastic, chemical products and electric circuits are the products that also have a significant place in

the economy of Thailand by exporting 165,245.60 million baht, 110,972.90 million baht, 102,657.00 million baht and 100,445.10 million baht respectively. Despite less importance, products like rubber refined oil and rice are also a major contributors to the economy of Thailand by exporting 98,162.50 million baht, 95,989.60 million baht and 86,830.40 million baht respectively. The exporting of these products varies from country to country. Each product has its own destination according to demand (See Appendix A for the list of the main destination of each product). Summed up altogether, Thailand has close partners to export all its products manufactured in Thailand, likewise for importing products also (See Appendix B for the list of main export and import countries of Thailand) (<http://www.thaiexportproduct.com/top10thaiexportproducts.php> accessed the data on 4/6/2014 at 2:00 pm).

Therefore, the technology products are the main product that Thailand has been exporting for many years in modern generation (See Table 1.1), the profitability of technology companies of Thailand has an important role in the growth of the economy of Thailand. Furthermore, Figure 1.1, Figure 1.2 and Figure 1.3 show that many numerous micro and macro environmental factors play an important role in the economy both globally and domestically. Therefore, studying the impact of the micro and macro environment towards profitability of technology companies in Thailand has become an important issue for the benefit of the economy of Thailand and for society as a whole.

1.2 Research Objectives

The purpose of this study is to explore how technology companies in Thailand generate profits in different environments, such as the micro and macro environment which are very critical in nature for every sector of business. Furthermore, this research attempts to find out whether the micro and macro environment has a strong positive or strong negative impact, weak positive or weak negative impact or no significant impact on profitability of technology companies of Thailand. Keeping that in mind, the research identifies the independent variables in the study under the micro environment in terms of assets, capital, debt (loan) and liquidity and macro environment in terms of gross domestic products (GDP) and the inflation rate (INF) which have a significant impact on profitability in terms of return on asset (ROA) and return on equity (ROE). Therefore, in order to achieve all the above stated objectives, the researcher has set the following research objectives for this study:

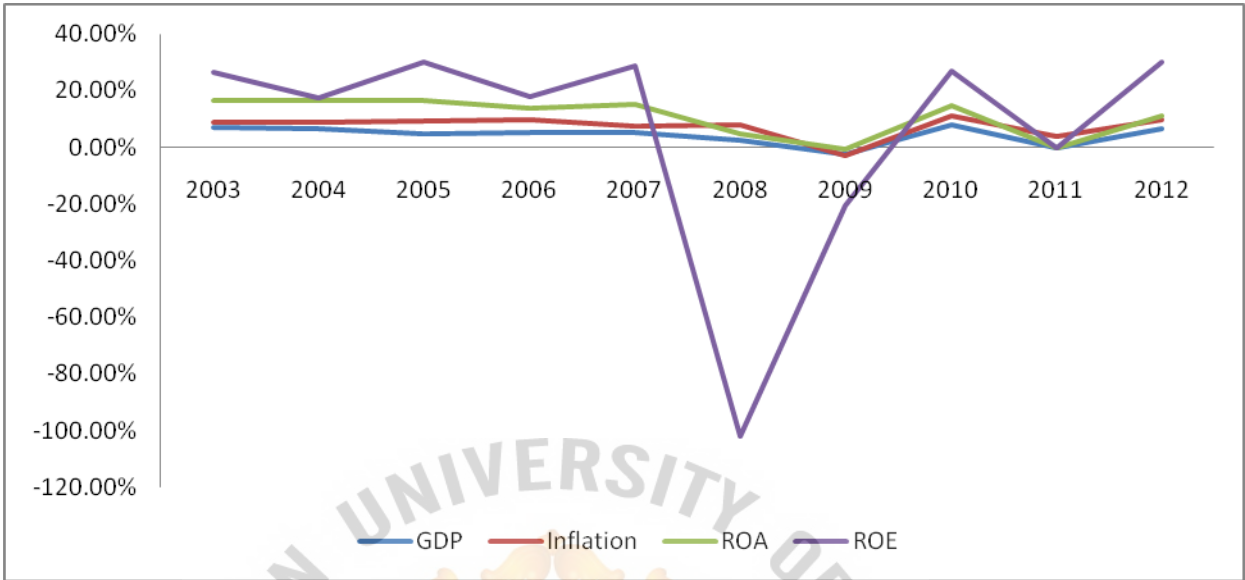
1. To examine the significant impact of micro environmental factors in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on asset (ROA).
2. To examine the significant impact of macro environmental factors in terms of gross domestic products (GDP) and the inflation rate (INF) on profitability in terms of return on asset (ROA).
3. To examine the significant impact of micro environmental factors in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on equity (ROE).
4. To examine the significant impact of macro environmental factors in terms of gross domestic products (GDP) and inflation rate (INF) on profitability in terms of return on equity (ROE).

1.3 Statement of the Problem

Before the 1997 economic crisis, Thailand was a fast-rising economy and saw miraculous economic growth and development. Undeniably, the 1997 economic crisis was one of the most severe times for the affected the country and it left behind many lessons and implications for generations to come (Decharuk *et al.*, 2009). According to Figure 1.3, the economy of Thailand was impacted by various desolations. During late 2008, the economy of Thailand was affected by the 2007–2008 global financial crises. Furthermore, during 2011, the economy of Thailand was badly affected by the Japanese Tsunami and the great flood of Thailand. Recently, Thailand had to face political crisis. All these problems have a great impact on Thailand's economy.

However, in December 2011, the government of Thailand released its Royal Decree to reduce the corporate income tax rate from 30% to 23%. Further, to reduce the rate to 20% in 2013 and 2014. This interesting development was able to push back the economy from its devastations. Therefore, Thailand's economic conditions have undergone a structural change over the past few decades (<http://www.taxand.com/taxands-take/news/reduction-corporate-tax-rate-%E2%80%93-what-it-means-businesses> accessed the data on 6/9/2014 at 11:58 am).

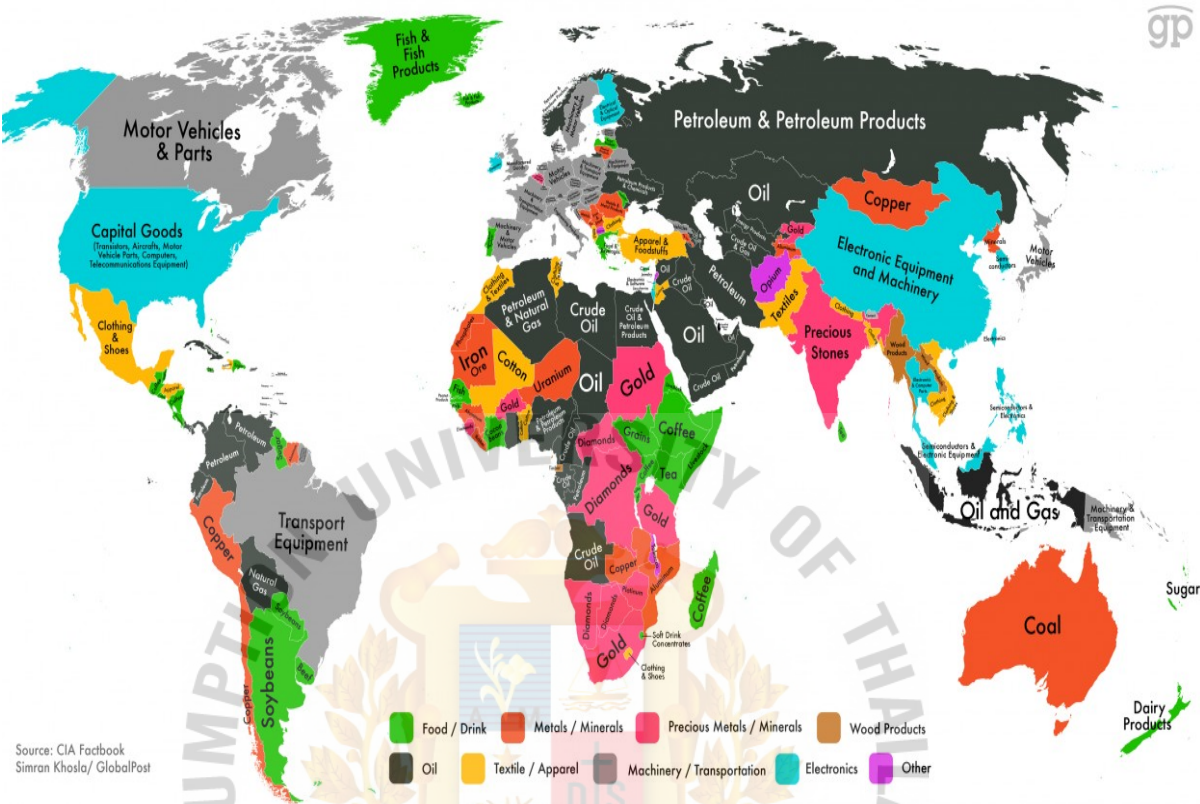
Figure 1.4: Average Profitability of Technology Industry compared to GDP and Inflation of Thailand from 2003 to 2012



Source: Computed by the author from the financial statement of the companies

According to Figure 1.4, return on equity was positively fluctuating from 2003 to 2004. However, during the 2007 – 2008 global financial crises, GDP, Inflation and ROA decreased slightly, while, most shockingly the ROE of technology companies plunged - 106%. Furthermore, ROE dropped dramatically during 2011, while, GDP, Inflation and ROA all dropped simultaneously. Therefore, an extremely declining ROE brought a new picture into the market about technology companies in Thailand. Further, this brought a concern for investors who were intending to invest or invested in technology companies of Thailand.

Figure 1.5: Highest Export Value of the World



Source: Global Post
<http://www.globalpost.com/dispatch/news/business/global-economy/140502/world-commodities-exports-map> accessed the data on 6/9/2014 at 12:52 pm.

According to Figure 1.5, the highest exports from Thailand were electronic products and computer parts, which can be seen in blue in the Figure 1.5. According to the Figure 1.5, countries highlighted with green export food and drink, counties with red export metals and minerals, countries with pink export precious metals and minerals, countries with brown export wood products, countries with black export oil, countries with orange export textile and apparel, countries with grey export machinery and transportation, countries with blue export electronics and countries with violet export other products.

In summary, during 2003 – 2012, the economy of Thailand faced many different apocalypses, which devastated the economy of Thailand and left the economy very weak. Therefore, the profitability of technology companies was badly affected and reduced during this decade. However, right after the aftermath, the reduction of income tax rates played a major role in recovering the economy. Thus, these situations have changed the business scenario. Since, electronic products and computer parts have become the main exports from Thailand, and this sector has shown an importance to the economy of Thailand. Thus, the researcher of this study was interested in studying the impact the of micro and macro environment affecting the profitability of technology companies of Thailand.

Additionally, the researcher has collected data from secondary sources only. Therefore, there might be an error in data collection. The data was collected from secondary sources such as Bloomberg and Morningstar and obtained from annual reports containing annual balance sheets and annual income statements, thus there could be errors while obtaining data from the annual reports.

Further, Damodaran (2007) explains that the return on assets (ROA) cannot be compared to the cost of capital, since the cost is based on the cost of debt and equity invested in assets. Furthermore, Lesakova (2007) explains that return on equity is prone to timing problems, risk problems and value problems. In timing problem, return on equity (ROE) includes earnings for only one year and fails to capture the full impact of long term decisions. In risk problems, return on equity (ROE) does not measure what risk a company has taken to generate the return on equity (ROE) because return on equity (ROE) looks only at return. In value problems, return on equity (ROE) uses the book value of shareholders' equity for the investment figure, not the market value which measures the current value while book value is only a historical value.

However, based on the conceptual framework, the presence of micro and macro environment factors would mean that there is a favorable impact on the profitability of technology companies. Hence, the questions to be addressed are as follows:

1. Is there a significant impact of the micro environmental factors in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on asset (ROA)?
2. Is there a significant impact of the macro environmental factors in terms of gross domestic products (GDP) and inflation rate (INF) on profitability in terms of return on asset (ROA)?
3. Is there a significant impact of the micro environmental factors in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on equity (ROE)?
4. Is there a significant impact of the macro environmental factors in terms of gross domestic products (GDP) and inflation rate (INF) on profitability in terms of return on equity (ROE)?

1.4 Scope of Research

The researcher intends a study whether there are significant impacts of the micro and macro environment on profitability. In this study the researcher focuses on studying the impact of the independent variables which are the micro environment in terms of assets, capital, debt (loan) and liquidity and macro environment in terms of gross domestic products (GDP) and inflation rate (INF) on the dependent variable which is profitability measured as return on asset (ROA) and return on equity (ROE). The target population of the study is technology companies of Thailand which are listed on the Stock Exchange of Thailand (SET). Apparently, in the Stock of Exchange of Thailand there are thirty nine technology companies which are listed on the stock market. The technology sector is made up of two sector divisions namely electronic component companies and information and communication technology companies. In total, there are thirty nine companies on the Stock Exchange of Thailand (SET) which consists of eleven electronic component companies and twenty eight information and communication technology companies.

In this study, the independent variable comprises the variables which arise following the impact of internal factors on companies' profitability which are grouped together as one variable called the micro environment and the variables which impact from external factors on companies' profitability which are grouped as the macro environment. In the micro environment, the representing variables are Assets, Capital, Debt (Loan) and Liquidity and the macro environment is represented by the variables gross domestic products (GDP) and inflation rate (INF). The dependent variable of this study consists of two variables that are return on assets (ROA) and return on equity (ROE) which are grouped as profitability. Last but not the least, in order to analyze this study the researcher will be using a multiple linear regression model.

1.5 Limitations of the Research

This study gives a detailed view of the impact of the micro and macro environmental factors on the profitability of technology companies in Thailand; however there are few limitations of the study relating to the target population, choice of independent variables and time frame. Therefore, the researcher assumes that these limitations of the study might influence the final outcome.

Firstly in this study, the researcher has selected both the electronic components and information and communication technology industries. Both these industries belong to the technology industry and due to the time constraint, the researcher could choose only thirty technology companies for the study. In the technology sector there are thirty nine companies all together, however, the researcher could not consider all thirty nine companies to analyze this study. The unavailability of data from all the companies compels the researcher to choose the companies whose data are readily available to the researcher. Therefore, the researcher could not study all thirty companies and had to select those companies' whose data are was available to the researcher.

Secondly, in the present study, researcher has selected only secondary data in order to analyze the profitability of the companies which are totally dependent on sources like annual reports of the companies. In this study, the researcher totally ignored other factors which could be done by primary sources such as goodwill, brand loyalty and so on and so forth, which also helps companies to attain profitability. However, these types of variables are qualitative in nature, which is inconvenient for the researcher to calculate the real value. Therefore, in this study the researcher could not study all the variables that have an impact on

the profitability. Thus, the researcher has selected the variables only on the basis of availability of sources like financial data of the companies.

Thirdly, limitation of time is the major problem for the researcher in this study. Some of the major problems that the researcher encountered during this study would be the availability of data that are not easily accessible as planned by the researcher. Therefore, the researcher has to select the period of studies cautiously.

1.6 Significance of the Study

In this study, the researcher intends to explain the impact of the micro and macro environment on profitability of the firms. Additionally, it also exhibits how well the companies are managing the assets in order get the satisfactory returns on all assets it employed, the equity funds invested in the firm and how effective management is from a stockholders' point of view. Therefore, the researcher expects that the finding of this study would provide benefits to the companies' management, investors, researchers or scholars, financial institutions, public corporations and auditing and consultancy firms, both conceptually and in actual practice.

- a) The technology companies in Thailand could use this study in order to manage their assets and equity funds to improve the profitability of the company. Perhaps, the companies of similar characteristics even from outside Thailand and the Stock Exchange of Thailand could also use this study.
- b) The investors who have already invested and prospective investors in technology sector of Thailand could use this study in order to judge the performance of the companies, such as how well the companies are managing the equity funds that are invested by investors, how much investors should get from the investment as return and how external factors and internal factors are affecting the profitability of the companies. Thus, investors could judge and make decisions whether to invest or not.
- c) The researchers or scholars who are interested to study the profitability of a firm and for further research can use this study for further studies and research by using different industries and variables, time and periods of collection of the data, different models for evaluation and from different locations.

- d) Financial institutions, whether public or private, can use this study. Financial institution can judge the companies' debt and its profitability and could make decisions on lending the funds or loans to the companies.
- e) Public corporations like planning boards, custom offices and taxation departments could also use the findings of this study. Public corporations could judge the way inflation is affecting the companies and countries economics as a whole and then could make decisions and plan for the improvements in the future.
- f) Further, organizations or firms, like auditing and consultancies could also use this study for the better judgment about the technology companies.

1.7 Definition of Terms

Assets: In this study, assets are the resource that belongs to the companies. These resources include current assets and fixed assets, which are held by the companies for their operations. Therefore, an International Accounting Standard Committee (2001) defined assets as a resource controlled by an enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise.

Capital: In this study, capitals are the funds that technology companies held to operate their daily businesses. This capital includes short term debts or funds and long term funds. Long term fund include long term debts and equity capital of the companies. Therefore, Sweeney (1933) defined capital as an economic good, hence one that promises to satisfy human desires by producing services or benefits in the future and then goes on to show fully why the appropriable supply of good is normally too limited to satisfy all the human demands for it.

Debt (Loan): In this study, debts are the companies' liabilities that the companies borrowed from financial institutions to increase the total capital of the company. Therefore, Ross *et al.*, (1999) defined a loan as an agreement that is a liability of the firm and an obligation to repay a specified amount at a particular time.

Gross Domestic Products: In this study, Gross domestic products are the monetary value of all the finished goods or services that are produced in Thailand. Therefore, Leamer (2009) define Gross domestic product as the market value of goods and services produced within a selected geographic area (usually a country) in a selected interval in time (often a year).

Inflation Rate: In this study, inflation rate is the rise of the average price level of all the goods and services in Thailand. Therefore, Sullivan *et al.*, (2003) defined inflation as an increase in the average price paid for goods and services bringing about a reduction in the purchase of the monetary unit.

Liquidity: Economically, Nikolaou (2009) has defined liquidity as the ability of an economic agent to exchange his or her existing wealth for goods and services or for other assets. Thus, in this study, liquidity is the ability of the companies to use its funds efficiently to operate their daily businesses, which they obtained from financial institutions. Generally, liquidity refers to the speed and ease with which an asset can be converted to cash (Ross *et al.*, 1998).

Macro environment: In this study, the micro environment is the forces that affect the companies from beyond the control of the firm. Therefore, Kotler and Armstrong (2001) define the micro environment as the larger societal forces that affect the micro environment.

Micro environment: In this study, the macro environment is the forces that affect the companies from neighboring factors, which influence the company's ability to serve its customers. Therefore, Kotler and Armstrong (1994) defined the micro environment as the forces close to the company that effect its ability to serve its customers.

Profitability: In this study, profitability is the ability to make profits by the companies from its business activities. Therefore, Thompson and Martin (2005) defined profitability as the financial ratios which look at profits generated in relation to the capital that has been employed to generate them.

Return on assets: In this study, return on assets is the percentage of how much the companies are earning by using its full assets. Therefore, Scott *et al.* (1999) define return on assets as the amount of net income produced by the firm's assets relating to net income to total assets.

Return on equity: In this study, return on equity is a percentage of how much the company generates from its shareholder's equity. Therefore, Arnold (2005) defined return on equity as the profit attributable to shareholders as a percentage of equity shareholders' funds.

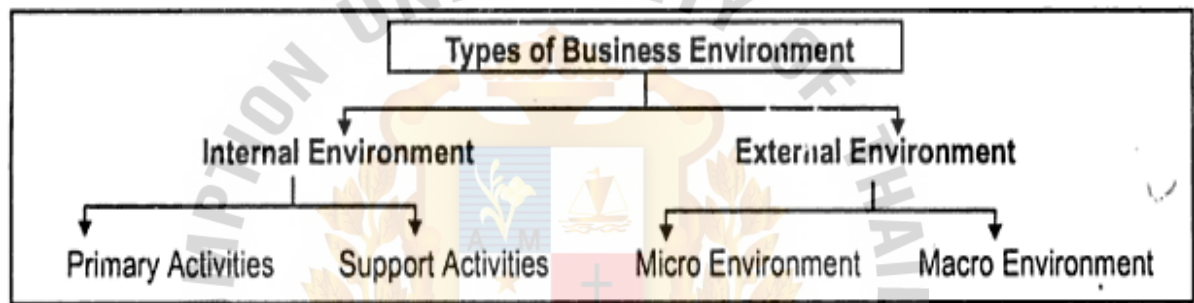


CHAPTER 2

LITERATURE REVIEW

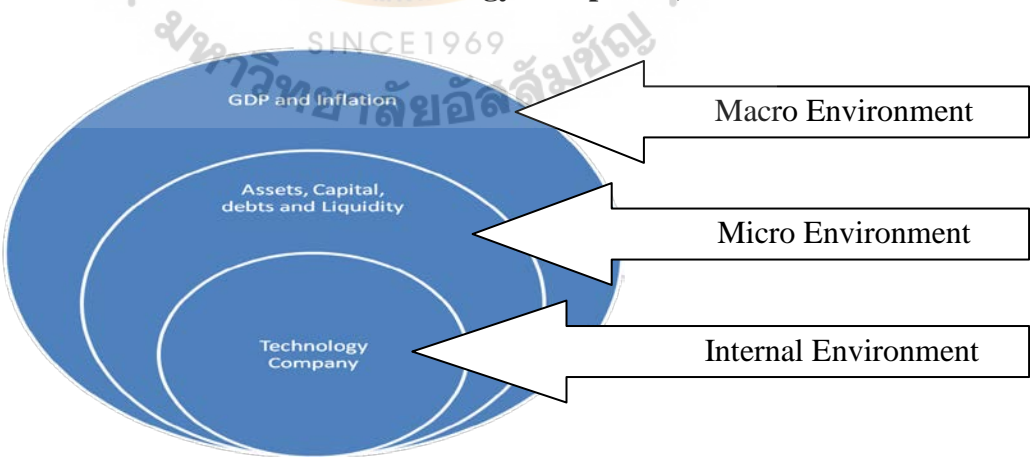
Environmental factors or constraints largely, if not totally, external and beyond the control of individual industrial enterprises and their managements. These are essentially the ‘givers’ within which firms and their management must operate in a specific country and they vary, often greatly, from country to country (Richman and Copen, 1972). The term business environment is generally used to describe the external environment of business, but a management faces two types of environments simultaneously, that is, external and internal environments (Goyal and Goyal, 2008).

Figure 2.1: Types of Business Environment



Source: Goyal A. and Goyal M. (2008). Business Environment: V. K. (India) Enterprise, V. K.Publications, New Delhi.

Figure 2.2: Business Environment of Technology Companies, Thailand



Source: Created by the author from Sage Publications. http://www.sagepub.com/upm-data/58888_blythe_pandp_chapter_2_the_marketing_environment.pdf accessed the data on 7/9/214 at 9:40 am.

According to Figure 2.1, the micro environment is a part of the external environment and yet, according to Figure 2.2, the micro environment is the environment that influences the performance of the technology companies from the close related factors. This environment can be influenced and controlled by the firm (Goyal and Goyal, 2008). Further, this environment usually do not affect all firms in all industries, rather it affects mostly one company. Therefore, in this study, the micro environments are assets, capital, debts (loan) and liquidity.

According to Figure 2.1, the macro environment is a part of the external environment. Further, according to Figure 2.2, the macro environment is the environment that influences the companies from outside the business. This environment cannot be controlled or influenced and thus, can impact positively or negative on the growth of the business. This environment mostly affects all the firms in an industry. Therefore, in this study, macro environments are gross domestic product (GDP) and inflation.

In this chapter, the researcher presents a literature review and discusses the researches related to this study that support the theoretical framework, discussed in chapter 3. The first section, the researcher will explain the theories, definitions and concepts related to the independent variables including assets, capital, debts (loan), liquidity, gross domestic product and inflation and the dependent variables measured as return on asset (ROA) and return on equity (ROE). In the second section, the researcher will discuss the related studies including theories covering the profitability in terms of return on assets (ROA) and return on equity (ROE). In the third and last section, the researcher will discuss the previous studies related to this study.

2.1 Theory: Definitions and Concepts of the Independent Variable

2.1.1 Assets

Harrison (2006) defined an asset as an entity from which an owner can derive a benefit or series of benefits in future accounting periods by holding or using the entity over a period of time, or from which the economic owner has derived a benefit in past periods and is still receiving a benefit in the current period. Harrison (2006) further explained that an asset can be regarded as a store of value because it represents a stock of future benefits. Juneja *et al.* (2001) defined an asset as anything of use to future operations of the enterprise and

belonging to the enterprise. In addition to above definitions, Peterson (2002) defined an asset in a broader sense that an asset is anything that will probably bring future economic benefit.

According to Peterson (2002) assets are classified into two categories: tangible and intangible. Tangible assets are those that one can touch, hold, or feel. Intangible assets are primarily financing items such as stocks, bonds and mortgages. However, according to Pandey (2004) assets are classified into three categories: tangible real assets, intangible real assets and financial assets, where tangible assets are physical assets that included plant, machinery, office, factory, furniture and buildings. Intangible assets include technical know-how, technological collaborations, patents and copyrights. Financial assets are financial papers or instrument such as shares and bonds or debentures, which are also called securities.

The definition of assets identifies the following three essential characteristics (Peterson, 2002):

- a) It embodies a probable future benefit that involves a capacity, singly or in combination with other assets, to combine directly or indirectly to future net cash flows.
- b) A particular entity can obtain the benefit and control others' access to it.
- c) The transaction or other event giving rise to the entity's right to control the benefit that has already occurred.

2.1.2 Capital

The use of the word capital comes from the idea that the owner furnished the business with resources, or capital, equal to the amount of the equity (Larson and Miller, 1980). Capital is an excess of assets over liabilities (Juneja *et al.*, 2001). It is also defined as owner's equity in a company respectively (Man, 2001). Capital is also defined by Lassalle (1921) as the instruments of labor or hoarded of labor while Mueller and Siberon (2004) also defined capital as the amount of capital that companies set aside as a buffer against potential losses from their business activities. Further, capital consists of products which are continually applied to further production (Lassalle, 1921).

Money acts as capital only when it is used to generate more money or more precisely, when it is employed in the production of surplus value (Fine and Saad-Filho, 2004). Thus, Man (2001) further clarified that capital is related to invested capital, retained earnings,

revenue, expenses and owner's withdrawals. Invested capital is owner's cash investments, retained earnings is accumulated undistributed profits up to the beginning of the current accounting period, revenue is income from sales of goods and services in the current accounting period, expenses are expenditures of the company in the current accounting period and owner's withdrawals are money withdrawn by the owners in the current accounting period.

2.1.3 Debt (Loan)

The common source of funds is bank loans (Rachman *et al.*, 1993). Debt is a firm's total liabilities (Ebert and Griffin, 1998) where a liability of a business is anything owed to creditors, that is, the claims of the firm's creditors (Boone and Kurtz, 1999). Debt funds are obtained by borrowing (Rachman *et al.*, 1993). More clearly, debt must be repaid at specific dates where a company must pay interest on debt and interest payments must be met regardless of operating results. Creditors can impose limits on management if interest payments are not received because lenders are creditors, not owners but lenders have prior claims on assets (Mescon *et al.*, 2002).

Bank loans are another common source of debt and can be long-term or short-term and secured or unsecured loans. Rachman *et al.*, (1993) defined long-term loans as the debt that must be repaid over a period of more than a year and May *et al.*, (1995) defined short-term loans as the loans that are designed to help a business with short-term needs to finance assets such as accounts receivable and inventory. Mescon *et al.*, (2002) defined secured loans as those backed up with something of value that the lender can claim in case of default, such as a piece of property and unsecured loans are loans requiring no collateral but a good credit rating.

2.1.4 Liquidity

The term liquidity refers to the expected length of time needed to convert an asset into cash (May *et al.*, 1995). According to Chandra (2008), a firm's liquidity refers to its ability to meet its obligations in the short run which is usually a period of one year. A company that cannot make cash payments to its creditors on a particular time is illiquid, therefore the term liquidity refers to a company's ability to make cash payments to its creditors at a particular point of time or on recurring basis (Siad, 2007). According to Shim and Siegel (2000)

accounting liquidity is the company's capacity to liquidate maturing short-term debt (within one year). In brief, liquidity is an ability to pay obligations that are expected to become due within the next year or operating cycle (Kimmel *et al.*, 2005).

A low liquidity level may lead to an increase in financial costs and result in the incapacity to pay its obligations (Manes and Zietlow, 2005). Therefore, current assets should be managed efficiently for safeguarding the firm against the risk of illiquidity. Thus, current assets management that affects a firm's liquidity is another important finance function (Pandey, 2004).

2.1.5 Gross Domestic Product

Gross domestic product is the featured measure of the economy's output (Gutierrez *et al.*, 2007). According to Hill (2009), gross domestic product (GDP) is the market of a country's output attributable to factors of production located in the country's territory. Thus, gross domestic product is a measure of market value of goods and services produced in a country (Griffin, 2005). More clearly and precisely, Parker (1998) explained that gross domestic product measures all finished goods and services produced within the nation, including those of foreign producers and further explains that gross domestic product does not include what domestic firms produce elsewhere.

Furthermore, gross domestic product reflects economic activity (Parker, 1998) and Callen (2008) discussed that gross domestic product is composed of goods and services produced for sale in the market and also includes some non-market production, such as defense or education services provided by the government. However, gross domestic product is not a measure of the overall standard of living or well being of a country (Callen, 2008). Therefore, Leamer (2009) explained that gross domestic product is about outcomes rather than processes.

2.1.6 Inflation Rate

Inflation can be defined as a sustained or continuous rise in the general price level (Labonte, 2011). According to Willis (1920), inflation is that condition in which prices are, for non-commodity reasons, raised to a level which is regarded as abnormal or excessive. In addition, Kemmerer (1918) stated that it is the idea of a redundancy of money or circulating credit or both, thus a redundancy that results in rising prices. In general, inflation is the rise in

the prices of goods and services (Labonte, 2011). More specifically, inflation occurs when at a given price level a country's circulating media cash and deposit currency increase relatively to trade needs (Kemmerer, 1918).

More precisely, according to Labonte (2011) inflation has several things to be noted; firstly, inflation does not refer to changes in one price relative to other prices but refers to the movement in the general level of prices. Secondly, the prices are those of goods and services but are not assets. Lastly, the level of price must rise somewhat substantially and continue over a period for longer than a day, week or a month.

2.2 Theory: Definitions and Concepts of the Dependent Variable

2.2.1 Return on Asset (ROA)

The return on assets provides information about how much profits are generated on average by each unit of assets; therefore it is the indicator on how efficiently a company is being run (Petersen and Schoeman, 2008). According to Pinches (1990), return on assets provides an indication of the ability of the firm to earn a satisfactory return on all assets it employs. In short, return on assets is the ratio of net income to total assets (Brigham and Ehrhardt, 2002). According to Philippatos and Sihler (1991) return on assets is defined as:

$$\text{Return on Assets (ROA)} = \text{Net Income} / \text{Total Assets}$$

According to Chandra (2008), return on assets is an odd measure because its numerator measures the return to shareholders (equity and preference) whereas its denominator presents the contribution of all investors (Shareholders as well as lenders). However, Schall and Haley (1991) clarified that return on assets is the rate of return earned by the firm as a whole for all its investors including lenders.

2.2.2 Return on Equity (ROE)

The return on equity measures the profitability of equity funds invested in the firm (Chandra, 2008). According to Pinches (1990), return on equity provides an accounting-based indication of how effective management is from stockholders' point of view. Furthermore, Damodaran (2007) stated that the return on equity focuses on just the equity component of the investment. According to Philippatos and Sihler (1991) return on equity is defined as:

$$\text{Return on Equity (ROE)} = \text{Net Income} / \text{Owners' Equity}$$

Chandra (2008) claimed that return on equity is the most important measure of performance in an accounting sense because maximizing shareholder wealth is the dominant financial objective. However, Brigham and Ehrhardt (2002) claimed that return on equity does not consider risk while shareholders clearly care about returns; they also care about risk and return on equity which does not consider the amount of invested capital.

2.3 Related Literature Reviews

In this part of the study, the researcher reviews the related literature, and establishes the relationship between the various independent variables and dependent variables based on previous studies.

2.3.1 Relationship between Assets and Profitability

Assets have a significant role in determining the role and the profit ratio of a firm (Smith, 1980). However, Horne and Wachowicz (2004) claimed that there can be a negative effect on the profit of a firm and on the current assets of the firm. Gury et al., (1999) also found that there is a negative relationship on bank profitability and the liquid assets level which is held by the bank, however Bourke (1989) disagreed with this, who observed a positive and statistically significant relationship. Lamberson (1995) maintained that asset management of the firm is the most critical issue in the firm. By employing statistical cost accounting (SCA), Vasiliou (1996) suggested that asset management plays a prominent role in explaining inter-bank differences in profitability. Asiri (2007) applied statistical cost accounting (SCA) and found that assets are positively related on the profitability of Kuwaiti banks.

In the study of Paradogonas (2007) on the financial performance of large and small firms: evidence from Greece, the econometric results indicated that investing in fixed assets significantly affects a firm's profitability. In the study of Sayeed and Hogue (2009) on the impact of assets and liability management on profitability: a study on public versus private commercial banks of Bangladesh, the results showed that profitability of banks are directly affected by management of their assets and liabilities.

2.3.2 Relationship between Capital and Profitability

Heavy capital is one of the main factors of a companies' performance. Kosmidou *et al.*, (2005) found that there is a positive significant relationship between the equity ratio to total assets and net profit margin (NIM) because net profit margin shows the earnings left for shareholders (both equity and preference) as a percentage of sales which measures the overall efficiency of production, administration, selling, financing, pricing and tax management (Chandra, 2008). A more efficient company should have higher profits, thus, Havrylchyk and Jurzyk (2006) found that there is a positive and direct relationship between capital and profits of the bank. Therefore, Haron (1996) concluded from his study that capital adequacy, total expenses and liquidity show a statically significant effect on profitability.

In addition, Bourke (1989); Molyneux and Thornton (1992) and Goddard *et al.*, (2004) claimed that size is positively related to the capital ratio, and thus is positively related to profitability because Kosmidou *et al.*, (2005) found an inverse and statistically significant relationship with size and profitability. Demirguc-Kunt *et al.* (1998) also indentified a positive relationship between size and profitability in which they found that high funds can easily meet their rigid capitals so that they can have extra funds for giving loans to borrowers and thereby increase their profits and earning levels.

2.3.3 Relationship between Debt (Loan) and Profitability

Higher risky loans require higher loan loss provision and consequently a lower income generating ability of a company (Al-Omar and Al-Mutairi, 2008). Therefore, the effect of credit risk on profitability is negative (Molyneux and Thornton, 1992). Furthermore, Athanasoglou *et al.* (2005) found that credit risk is negatively and significantly related to profitability. On the contrary, Chaudhry *et al.*, (1995) found a positive relationship between loan to assets and bank profitability. Despite the contrary, Duca and McLaughlin (1990) concluded that the profitability variation is highly susceptible to the credit risk variation because the increased exposure to the credit risk is normally connected to the decrease of the firm's profitability.

A study conducted by Miller and Noulas (1997) found a negative relationship between credit risk and profitability. It shows that whenever there is a negative relationship between credit risk and profitability, it signifies that there is a risk linked with loans (Gul *et al.*, 2011). Thus, the study by Athanasoglou *et al.*, (2006) showed that size, credit risk and capitalization have significant impacts on profitability.

2.3.4 Relationship between Liquidity and Profitability

Maintaining adequate liquidity is much more than a corporate goal, which is a condition in which corporation cannot reach the continuity of a business (Vieira, 2010). Any ration below 1.0 may mean that the business may not be generating enough cash to meet the short term obligations (Morrel, 2007). However, Matarazzo (2003) explained that if an analyst is observing a company's balance sheet and notes a liquidity ratio of less than 1.0 he shall not, in principle; consider it to be unable to pay its debts on time. Therefore, Haron (1996) concluded from his study that liquidity shows a statistically significant effect on the profitability. Yet, higher liquidity leads to agency problems between owners and managers (Fama and Jensen, 1983) and supported this view point by suggesting that there is a negative relationship between liquidity and profitability (Eljelly, 2004; Raheman and Nasr, 2007; Molyneux and Thornton, 1992; Gury *et al.*, 1999).

According to Chandra (2008), normally a high liquidity is considered to be a sign of financial strength, however, to the contrary according to Neto (2003) a high liquidity can be as undesirable as a low liquidity level. Yet, Goddard *et al.*, (2005) claimed that because of liquidity, firms may be in a better position to capture growth opportunities and cope with unpredictable market changes. However, Clayes and Vennet (2008) have not agreed with the results by finding a positive and statistically significant relationship of net interest margin with liquidity. On the other hand, Nunes *et al.*, (2009) found a neutral relationship of liquidity with a firm's profitability.

2.3.5 Relationship between Gross Domestic Product (GDP) and Profitability

According to Demircug-kunt and Huizinga (1999), rapid economic growth can increase the profitability of a large number of countries, and is supported by Bikker and Hu (2002) who found a positive relationship between gross domestic product growth and profitability. In an integrated transport company's macro environment evaluation, Zvirblis (2007) stated that gross domestic product growth is also the most favorable macro environmental factor. However, Demircug-kunt and Huizinga (1999) and Naceur and Goaid (2005) found that this variable is insignificant but on the contrary, these results are not agreed to by Kosmidou *et al.*, (2005) who found a positive relationship between gross domestic product growth and performance.

The theory of Kosmidou *et al.*, (2005) still remains consistent with findings of Pasiouras and Kosmidou (2006); Pasiouras and Kosmidou (2007); Hasan and Bashir (2003), who supported the argument of the positive associations between the gross domestic product growth and financial performance of the sector (Ayadi and Boujelbene, 2012). However, Demircug-kunt *et al.*, (2003) does not agree with Kosmidou *et al.*, (2005) and stated that economic growth is weakly associated with a decrease in the margin, notwithstanding the evidence, the real gross domestic product growth rate was found to be significantly related to profitability (Hefferman and Fu, 2008).

2.3.6 Relationship between Inflation Rate and Profitability

Revell (1979) introduced the issue of the relationship between profitability and inflation. In the study of Dadgar and Keshavarz (2006); Komijani and Alavi (1999) investigated the relation between inflation and growth of the economy. However, Fortin (1996); Akerlof *et al.*, (1996) argued that reducing inflation too close to zero worsens economic performance because of downward nominal wage rigidity. In addition, in the study of Ayadi and Boujelbene (2012) it was noticed that the relationship between inflation and profitability is negative, claiming, inflation has brought an increase in costs higher than the revenues as a negative relationship between inflation and profit.

2.4 Previous Studies

Bongsebanshu-phubhakdi *et al.* (2009) studied the management of technology in Thai automotive parts companies. The main purpose of this study was to identify the key factors for management of the technology and human resources, where Thai domestic automotive parts companies have to manage their technology and human resources effectively and efficiently. In this study, the researcher used 295 samples from Thailand Automotive Directory 2005-2006 by using the Auto Parts Index at random. The researcher used two methods to collect the data, Questionnaire survey and Interview survey. In this study, questionnaires in Thai language were delivered by mail to 100 domestic and foreign (Japanese) companies from 10 April to 30 April 2006 and to 195 domestic and foreign (Japanese) companies from 18 December 2006 to 9 January 2007. The researcher interviewed two domestic companies and three foreign (Japanese) companies, in Bangkok and suburban industrial estates between 16 December 2006 and 09 January 2007. In order to investigate this study, the researcher used the Pearson correlation coefficient method, t-test and one-way analysis of variance. The results indicated that, Tier 1, Tier 2 and Tier 3 companies have significance differences in the number of proprietary and management technologies adopted. There are differences among the two groups in QM ranking and the number of proprietary and management technologies adopted. The growth rate of sales and average retention rates have a positively significant relationship. The numbers of proprietary technologies and management technologies adopted have a positively significant relationship. The numbers of both technologies and QM ranking have a positively significant relationship. The numbers of proprietary technologies adopted and in-house defect rates have a negatively significant relationship.

Pasiouras and Kosmidou (2006) studied the factors that influence the profitability of domestic and foreign commercial banks of the European Union where the main purpose of this study was to examine how a bank's specific characteristics and the overall banking environment affect the profitability of commercial domestic and foreign banks operating in the 15 EU countries over the period 1995 to 2001. In this study researcher used a balanced panel dataset of 584 commercial banks operating in the 15 European Union countries over the period 1995 to 2001 as a sample which consisted of 4088 observations. The researcher analyzed the data by using linear regression and Chi-Square. The results indicated that profitability of both domestic and foreign banks is affected by both the bank's specific

characteristics, financial market structure and macro-economic conditions. Furthermore, the researcher concluded that all the variables are significant except the concentration although there is a difference in impact and profitability by the variables for domestic and foreign banks.

Al-Omar and Al-Mutairi (2008) studied bank specific determinants of profitability in Kuwait. The main purpose of this study was to investigate the impact of bank specific determinants on bank's profitability in the Kuwait banking sector. The sample for this study is taken from an annual data from seven national commercial banks over a period from 1993 to 2005. In order to investigate this study, the researcher used seemingly unrelated regression (SUR) technique. After investigation, the researcher found that the loan assets ratio and operating expenses ratio are not statistically significant and statistically positively significant in terms of size variables. Therefore, the researcher explained that there is a need to improve the capital adequacy and reduce the ratio of non interest assets in order to improve profitability and further researcher explained that there is a possibility of higher profits as the size increases.

Qureshi and Yousuf (2014) studied determinants of profit heterogeneity at the firm level as evidence from Pakistan. The main purpose of this study is to determine and investigate the relative importance of different factors that results in profit heterogeneity at the firm level. The sample for this study is 337 firms that are listed on the Karachi Stock Exchange (KSE) for 22 years from 1987 to 2008. In this study the researcher used analysis of variance (ANOVA) random effect model in order to explain variations in the firm profitability and it develops different models in order to observe the impact of different independent variables on profit variation. In this study, results show that profitability has a strong relationship with the firm's specific variables which are size, liquidity, market share and age have a positive impact on profitability in all models, however in domestic sectors size and liquidity have a significant negative and insignificant positive relationship respectively. Further, it establishes an insignificant relationship of capital intensity and growth towards profitability. Last but not the least, researchers maintained both owners and managers of the firms operating in Pakistan should consider both, the capital structure and liquidity level, in order to achieve higher profitability as well as policy makers and banking sectors to ensure development of capital in the market instead of just helping to improve corporate profitability.

Bekeris (2012) studied the impact of macro-economic indicators upon small and medium-sized enterprise's profitability. The main purpose of this research was to evaluate the impact of macro-economic on the profitability of small and medium-sized enterprises. This study analyzed the influence of macro-economic indices on the profitability of a company. The researcher used the data from the department of statistics of Lithuania for a period of ten years from 2000 to 2010. In this study, the researcher used descriptive statistics along with Pearson's Correlation and 20th version of statistical package for the social sciences (SPSS). The researcher found that the inflation, average wages, the number of enterprises and the monetary base are not statistically significant and did not observe strong correlation with corporate profitability. However, interest rate changes and unemployment showed the greatest impact on profitability. Furthermore, the researcher explained correlation with employment is negative which means that an increase in unemployment reduces the profitability of firms.

Yazdanfar (2013) studied the profitability determinants among micro firms based on evidence from Swedish data. The main purpose of this study was to investigate the variables affecting the firm's profitability. The sample for this study was 87,000 observations by covering 12,530 non financial micro firms operating in four industry sectors from 2006 to 2007. So, in order to investigate the variables that are affecting a firm's profitability seemingly unrelated regression (SUR) was used by the researcher. In the results, the researcher found that variables like firm size, lagged profitability, growth and productivity positively influenced profitability while variables like firm age and industry affiliation negatively influenced profitability. Furthermore, the researcher found that larger and younger firms with high productivity and growth are more likely to be profitable and the firm's productivity is the strongest determinant of profitability.

Athanasoglou *et al.* (2005) studied bank specific, industry specific and macro-economic determinants of bank profitability. The main purpose of this study was the examination of how bank specific, industry specific and macro-economic determinants effect the bank's profitability. In this study the researcher studied the Greek banks from the period of 1985 to 2001 where variables like net profits before taxes, total assets, total shareholders' equity, loan loss provisions, the value of total loans, gross total revenue and operating

expenses are obtained from annual bank balance sheets and profit and loss accounts. Further, total numbers of bank employees were obtained from the data of the bank of Greece. The market shares are obtained by calculating the assets of the bank divided by the total assets of the sector and concentration is obtained by using the herfindahl-hirschman (H-H) index. Consumer price index (CPI) and gross domestic product (GDP) are obtained from the National Statistical Service of Greece and the 10-year government bond yield are from Eurostat. Finally, cyclical output is obtained on the basis of Hodrick-Prescott filter. In this study the researcher applied generalized method of moments (GMM) technique in order to study the bank of Greece's profitability. The results showed that all the bank's specific determinants affect the bank's profitability significantly except the size. In addition, the business cycle has a positive effect only in the upper phase of the cycle. Thus, researchers concluded that profitability of the Greek bank is shaped by bank specific and macro economic factors, however industry structure does not seem have a significant affect on profitability.

Tan and Floros (2012) studied the bank profitability and inflation in the case of China. The main purpose of this study was to evaluate the determinants of bank profitability in China and to examine the effects of inflation on bank's profitability. The sample for this study contained 197 in total and data were taken from annual figures of 101 Chinese banking sector companies which consisted of 5 state owned banks, 12 joint stock commercial banks and 84 city commercial banks from a period of 2003 to 2009. Then, in order to evaluate and examine this study the researcher applied generalized methods of moment (GMM) estimation. After evaluating and examining, the researchers observed that inflation and all the other variables have a positive relationship with profitability. Furthermore, researchers explained that higher volume of non-traditional activity and higher taxation are the main reasons for low profitability. Therefore, the researchers further maintained that policy actions have to be taken into consideration in order to improve the profitability.

Malik (2011) studied the determinants of insurance companies' profitability which is an analysis of the insurance sector of Pakistan. The main purpose of this study is to investigate the determinants of profitability among insurance companies in Pakistan which emphasized the effects of firm specific factors. The sample of this study included 35 listed life and non-life insurance companies from the period of 2005 to 2009 and data are obtained from secondary sources such as financial statements which include the balance sheet and

profit and loss accounts of insurance companies. To examine this study, the researcher applied descriptive analysis and multiple regression analysis. The results showed that there is no significant relationship between age of the company and profitability while there is a positive significant relationship between company size and volume of capital with profitability. In addition, there is a negative significant relationship between the loss ratio and leverage ratio with profitability. Hence, the researcher concluded that return on assets (ROA) is affected by size and volume of capital positively and negatively by leverage and loss ratio.

Charumathi (2012) studied the determinants of profitability of Indian life insurers. The main purpose of this study was to investigate the factors determining the profitability of life insurers operating in India. The sample included all the 23 Indian life insurers (1 public and 22 private insurers) from the period of 2008 to 2011 and the data are obtained from the Insurance Regulatory and Development Authority (IRDA) data base, public disclosures and annual reports of the respective companies. In order to study the profitability of Indian life insurers, the researcher used the multiple linear regression model. In the results, the researcher found that size and liquidity positively and significantly influenced the profitability and the leverage, premium growth and equity capital has negatively and significantly influenced the profitability while underwriting risk showed no evidence of the relationship between profitability. Hence, the researcher hints that expanding into untapped markets, unique regulation, entering into capital markets, tie ups with banks, foreign direct investment, providing long term savings and sustainable business models which would help the life insurers to improve their profitability.

Table: 2.4.1: Summary of Previous Studies

Researcher	Research Topic	Variables	Sample	Findings
Bongsebanshu-phubhakdi <i>et al.</i> , (2009)	Management of technology in Thai automotive parts companies.	<p>Dependent: Quality management ranking.</p> <p>Independent: Growth rate of sales.</p> <p>Independent: Growth rate in the number of employees, Average retention rate, Number of management technologies adopted, Number of proprietary technologies adopted and In-house defect rate.</p>	In this study, the researcher used 295 samples from Thailand Automotive Industry Directory 2005-2006.	<p>There are significant difference among Tier 1, Tier 2 and Tier 3 companies in the number of proprietary and management technologies adopted.</p> <p>There are difference among the two groups in QM ranking and the number of proprietary and management technologies adopted.</p> <p>The growth rate of sales and average retention rates have positively significant relationship.</p> <p>The numbers of proprietary technologies and management technologies adopted. The numbers of both technologies and QM ranking have positively significant relationship.</p> <p>The numbers of proprietary technologies adopted and in-house defect rates have negatively significant relationship.</p>

Researcher	Research Topic	Variables	Sample	Findings
Pasiouras and Kosmidou (2006)	Factors influencing the profitability of domestic and foreign commercial banks in the European Union	<p>Dependent: Return on average total assets (ROAA).</p> <p>Independent: Internal factors; Equity to total assets (EQAS), Cost to income ratio (COST), Loans to customer and short term funding (LOFUND), Total assets (SIZE). External factors; Annual inflation rate (INF), Real gross domestic product (GDP) growth (GDPGGR), Ratio total assets divided by gross domestic product (ASSGDP), Ratio stock market capitalization to total assets (MACPASS), Ration stock market capitalization to gross domestic product (MACGDP).</p>	In this study, the researchers used 4088 observations and 584 dataset of commercial banks operating in the 15 European Union countries over the period 1995 to 2001.	<p>Profitability of both domestic and foreign banks is affected by both the bank's specific characteristic, financial market structure and macro-economic conditions.</p> <p>All the variables are significant except the concentration.</p>

Researcher	Research Topic	Variables	Sample	Findings
Al-Omar and Al-Mutairi (2008)	Bank specific determinants of profitability: the case of Kuwait.	<p>Dependent: Return on assets (ROA).</p> <p>Independent: Equity to Assets ratio (K), Loan to Total assets ratio (CR), Operating cost to Total assets ratio (E), Non-interest assets to Total assets ratio (NIA), Log of Total assets (A).</p>	The researchers used the annual data from seven national commercial banks from 1993 to 2005.	<p>Loan assets ratio and operating expenses ratio are not statistically significant and statistically positive significant from the size variable.</p> <p>There is a possibility of higher profits as the size increases.</p>

Researcher	Research Topic	Variables	Sample	Findings
Qureshi and Yousuf (2014)	Determinants of profit heterogeneity at firm level: evidence from Pakistan.	<p>Dependent: Profitability (PRFT); Return on assets (ROA) = Net profit before tax / Total assets.</p> <p>Independent: Size (S) = Total assets, Growth (G) = Change in sales, Market share (M) = Firm sales / Industry sales, Capital intensity (K) = Depreciation / Total assets, Leverage (L) = Total debt / Total assets, Age (A) = Number of years since listing, Liquidity (Q) = Current ratio = Current assets / Current liabilities.</p>	The researchers studied 337 firms listed on Karachi Stock Exchange (KSE) for 22 years from 1987 to 2008.	<p>Profitability has a strong relationship with the firm specific variables which are size, liquidity, market share and age in all models.</p> <p>However, in domestic sectors, size and liquidity have a significant negative and insignificant positive relationship respectively.</p> <p>Further, there is an insignificant relationship between capital intensity and growth towards profitability.</p>

Researcher	Research Topic	Variables	Sample	Findings
Bekeris (2012)	The impact of macro-economic indicators upon small and medium-sized enterprise's profitability.	<p>Dependent: Profitability.</p> <p>Independent: Number of enterprises, Number of population, Gross domestic product, Exports, imports, Foreign direct investment, Unemployment, Taxes, Wages, Monetary base and Vilibor interbank interest rate.</p>	The researcher used the data of department of statistics of Lithuania from the period of 2000 to 2010.	<p>The inflation, average wages, the number of enterprises and the monetary base are not statistically significant and show no strong correlation with corporate profitability.</p> <p>Interest rate changes and unemployment showed the greatest impact on profitability.</p> <p>Employment showed a negative correlation with the profitability.</p>

Researcher	Research Topic	Variables	Sample	Findings
Yazdanfar (2013)	Profitability determinants among micro firms: evidence from Swedish data.	<p>Dependent: Return on assets (ROA) = Net profit after tax / Total assets.</p> <p>Independent: Firm size, Firm age, Firm growth, Lagged profitability, Productivity, Industry affiliation,</p>	In this study, the researcher studied 87,000 observations by covering 12,530 non financial micro firms which is operating in four industry sectors from 2006 to 2007.	<p>Firm size, lagged profitability, growth and productivity positively influenced profitability.</p> <p>Firm age and industry affiliation negatively influenced profitability.</p> <p>Larger and younger firms with high productivity and growth are more likely to be profitable.</p> <p>Productivity is the strongest determinant of profitability.</p>



Researcher	Research Topic	Variables	Sample	Findings
Athanasoglou <i>et al.</i> , (2005)	Bank specific, industry specific and macro-economic determinants of bank profitability.	<p>Dependent: Profitability; Return on assets (ROA) = Net profit before taxes / assets, Return on Equity (ROE) = Net profit before taxes / Equity.</p> <p>Independent: Bank specific; Capital (EA) = Equity / Assets, Credit Risk (PL) = Loan loss provision / Loans, Productivity growth (PR) = Rate of change in inflation -adjusted gross total revenue / Personnel, Operating expenses management (EXP) = Operating expenses / Assets, Size (S) = Real assets. Industry specific; Ownership (O) = Privately owned banks or market share (in terms of assets) of privately owned banks, Concentration (H-H) = Herfindahl-Hirschman index. Macro-economic; Inflation expectations (CPI) or IR = Consumer prices or 10-yr bond yield, Cyclical output (CO) = Trend calculated on the basis of Hodrick-Prescott (HP) filter.</p>	<p>The researcher studied the Greek banks from 1985 to 2001.</p> <p>Net profits before taxes, total assets, total shareholders' equity, loan loss provisions, the value of total loans, gross total revenue and operating expenses are obtained from annual bank balance sheets and profit and loss accounts.</p> <p>Total number of bank employees was obtained from the data of bank of Greece.</p> <p>Market shares are obtained by calculating assets of the bank divided by total assets of the sector.</p> <p>Concentration is obtained by using the herfindahl-hirschman (H-H) index.</p> <p>Consumer price index (CPI) and gross domestic product (GDP) are obtained from National Statistical Service of Greece.</p> <p>10-year government bond yield are obtained from Eurostat.</p> <p>Cyclical output is obtained on the basis of Hodrick-Prescott filter.</p>	<p>All the bank specific determinants affect bank's profitability significantly except the size.</p> <p>Business cycle has a positive effect only in the upper phase of the cycle.</p>

Researcher	Research Topic	Variables	Sample	Findings
Tan and Floros (2012)	Bank profitability and inflation: the case of China.	<p>Dependent: Return on assets (ROA) = Net income / Total assets, Net interest margin (NIM) = Net interest income / earning assets.</p> <p>Independent: Bank size (LTA) = Log of total assets, Credit risk (LLPTA) = Loan loss provision / Total loans, Liquidity (LA) = Loans / Assets, Taxation (TOPBT) = Tax / Operating profit before tax, Capitalization (ETA) = Shareholder's equity / Total assets, Cost efficiency (CE) = Overhead expenses / Total assets, Non-traditional activity (NTA) = Non-interest income / Gross revenues, Labor productivity (LP) = Gross revenue / Number of employees, Concentration (C) = Total assets of largest three or five banks / Total assets of whole banking industry, Banking sector development (BSD) = Bank assets / Gross domestic product (GDP), Stock market development (SMD) = Market capitalization of listed companies / Gross domestic product (GDP), Inflation (IR) = Annual inflation rate.</p>	The researchers used the data taken from annual figures of 101 Chinese banking sectors from 2003 to 2009 which contained 197 samples in total.	<p>Inflation and all the other variables have a positive relationship on profitability.</p> <p>Higher volume of non-traditional activity and higher taxation are the main reason for low profitability.</p>

Researcher	Research Topic	Variables	Sample	Findings
Malik (2011)	Determinants of insurance companies' profitability: an analysis of insurance sector of Pakistan.	<p>Dependent: Return on assets (ROA) = Net income to total assets.</p> <p>Independent: Company Age = Number of years to date of establishments, Size = Total assets in log in value, Leverage = Ratio of total debt to equity value of the company, Loss = Ratio of incurred claims to the earned premiums, Volume of capital (VOC) = Book value of equity.</p>	<p>The researcher studied 35 listed life and non-life insurance companies from 2005 to 2009.</p> <p>Data are obtained from secondary sources which are from the financial statements which include balance sheet and profit and loss account of insurance companies.</p>	<p>No significant relationship between ages of the company between profitability.</p> <p>Positive significant relationship of company size and volume of capital between profitability.</p> <p>Negative significant relationship of loss ratio and leverage ratio between profitability.</p>

Researcher	Research Topic	Variables	Sample	Findings
Charumathi (2012)	On the determinants of profitability of Indian life insurers: an empirical study.	<p>Dependent: Return on assets (ROA) = Net income before taxes / Total assets.</p> <p>Independent: Insurance Leverage (LEV) = Reserves / (Capital + Surplus), Size (LnNP) = Log of net premium (Total premium earned - Reinsurance ceded), Premium growth (PG) = Change in new premium (First year premium + Single premium), Liquidity (LIQ) = Current assets / Current liabilities, Underwriting risk (UWR) = Benefits paid / Net premium, Equity Capital (LnEC) = Log of equity capital.</p>	<p>The researcher studied 23 Indian life insurers from 2008 to 2011.</p> <p>Data are obtained from Insurance Regulatory and development Authority (IRDA) data base, public disclosure and annual reports of the respective companies.</p>	<p>Size and liquidity has positively and significantly influenced the profitability.</p> <p>Leverage, premium growth and equity capital has negatively and significantly influenced the profitability.</p> <p>Underwriting risk showed no evidence for the relationship between profitability.</p>

The relevant literature explains the impact that profitability has with micro factors such as assets, capital, debt and liquidity and with macro factors such as GDP and inflation. Researchers have used different methods to analyze their objectives as the data were not the same for every business firm, however, the researchers found similar methods from previous studies as the previous researchers used descriptive analysis and multiple regression analysis. The researchers also used many different variables to predict the profitability of the firm, and thus, in this study the researcher found the same variables that predicted the profitability of technology companies.

Thus, most of the previous studies have found similar results with the objectives of this study. The results are, micro factors, which are, assets, capital, debts and liquidity, and macro factors, which are, GDP and inflation, have a significant impact on the profitability of the firm.



CHAPTER 3

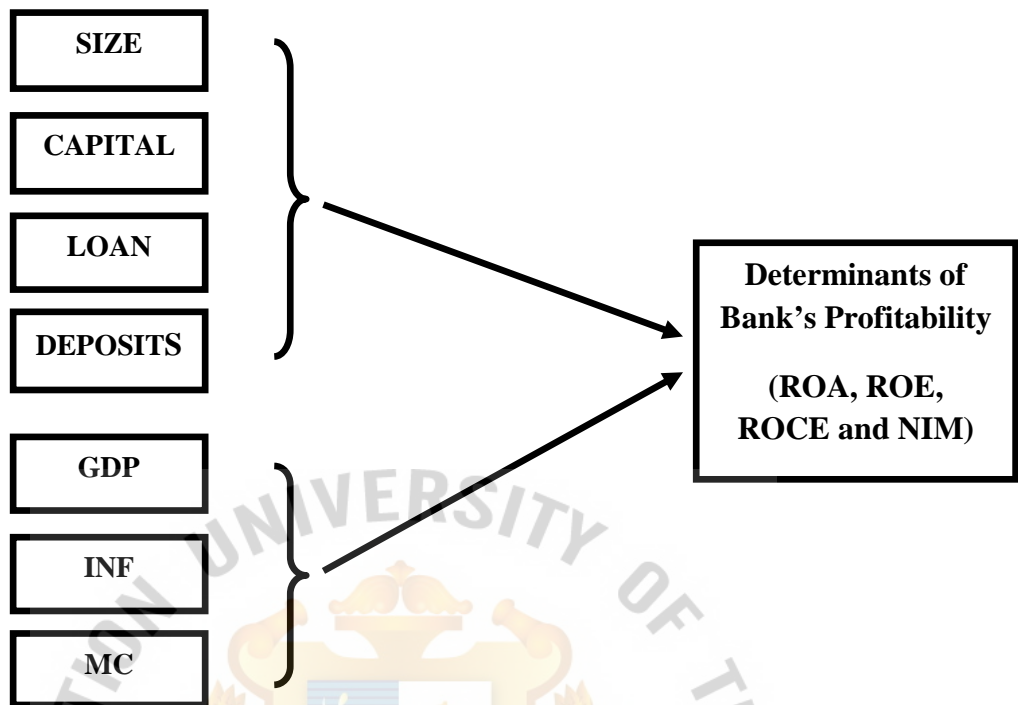
RESEARCH FRAMEWORK

This chapter is divided into four parts which consists of theoretical framework, conceptual framework, research hypothesis and operationalization of the variables. Firstly, the theoretical frameworks are very important for this study and would be discussed briefly. Secondly, the conceptual framework is developed showing the relationship between the independent variables and the dependent variables. Thirdly, the hypotheses show the relationship between the independent and dependent variables which are proposed to be tested later. Lastly, the operationalization of the variables are discussed.

3.1 Theoretical Framework

A theoretical framework is a collection of interrelated concepts, like a theory but not necessary so well worked-out. A theoretical framework guides the research, determining what things the researcher will measure, and what statistical relationships the researcher will look for (Borgatti, 1999). In this study, three previous researches are used to support the development of a new conceptual framework which showed the relationship between the variables. The first model was developed by Gul *et al.* (2011) who studied the factors affecting bank profitability in Pakistan. The second model was developed by Ayadi and Boujelbene (2012) investigating the determinants of the Profitability of Tunisian deposit banks. The last model was developed by Masood and Ashraf (2012) who studied the bank-specific and macroeconomic profitability determinants of Islamic banks. All the details of three models are discussed as follows:

Figure 3.1: Factors Affecting Bank Profitability

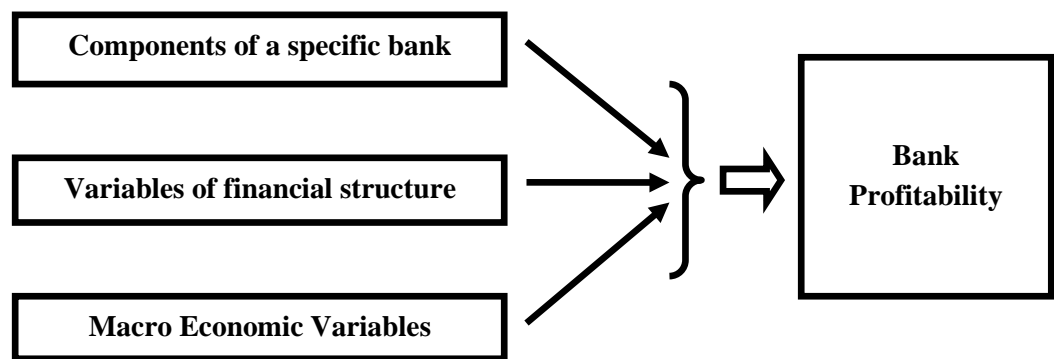


Note: GDP = Gross Domestic Product, INF = Inflation Rate, MC = Market Capitalization.

Source: Gul S., Irshad F. and Zaman K. (2011). Factors Affecting Bank Profitability in Pakistan: *The Roman Economic Journal*, 14(39), 61-87.

Gul *et al.*, (2011) studied the factors affecting the profitability of banks in Pakistan. In this study, the researcher examined the relationship between bank-specific and macroeconomic characteristics over bank profitability. The researcher used the data of the top fifteen commercial banks of Pakistan to study the factors that affect bank profitability in Pakistan. This study took data from 2005 to 2009 in order to get the best possible outcomes. In this study, the researcher used the pooled ordinary least square (POLS) method in order to investigate the impact of size, capital, loans, deposits, gross domestic product, inflation and market capitalization on major profitability such as return on assets (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM). The findings concluded that both internal and external factors have a strong influence on the profitability. The results of the study showed that both academics and policy makers are the main beneficiaries from this study.

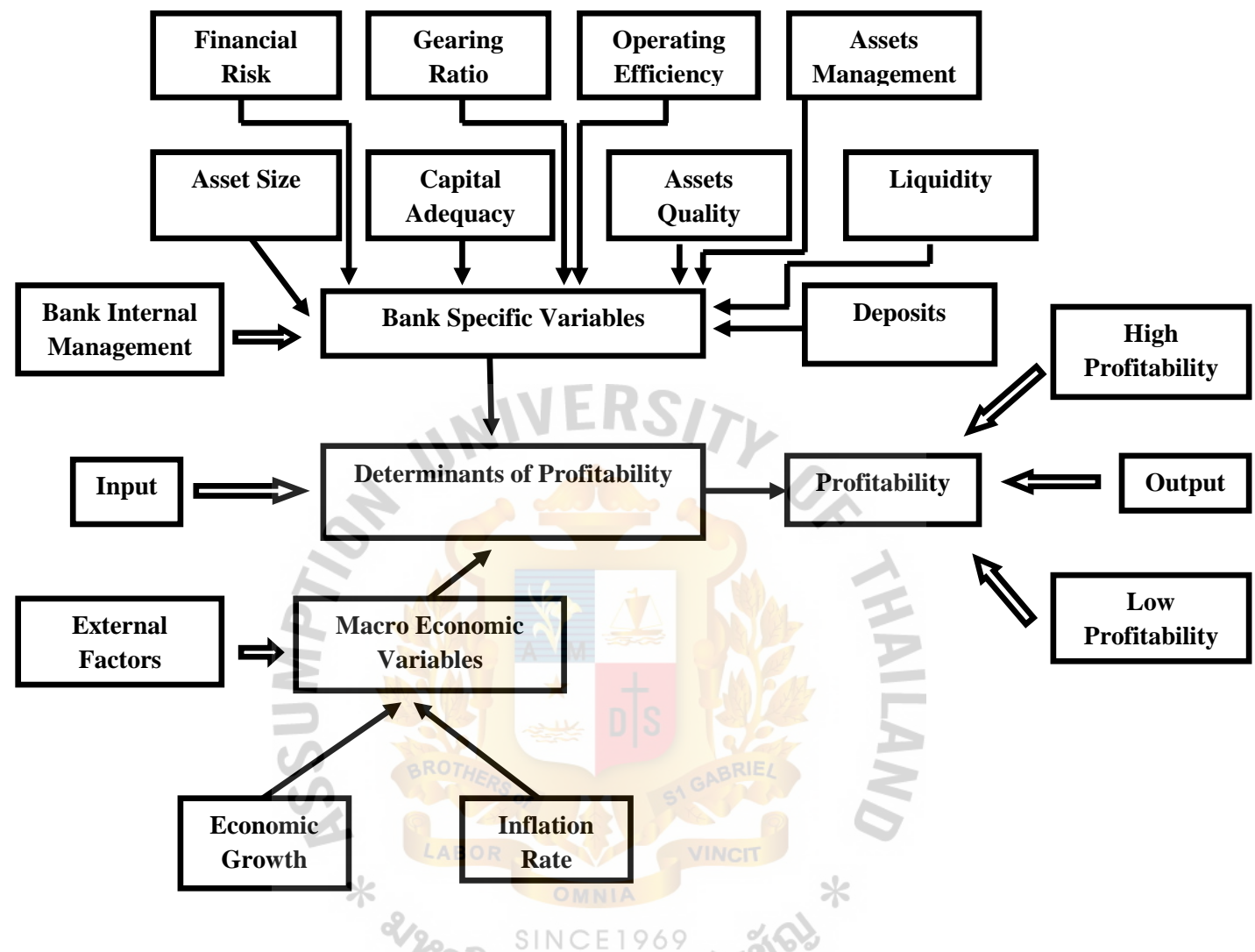
Figure 3.2: The Determinants of the Profitability



Sources: Ayadi N. and Boujelbene Y. (2012). The Determinants of the Profitability of the Tunisian Deposit Banks: *IBIMA Business Review*, 2012(2012), 1-21.

Ayadi and Boujelbene (2012) studied about the determinants of the profitability of the Tunisian deposit banks. In this study, the researcher studied twelve Tunisian deposit banks by using the data of eleven years from 1995 to 2005. The researcher used panel data to study the determinants of the bank profitability. The components of a specific bank included liquidity risk, credit risk, the strength of the capital (EQAS) and the size. Variables of financial structure included the concentration, total bank assets to GDP (ASSGDP) and market capitalization to bank assets (MACPASS). Macro Economic Variables included the growth rate of the GDP per real capital (GDPGGR) and the inflation rate (INF). The researcher concluded that capital and size are the most positively significant variables that effect the bank’s profitability while the bank’s assets to GDP and market capitalization to bank’s assets are the most negatively significant variables that effect the bank’s profitability. The researcher also concluded that there are no positively and negatively significant effects on bank’s profitability from macroeconomic indicators.

Figure 3.3: Bank-specific and Macro Economic Profitability Determinants



Source: Masood O. and Ashraf M. (2012). Bank-specific and Macro Economic Profitability Determinants of Islamic Banks: *Qualitative Research in Financial Markets*, 4(2/3), 255-268.

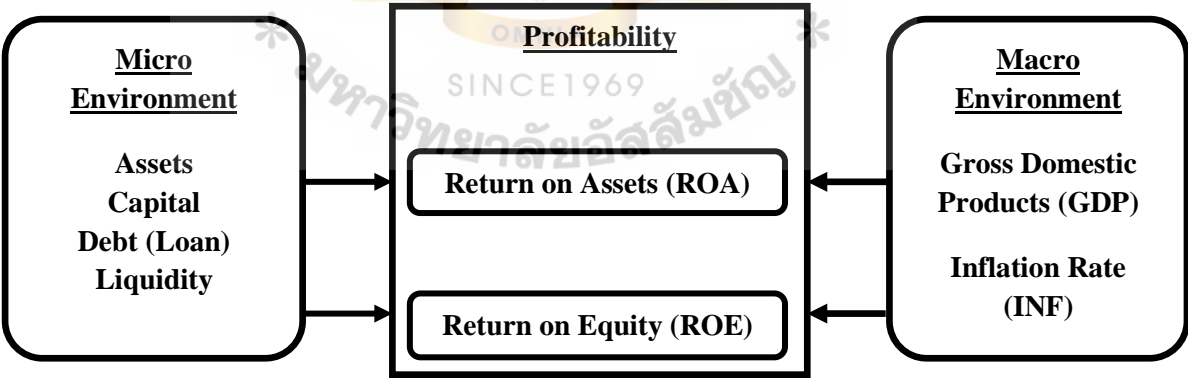
Masood and Ashraf (2012) studied bank specific and macroeconomic profitability determinants of Islamic banks. In this study, the researcher used the balanced panel data regression model in order to achieve the study objectives. The data used to study these determinants were for five years from 2006 to 2010. For this study, the researcher selected a sample of twenty five Islamic banks from twelve different countries around the world, the twelve countries are; Bahrain, Bangladesh, Indonesia, Malaysia, Pakistan, Qatar, Saudi Arabia, Sudan, Turkey, United Arab Emirates and Yemen. In this study, the dependent variable is profitability which consists of return on asset (ROA) and return on equity (ROE).

The independent variables are bank specific and macroeconomic variables in which bank specific variables consist of financial risk, gearing risk, operating efficiency, asset management, asset size, capital adequacy, asset quality, liquidity and deposits. Macroeconomic variables consist of economic growth rate and inflation rate. The findings of this study indicated that banks with larger asset sizes and with efficient management lead to greater return on assets.

3.2 Conceptual Framework

A conceptual framework is an argument that the concepts chosen for investigation or interpretation and any anticipated relationships among them will be appropriate and useful given the research problem under investigation. Like theoretical frameworks, the conceptual framework is based on previous researches and literature but conceptual frameworks are built from an array of current and possible far ranging sources (Underhill, 1991). Jabareen (2009) redefined that conceptual framework as a network or a plane of interlinked concepts that provide a comprehensive understanding of a phenomenon or phenomena. Figure 3.4 shows the conceptual framework of this study to give a better view of the relationships discussed in the following section.

Figure 3.4: A Modified Conceptual Framework of the impact of Micro and Macro Environment Factors on Profitability.



There are four independent variables under the micro environment factors where the factor of asset is adapted from the studies of Gul *et al.* (2011), Ayadi and Boujelbene (2012) and Masood and Ashraf (2012). The factor of capital is adapted from the studies of Gul *et al.* (2011) and Masood and Ashraf (2012). The factor of debt is adapted from the study of Gul *et al.* (2011). The factor of liquidity is adapted from the studies of Ayadi and Boujelbene (2012) and Masood and Ashraf (2012). There are two independent variables under the macro environment factors where the factor of gross domestic products (GDP) and inflation (INF) are adapted from the studies of Gul *et al.* (2011), Ayadi and Boujelbene (2012) and Masood and Ashraf (2012). There are two dependent variables under profitability. The factors of return on asset (ROA) and return on equity (ROE) are adapted from the study of Gul *et al.* (2011).

Thus, the relationship between the independent variables which are micro environmental and macro environmental factors and dependent variables which is profitability is established by using this conceptual framework. The examination or testing would be done whether there is a significant relationship existings between all the factors of micro environment like assets, capital, debt and liquidity with return on asset and return on equity and between the factors of macro environment like gross domestic product and inflation rate with return on asset and return on equity respectively.

3.3 Research Hypothesis

Chansomboon (2002) stated that a hypothesis is an unproven proposition or supposition that tentatively explains certain facts or phenomena. After the identification of proper variables the relationship between independent variables and dependent variables are elaborated so that relevant hypothesis could be developed and subsequently tested. In this research, a total of four hypotheses are developed for the study.

H1o: The micro environment in terms of assets, capital, debt (loan) and liquidity has no impact on profitability in terms of return on asset (ROA).

H1a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on asset (ROA).

- H2o: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has no impact on profitability in terms of return on asset (ROA).
- H2a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on asset (ROA).
- H3o: The micro environment in terms of assets, capital, debt (loan) and liquidity has no impact on profitability in terms of return on equity (ROE).
- H3a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on equity (ROE).
- H4o: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has no impact on profitability in terms of return on equity (ROE).
- H4a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on equity (ROE).

3.4 Operationalization of the Independent Variables and Dependent Variables

The operationalization table elaborates on the concept of the variables, operational components and measurement scale. The variables that are discussed in the table are the independent variables including micro environmental and macro environmental factors and the dependent variable measured as return on asset and return on equity.

Table 3.1: Operationalization Table

<u>Variables</u>	<u>Concept of Variables</u>	<u>Operational Components</u>	<u>Measurement Scale</u>
Assets	An asset is something that can potentially be changed into cash or one of the other asset categories (Westphal, 2002).	Total Asset = Natural logarithm of aseets.	Ratio Scale

Capital	Siad (2007) defined it as accumulated wealth in monetary terms.	<p>Total Capital = Short Term Debts + Long Term Funds.</p> <p>Long Term Funds = Long Term Debts + Total Equity.</p> <p>Natural logarithm of Capital.</p>	Ratio Scale
Debt (Loan)	Dippelsman <i>et al.</i> (2012) defined it as all liabilities that are debt instruments, such as financial claims that require payment(s) of interest and/or principal by the debtor to the creditor at a date, or dates in the future.	<p>Total Debt = Short Term Debts + Long Term Debts.</p> <p>Natural logarithm of Debts.</p>	
Liquidity	Adrian and Sbin (2008) defined liquidity as the rate of growth of repos, since repos and other forms of collateralized borrowing are the tool that financial institutions use to adjust their balance sheet.	<p>Liquidity = (Long Term Funds – Strategic Investment) / Working Capital Investment.</p> <p>Long Term Funds = Long Term Debt + Total Equity.</p> <p>Strategic Investment = (Total Asset – Cash Investment – Working Capital Investment) – (Total Liabilities – Short Term Debt – Long Term Debt).</p> <p>Working Capital Investment = Working Capital Assets – Working Capital Liabilities.</p>	Ratio Scale

Gross Domestic Product (GDP)	It measures the monetary value of final goods and services that is, those that are bought by the final user, produced in a country in a given period of time (Callen, 2008).	Gross Domestic Product = Annual average growth rate.	Ratio Scale
Inflation Rate (INF)	Haberler (1960) defined it as an expansion in the monetary circulation; more precisely, as an increase in the quantity of money times the velocity of circulation.	Inflation Rate = Annual average inflation rate.	Ratio Scale
Return on Asset (ROA)	It provides a perspective of a company's net profit relative to the level of assets used to generate the net profit (Siad, 2007).	Return on Asset = Net Profit / Total Asset.	Ratio Scale
Return on Equity (ROE)	It indicates how well the firm has used the resources of owners (Pandey, 2004).	Return on Equity = Net Profit / Total Equity.	Ratio Scale

CHAPTER 4

RESEARCH METHODOLOGY

In this chapter the researcher provides a detail of the methodology used in the research. There are six parts all together. The first part is the method of research used. The second part is the respondents and the sampling procedures. The third part is the research instrument. The fourth part is the pretest. The fifth part is the collection of the data and the last part is the statistical treatment of the data.

4.1 Methods of Research Used

The methods of research used are divided into two parts which consists of types of research or techniques and research method. In types of research, causal research is employed in this study and in the research method, secondary data or sources are used for this study.

4.1.1 Types of Research or Technique

Casual research aims to suggest casual linkages between variables by observing existing phenomena and then searching back through available data in order to try to identify plausible causal relationships (Ross, 2005). Further, causal research is proper when the research objective is to identify variables that cause the phenomenon being predicted and understand why they cause what is being predicted (Elahi and Dehdashti, 2011). Sekaran (2003) also stated that, most of the time there are multiple factors that influence one another. Therefore, the researcher is keen on delineating one or more factors that are undoubtedly causing the problem. In other words, the intention of the researcher conducting a causal study is to state that variable x causes variable y. So, when variable x is removed or altered in some way, problem y is solved. Furthermore, causal research attempts to establish that when we do one thing, another thing will follow. The word 'cause' is frequently used in everyday conversation, but from a scientific research perspective, a causal relationship is impossible to prove. Nevertheless, identifying causal relationship is an important aspect of a scientific inquiry and it helps to infer, predict and plan (Sun and Zhang, 2006).

The study in which the researcher wants to delineate the cause of one or more problems is called a casual study (Sekaran, 2003). Causal research is identification of cause and effect relationships between two variables (Zikmund, 2000). Therefore, since the objective of this study is to investigate the impact of the micro and macro environment on profitability of technology companies in Thailand, causal research is employed in this study.

4.1.2 Research Method

Research methods are the various procedures, schemes and algorithms used in research. All the methods used by the researcher during a research study are termed as research methods (Rajasekar *et al.*, 2013). Since, the data for this study are from annual reports of the companies and other secondary sources, therefore, secondary data are employed in this study.

In secondary data, data are gathered and recorded previously by someone else for some purposes and it is usually historical and already assembled. Therefore, access to respondents or subjects are not required (Zikmund, 2000). There are several sources of secondary data including books and periodicals, Government publications of economic indicators, census data, statistical abstracts, data base, the media and annual reports of companies (Sekaran, 2003).

4.2 Respondents and Sampling Procedure

The process of sampling involves any procedure using a small number of items or parts of the whole population to make conclusions regarding the whole population (Zikmund, 2000) and according to Latham (2007), the sample method involves taking a representative selection of the population and using the data collected as research information.

In this section, the respondents and sampling procedure of this study are discussed in detail. Various questions relating to the respondents, target population, sampling unit and size and sampling procedure are explained in this section. Firstly, the target population is explained followed by the sample and sampling unit. Lastly, the sampling size and sampling procedure will be discussed.

4.2.1 Target Population and Sample Size

According to Kitchenham and Pfleeger (2002), the target population is the group or the individuals to whom the survey applies. Further, Keller and Warrack (2000) explained the population as the observations or measurement of an entire set under the study. Thus, a population is the set of all possible measurements, generally pertaining to a group of people or objects that is of interest (Kvanli *et al.*, 2000) while a sample size is a subset of data selected from a population (Sincich, 1996). In other words, sample is a part of the population from which information is collected (Weiss, 1999).

In this study, the researcher will gather the data from the Stock Exchange of Thailand from technology companies in Thailand for one decade, which is the ten years from 2003 to 2012. Since the data is collected from secondary sources, the target population of this study focuses on thirty nine technology companies of Thailand that are listed on the Stock Exchange of Thailand for one decade (ten years) (See Appendix C for the list of the listed technology companies in Stock Exchange of Thailand), which includes eleven electronic component companies and twenty eight information and communication technology companies. Unfortunately, the researcher could consider only thirty companies for this study, nine companies from the electronic components sector and twenty one companies from the information and communication technology sector.

Due to the limitations of time and resources, the researcher sets the satisfactory and unsatisfactory conditions to select the companies for this study. To satisfy the condition, a company should at least exist on the Stock Exchange of Thailand for one decade and annual reports should be available for at least one decade, which is from 2003 to 2012. Therefore, the number of companies that satisfy the condition of this study are thirty companies (See Appendix D for the list of the satisfied technology companies). On the other hand, there are nine companies that do not satisfy the condition for this study due to two reasons, which are; unavailability of data for one decade because the registration of these companies under Stock Exchange of Thailand are under one decade that is after 2003. Therefore, it is not possible for the researcher to consider all of these companies and unavailability of data on the Stock Exchange of Thailand for more than a decade (See Appendix E for the list of the unsatisfied technology companies). Besides, there are five companies have been delisted by the Stock

Exchange of Thailand (See Appendix F for the list of the delisted technology companies in Stock Exchange of Thailand).

In this study a 95% confidence level is applied by accepting a 5% percent margin of error and the financial data are obtained from annual balance sheets and annual income statements of annual reports for ten years from 2003 to 2012 of thirty companies. Therefore, in this study after excluding nine companies which do not meet the condition, thirty companies are chosen as samples. Finally, after collecting the annual reports from thirty technology companies from the Stock Exchange of Thailand from 2003 to 2012, the researcher procured three hundred as the sample size (Thirty sample companies multiplied by ten years).

4.3 Collection of Data/Gather Procedures

Data can be obtained from primary or secondary sources. Primary data refers to information obtained firsthand by the researcher on the variables of interest for the specific purpose of the study. Secondary data refers to information gathered from sources already existing (Sekaran, 2003).

In this study the data are collected from one basic source which is secondary source. The main sources for this study are annual reports of the thirty technology companies of Thailand which are listed on the Stock Exchange of Thailand. The annual reports of the thirty selected companies were taken from Morningstar and Bloomberg. The data for this study are selected from 2003 to 2012 from the annual reports of the thirty selected companies. The other sources for this study are from some useful websites, articles, journals, textbooks and previous research. The sample size for this study is three hundred which is procured from thirty technology companies of Thailand, which are listed on the Stock Exchange of Thailand for ten years. For each company, the researcher calculated the data using formulas for ten years for both independent and dependent variables, which is for micro environment in terms of assets, capital, debt (loan), and liquidity and for profitability in terms of return on asset (ROA) and return on Equity (ROE). Thus, for each company the researcher gathered ten data. For the macro environment in terms of gross domestic product (GDP) and inflation rate (INF), the data were collected for ten years from 2003 to 2012, gathered by the researcher. Therefore summing up the data of thirty companies for ten years the researcher gathered three hundred as the sample size. The equation is given below:

Therefore;

1 Company for 10 Years (1×10) = 10 Data.

30 Companies for 10 Years (30×10) = 300 Data.

Finally, these gathered raw data are calculated in Microsoft excel based on the variables that researcher set up by using formulas (See Table 3.1) for each companies (See Appendix). Then, the calculated values are arranged serially in Microsoft excel. Since, the values of assets, capital and debts are not small and not in percentage, the researcher used a natural logarithm to minimize the value size so that it fits with other variables' values. Then, calculated data for each company are coded in SPSS version 21 according to the both independent and dependent variables.

4.4 Statistical Treatment of Data

Statistical treatment of data is very important for the study in order to give a meaning to the data gathered. The raw data are very important for the study, therefore, in order to draw the most appropriate conclusion to the study the organizing of data is most important for the study. Thus, the statistical model used in this study includes descriptive statistics and multiple regression analysis. The SPSS (Statistical Package for the Social Science) version 21 is used to analyze the data once the data collection stage is finished.

4.4.1 Descriptive Statistics

According to Sincich (1996), the branch of statistics devoted to the organization, summarization and description of data is called descriptive statistics. Descriptive statistics involves arranging, summarizing and presenting a set of data in such a way that the meaningful essentials of the data can be extracted and interpreted easily (Kelle and Warrack, 2000). Descriptive statistics are used to describe a large set of data (Kvanli *et al.*, 2000) to understand and summarize the data (Adams *et al.*, 2007). Therefore, in brief descriptive statistics consists of methods for organizing and summarizing information (Weiss, 1999).

4.4.2 Multiple Regression Analysis

According to Sykes (1992), regression analysis is a statistical tool for the investigation of relationships between variables. Usually, the investigator seeks to ascertain the causal effect of a variable upon another. The investigator assembles data on the underlying variables of interest and employs regressions to estimate the quantitative effect of the causal variables upon the variable that they influence. Furthermore, it can predict the positive or negative relationship of variables. That is how the changes in independent variables influence the changes in dependent variables (Zhang, 2009).

Since, the researcher would like to test the impact of micro and macro environment towards profitability, the least-square method is used in this study for this technique is the most used regression estimation technique. Correlations of the variables are displayed in a multiple linear regression model that adds multiple explanatory variables to the right hand side of the regression equation. In this study, the researcher used four multiple regression models. Therefore, the multiple regression model of each hypothesis is written as:

The equation of hypothesis one is written as:

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + \epsilon$$

$$ROA = \beta_0 + \beta_1 ASSETS_1 + \beta_2 CAPITAL_2 + \beta_3 DEBT_3 + \beta_4 LIQUIDITY_4 + \epsilon$$

Where:

\hat{Y} = Profitability in terms of return on asset (ROA).

β_0 = Estimated intercept of the y axis.

β_1 = Regression coefficient associated with micro environment in terms of assets.

X_1 = Micro environment in terms of assets.

β_2 = Regression coefficient associated with micro environment in terms of capital.

X_2 = Micro environment in terms of capital.

β_3 = Regression coefficient associated with micro environment in terms of debt.

X_3 = Micro environment in terms of debt.

β_4 = Regression coefficient associated with micro environment in terms of liquidity.

X_4 = Micro environment in terms of liquidity.

ϵ = Error available.

The equation of hypothesis two is written as:

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon$$

$$ROA = \beta_0 + \beta_1 GDP_1 + \beta_2 INFLATION_2 + \epsilon$$

Where:

\hat{Y} = Profitability in terms of return on asset (ROA).

β_0 = Estimated intercept of the y axis.

β_1 = Regression coefficient associated with macro environment in terms of GDP.

X_1 = Macro environment in terms of GDP.

β_2 = Regression coefficient associated with macro environment in terms of inflation.

X_2 = Macro environment in terms of inflation.

ϵ = Error available.

The equation of hypothesis three is written as:

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + \epsilon$$

$$ROE = \beta_0 + \beta_1 ASSETS_1 + \beta_2 CAPITAL_2 + \beta_3 DEBT_3 + \beta_4 LIQUIDITY_4 + \epsilon$$

Where:

\hat{Y} = Profitability in terms of return on asset (ROE).

β_0 = Estimated intercept of the y axis.

β_1 = Regression coefficient associated with micro environment in terms of assets.

X_1 = Micro environment in terms of assets.

β_2 = Regression coefficient associated with micro environment in terms of capital.

X_2 = Micro environment in terms of capital.

β_3 = Regression coefficient associated with micro environment in terms of debt.

X_3 = Micro environment in terms of debt.

β_4 = Regression coefficient associated with micro environment in terms of liquidity.

X_4 = Micro environment in terms of liquidity.

ϵ = Error available.

The equation of hypothesis four is written as:

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon$$

$$ROE = \beta_0 + \beta_1 GDP_1 + \beta_2 INFLATION_2 + \epsilon$$

Where:

\hat{Y} = Profitability in terms of return on asset (ROE).

β_0 = Estimated intercept of the y axis.

β_1 = Regression coefficient associated with macro environment in terms of GDP.

X_1 = Macro environment in terms of GDP.

β_2 = Regression coefficient associated with macro environment in terms of inflation.

X_2 = Macro environment in terms of inflation.

ϵ = Error available.

The researcher will apply a multiple linear regression model for this study in order to validate the dependent and independent variables. In this analysis there are three main indicators which would indicate the significance of this study.

Firstly, to determine how well a regression model fits the data, the value of R and R^2 is estimated. The value of R represents the measurement of the quality of prediction of the dependent variables. It shows whether the relationship between dependent and independent variables are positively or negatively related. The R value is stronger when the value is closer to one in both positive and negative direction that is $R < 1$. Further, R^2 represent the proportion of variance in the dependent variables that could be explained by the independent variables.

Secondly, to predict the statistical significance of independent variables towards the dependent variables an F test is estimated. The significant level of F test is .05, which is significant when the estimated P value is less than .05, that is $P < .05$. If the probability value is less than or equal to .05, the null hypothesis (H_0) is rejected, showing the F-test is significant which means that the multiple linear regression model is reliable. Thus, the results would prove that there is a significant relationship with the dependent variables at least with one independent variable. On the other hand, if the probability value is more than .05, the null hypothesis cannot be rejected, showing the F-test is insignificant which means that the linear regression model is not reliable. Thus, the model would not be able to be used to predict the relationship between the dependent and independent variables.

Thirdly, to predict the statistical significance of each of the independent variables, a t test is estimated. The significant level of the t test is .05, that is the t test is significant when the estimated P value is less than .05 that is $P < .05$. Thus, the results would prove that there is a significant relationship with one particular independent variable with the dependent variables. Furthermore, to indicate how much the dependent variable varies with particular independent variable when all other independent variables are held constant, unstandardized coefficients is estimated, which shows the positive or negative significance of a particular independent variable towards the dependent variables.

Table 4.1: Summary of Statistical Treatment of Hypothesis Testing in this study.

H1a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on asset (ROA).	Multiple Regression
H2a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on asset (ROA).	Multiple Regression
H3a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on equity (ROE).	Multiple Regression
H4a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on equity (ROE).	Multiple Regression

Chapter 5

Presentation of Data and Critical Discussion of the Results

In this chapter, the researcher summarized the results of the data analysis. The data are analyzed by using Statistical Package for the Social Science (SPSS) version 21. The results of the data analysis consist of two main sections. They are: descriptive analysis of the variables and hypotheses testing by using multiple regression analysis.

5.1 Descriptive Analysis of Variables

In this study, the researcher used secondary data of 30 technology companies on the Stock Exchange of Thailand from 2003 to 2012. Thus, total numbers of observations are shown in the second column of table 5.1 as 300. The third and fourth columns represent the minimum and maximum value of each variable. The fifth column represents the mean value of each variable, which reflects the average value of each variable. The sixth column represents the standard deviation of each variable, which measures the level of dispersion of data from its mean. So, the larger the standard deviation the larger the dispersion is from its mean.

Table 5.1 Descriptive Analysis of Variables

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
ROA	300	-186.54	79.42	3.1944	20.32327
ROE	300	-3249.68	651.06	-2.3625	205.13245
ASSETS	300	18.28	25.92	22.3598	1.62919
CAPITAL	300	18.07	25.47	22.0673	1.65802
DEBT	300	.00	25.34	19.2311	5.88674
LIQUIDITY	300	-11270.33	3170.15	13.1310	1017.18331
GDP	300	-2.30	7.80	4.2700	3.08054
INFLATION	300	-.80	5.48	3.0780	1.68863
Valid N (listwise)	300				

Table 5.1 shows that, the return on assets (ROA) has -186.54 minimum values, which is from the Bliss-Tel Public Company Limited in 2008 and 79.42 maximum values, which is from M-Link Asia Corporation Public Company Limited in 2012. The mean value for the return on assets (ROA) is 3.1944. The standard deviation of return on assets (ROA) is 20.32327. This indicates that the technology companies of Thailand have earned income from their total assets of 3.2% based on the data of this study from 2003 to 2012, which is a positive sign for the industry.

Table 5.1 shows that, the return on equity (ROE) has -3249.68 minimum values, which is from Bliss-Tel Public Company Limited in 2008 and 651.06 maximum values, which is from M-Link Asia Corporation Public Company Limited in 2012 . The mean value for the return on equity (ROE) is -2.3625. The standard deviation of return on equity (ROE) is 205.13245. This indicates that the technology companies of Thailand have incurred losses from their total equity of -2.4% based on the data of this study from 2003 to 2012. This shows that, companies need to improve their return on equity (ROE).

Table 5.1 shows that, the assets have 18.28 minimum values, which is from Bliss-Tel Public Company Limited in 2012 and 25.92 maximum values, which is from True Corporation Public Company Limited in 2012. The total asset is 86,663,583 and 180,363,369,730 respectively. The mean value for the assets is 22.3598. The standard deviation of assets is 1.62919. This indicates that the technology companies of Thailand have had the average total assets of about 22.4 based on the data of this study from 2003 to 2012.

Table 5.1 shows that, the capital have 18.07 minimum values, which is from Bliss-Tel Public Company Limited in 2012 and 25.47 maximum values, which is from True Corporation Public Company Limited in 2012. The total capital is 70,721,401 and 115,426,990,223 respectively. The mean value for the capital is 22.0673. The standard deviation of capital is 1.65802. This indicates that the technology companies of Thailand have had the average total capital of about 22.1 based on the data of this study from 2003 to 2012.

Table 5.1 shows that, the debt (Loan) has .00 minimum values, which are from Advanced Information Technology, Electronic Industry, Hana Microelectronics and Internet Thailand Public Company Limited in several years and 25.34 maximum values, which is from True Corporation Public Company Limited in 2012. The minimum value of .00 debt

indicated that the companies do not borrow long-term and short term debts for their operations. The total debt for True Corporation is 101,422,612,525. The mean value for the debt is 19.2311. The standard deviation of debt is 5.88674. This indicates that, the technology companies of Thailand have had an average total debt of about 19.2 based on the data of this study from 2003 to 2012.

Table 5.1 shows that the liquidity has -11270.33 minimum values and 3170.15 maximum values, which both are from TT&T Public Company Limited in 2009 and 2008 respectively. The mean value for the liquidity is 13.1310. The standard deviation of liquidity is 1017.18331. This indicates that the technology companies of Thailand have had the average capital liquidity of 13.131% based on the data of this study from 2003 to 2012.

Table 5.1 shows that, the gross domestic product (GDP) has -2.30 minimum values, which is in 2009 and 7.80 maximum values, which is in 2010. The mean value for the GDP is 4.2700. The standard deviation of GDP is 3.08054. This indicates that the average GDP of Thailand has grown 4.3% based on the data of this study during the period of 2003 till 2012.

Table 5.1 shows that, the inflation has -.80 minimum values, which is in 2009 and 5.48 maximum values, which is in 2008. The mean value for the inflation is 3.0780. The standard deviation of inflation is 1.68863. This indicates that the average inflation of Thailand has grown of 3.1% based on the data of this study during the period of 2003 till 2012.



5.2 Hypotheses Testing

For estimation purposes, the significant level of f-statistics and t-statistics are shown in this part. If the significant value is less than the 0.05 significant levels, this means that the independent variable is statistically significant to the dependent variable. However, if it is more than the 0.05 significant levels, the independent is not statistically significant.

Hypothesis 1

H1o: The micro environment in terms of assets, capital, debt (loan) and liquidity has no impact on profitability in terms of return on asset (ROA).

H1a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on asset (ROA).

Table 5.2.1 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on asset (ROA)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.201 ^a	.040	.027	20.04206

a. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

As shown in Table 5.2.1, the results from the multiple regression analysis presented that the R value is 0.201. This means that the there is a weak impact of micro environment on profitability which is return on assets (ROA). Further, multiple regression analysis presented that the R² value is 0.040. This means that the micro environment will impact return on assets (ROA) by 4% if there is positive or negative changes in micro environment.

Table 5.2.2 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on asset (ROA)

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5000.754	4	1250.188	3.112	.016 ^b
	Residual	118496.809	295	401.684		
	Total	123497.563	299			

- a. Dependent Variable: ROA
b. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

As shown in Table 5.2.2, the results from the analysis of variance (ANOVA) presented that the significance level of F-Statistics is 0.016, which is less than 0.05 ($0.016 < 0.05$). This means that the null hypothesis is rejected. Thus, the researcher concluded that there is a statistically significant impact of the micro environment on profitability which is return on assets (ROA), when determined the micro environment at the level of 0.05 significant levels. Therefore, at least one independent variable of the micro environment will impact on return on assets (ROA) of profitability.

Table 5.2.3 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on asset (ROA)

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	-35.456	16.516		-2.147	.033
	ASSETS	-.403	3.405	-.032	-.118	.906
	CAPITAL	2.673	3.316	.218	.806	.421
	DEBT	-.590	.224	-.171	-2.633	.009
	LIQUIDITY	.002	.001	.079	1.389	.166

- a. Dependent Variable: ROA

As shown in Table 5.2.3, the results of the T-Statistics presented that debt and return on equity (ROA) are significant at the level of 0.009, which is less than 0.05 ($0.009 < 0.05$). This means that the debt has a significant impact on return on assets (ROA). However, assets, capital and liquidity have no significant impact on return on assets (ROA) at the significant levels of -0.118, 0.806 and 1.389 respectively, which are more than the 0.05 significant level. Thus, the researcher concluded that assets, capital and liquidity have an impact on profitability in terms of ROA, yet not statistically significant.

At a beta of -0.403 means, when the assets of technology companies increase, the profit on ROA decreases. At a beta of 2.673 means, when capital increases in technology companies, the profit on ROA increases. At a beta of -0.590 means, when technology companies increase debt, the profit on ROA decreases. At a beta of 0.002 means, when technology companies increase liquidity level, the profit on ROA increases.

However, the multiple regression equation can be formed as follows when focusing only on the significant independent variable.

$$ROA = \beta_0 + \beta_1 DEBT_1 + \dots + \beta_n X_n$$

$$ROA = -35.456 - 0.590 * DEBT$$

Hypothesis 2

H2o: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has no impact on profitability in terms of return on asset (ROA).

H2a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on asset (ROA).

Table 5.3.1 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on asset (ROA)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.152 ^a	.023	.016	20.15499

a. Predictors: (Constant), INFLATION, GDP

As shown in Table 5.2.4, the results from the multiple regression analysis presented that the R value is 0.152. This means that the there is a very weak impact of macro environment on profitability which is return on assets (ROA). Further, multiple regression analysis presented that the R² value is 0.023. This means that the micro environment will impact return on assets (ROA) of 2.3% if there is positive or negative changes in micro environment.

Table 5.3.2 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on asset (ROA)

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2849.129	2	1424.565	3.507	.031 ^b
	Residual	120648.433	297	406.224		
	Total	123497.563	299			

- a. Dependent Variable: ROA
- b. Predictors: (Constant), INFLATION, GDP

As shown in Table 5.2.5, the results from the analysis of variance (ANOVA) presented that the significance level of F-Statistics is 0.031, which is less than 0.05 (0.031 < 0.05). This means that the null hypothesis is rejected. Thus, the researcher concluded that there is a statistically significant impact of the macro environment on profitability which is return on assets (ROA), when determined the macro environment at the level of 0.05 significant levels. Therefore, at least one independent variable of the macro environment will impact on return on assets (ROA) of profitability.

Table 5.3.3 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on asset (ROA)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.132	2.629		1.191	.234
	GDP	.952	.397	.144	2.399	.017
	INFLATION	-1.301	.724	-.108	-1.796	.074

- a. Dependent Variable: ROA

As shown in Table 5.2.6, the results of the T-Statistics presented that GDP and return on equity (ROA) are significant at the level of 0.017, which is less than 0.05 ($0.017 < 0.05$). This means that the GDP has a significant impact on return on assets (ROA). However, inflation has no significant impact on return on assets (ROA) at the significant levels of 0.074, which is more than the 0.05 significant levels. Thus, the researcher concluded that inflation has an impact on profitability in terms of ROA, yet not statistically significant.

At a beta of 0.952 it means when GDP increases, the profit on ROA of technology companies increases. At a beta of -1.301 means when inflation increases, the profit on ROA of technology companies decreases.

Therefore, the multiple regression equation can be formed as follows when focusing only on the significant independent variable.

$$ROA = \beta_0 + \beta_1GDP_1 + \dots + \beta_nX_n$$

$$ROA = 3.132 + 0.952 \cdot GDP$$

Hypothesis 3

H3o: The micro environment in terms of assets, capital, debt (loan) and liquidity has no impact on profitability in terms of return on equity (ROE).

H3a: The micro environment in terms of assets, capital, debt (loan) and liquidity has an impact on profitability in terms of return on equity (ROE).

Table 5.4.1 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on equity (ROE)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.113 ^a	.013	-.001	205.19552

a. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

As shown in Table 5.2.7, the results from the multiple regression analysis presented that the R value is 0.113. This means that the there is a very weak impact of the micro environment on profitability which is return on equity (ROE). Further, multiple regression analysis presented that the R² value is 0.013. This means that the micro environment will

impact return on equity (ROE) of 1.3% if there is positive or negative changes in micro environment.

Table 5.4.2 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on equity (ROE)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	160682.269	4	40170.567	.954	.433 ^b
	Residual	12421034.802	295	42105.203		
	Total	12581717.070	299			

- a. Dependent Variable: ROE
- b. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

As shown in Table 5.2.8, the results from the analysis of variance (ANOVA) presented that the significance level of F-Statistics is 0.433, which is more than 0.05 (0.433 > 0.05). This means that the null hypothesis is failed to reject. Thus, the researcher concluded that there is no statistically significant impact of the micro environment on profitability which is return on equity (ROE), when determined the micro environment at the level of the 0.05 significant levels. Therefore, none of the independent variable of the micro environment will impact on return on equity (ROE) of profitability

Table 5.4.3 Analysis of the impact of Micro environment in terms of assets, capital, debt (loan) and liquidity on profitability in terms of return on equity (ROE)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-319.424	169.094		-1.889	.060
	ASSETS	13.210	34.858	.105	.379	.705
	CAPITAL	2.910	33.953	.024	.086	.932
	DEBT	-2.212	2.293	-.063	-.965	.335
	LIQUIDITY	.000	.012	.002	.035	.972

- a. Dependent Variable: ROE

As shown in Table 5.2.9, the results of the T-Statistics presented that assets, capital, debt and liquidity have no significant impact on return on equity (ROE) at the significant levels of 0.705, 0.932, 0.335 and 0.972 respectively, which are more than the 0.05 significant levels. Thus, the researcher concluded that the assets, capital and debt have an impact on profitability in terms of ROE, yet not statistically significant and it shows statistically that there is no significant impact from inflation.

At a beta of 13.210 it means when an asset increases in technology companies, the profit on ROE increases. At a beta of 2.910 it means when technology companies increases capital, the profit on ROE increases. At a beta of -2.212 means when technology companies increases their debt, the profit on ROE decreases. At a beta of 0.000 it means the liquidity level has no impact on ROE.

Hypothesis 4

H4o: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has no impact on profitability in terms of return on equity (ROE).

H4a: The macro environment in terms of gross domestic products (GDP) and inflation rate (INF) has an impact on profitability in terms of return on equity (ROE).

Table 5.5.1 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on equity (ROE)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.108 ^a	.012	.005	204.60987

a. Predictors: (Constant), INFLATION, GDP

As shown in Table 5.2.10, the results from the multiple regression analysis presented that the R value is 0.108. This means that the there is a very weak impact of macro environment on profitability which is return on equity (ROE). Further, multiple regression analysis presented that the R² value is 0.012. This means that the macro environment will impact return on equity (ROE) of 1.2% if there is positive or negative changes in macro environment.

Table 5.5.2 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on equity (ROE)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	147752.876	2	73876.438	1.765	.173 ^b
	Residual	12433964.194	297	41865.199		
	Total	12581717.070	299			

- a. Dependent Variable: ROE
- b. Predictors: (Constant), INFLATION, GDP

As shown in Table 5.2.11, the results from the analysis of variance (ANOVA) presented that the significance level of the F-Statistics is 1.765, which is more than 0.05 ($1.765 > 0.05$). This means that the null hypothesis is failed to reject. Thus, the researcher concluded that there is no statistically significant impact of the macro environment on profitability which is return on equity (ROE), when determined the macro environment at the level of 0.05 significant levels. Therefore, none of the independent variable of the macro environment will impact on return on equity (ROE) of profitability.

Table 5.5.3 Analysis of the impact of Macro environment in terms of GDP and inflation on profitability in terms of return on equity (ROE)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.562	26.685		-.133	.894
	GDP	6.910	4.030	.104	1.715	.087
	INFLATION	-9.196	7.352	-.076	-1.251	.212

- a. Dependent Variable: ROE

As shown in Table 5.2.12, the results of the T-Statistics presented that GDP and inflation have no significant impact on return on equity (ROE) at the significant levels of 0.087 and 0.212 respectively, which are more than the 0.05 significant levels. Thus, the researcher concluded that GDP and inflation have an impact on profitability in terms of ROE, yet not statistically significant.

At a beta of 6.910 it means when GDP increases, the profit of technology companies on ROE increases. At a beta of -9.196 it means when inflation increases, the profit of technology companies decreases.

Table 5.3 Summary of hypotheses results

Hypotheses	Significant Value (alpha)	Beta (β) Value	Result
H1_o: The micro environment in terms of assets, capital, debt and liquidity has no significant impact on profitability in terms of ROA. <ul style="list-style-type: none"> Assets Capital Debts Liquidity 	0.906 0.421 0.009 0.166	-0.403 2.673 -0.590 0.002	Failed to reject Failed to reject Reject H _o Failed to reject
H2_o: The macro environment in terms of GDP and Inflation has no significant impact on profitability in terms of ROA. <ul style="list-style-type: none"> GDP Inflation 	0.017 0.074	0.952 -1.301	Reject H _o Failed to reject
H3_o: The micro environment in terms of assets, capital, debt and liquidity has no significant impact on profitability in terms of ROE. <ul style="list-style-type: none"> Assets Capital Debts Liquidity 	0.705 0.932 0.335 0.972	13.210 2.910 -2.212 0.000	Failed to reject Failed to reject Failed to reject Failed to reject
H4_o: The macro environment in terms of GDP and Inflation has no significant impact on profitability in terms of ROE. <ul style="list-style-type: none"> GDP Inflation 	0.087 0.212	6.910 -9.196	Failed to reject Failed to reject

The results from Table 5.3 presented that the debt from the micro environment and GDP from the macro environment have a statistically significant impact on profitability in terms of return on assets (ROA). Therefore, Table 5.3 showed that debt statistically significant at the level of 0.009, which is less than 0.05 ($0.009 < 0.05$). This mean, managing the debt is significant for the technology companies of Thailand to attain more profit. Further, GDP is statistically significant at the level of 0.017, which is less than 0.05 ($0.017 < 0.05$). This mean, GDP has a significant impact on the management of assets of technology companies of Thailand. However, variables like assets, capital and liquidity from the micro environment and inflation from the macro environment are statistically insignificant on ROA. Further on ROE, all the variables are statistically insignificant. This mean, assets, capital, liquidity and inflation are not important factors in predicting ROA of technology companies. Furthermore, all the variables are not important factors in predicting ROE of technology companies.



Chapter 6

Summary, Conclusions and Recommendations

In this chapter the researcher analyses the results of the descriptive analysis and inferential analyses that have been used to test the hypotheses. The first section, the researcher summarizes the research findings which included descriptive analysis and hypotheses testing. The second section includes the discussion and conclusions of this study. The third section presented the recommendation and the suggestions for further study.

6.1 Summary of Findings

The objectives of this research are to examine how the micro and macro environment in terms of assets, capital, debt (loan), liquidity, GDP and inflation impact the profitability of listed technology companies of Thailand on the Stock Exchange of Thailand from 2003 to 2012, using return on assets (ROA) and return on equity (ROE). The researcher collected the secondary data from financial statements of these companies and then used Microsoft Excel to analyze the variables needed for the study. Finally, to identify the impact of the independent variables on the dependent variables, the researcher implied multiple regression analysis.

6.1.1 Summary of Descriptive Findings

Table 6.1: Descriptive Statistics

	Mean
ROA	3.1944
ROE	-2.3625
ASSETS	22.3598
CAPITAL	22.0673
DEBT	19.2311
LIQUIDITY	13.1310
GDP	4.2700
INFLATION	3.0780
Valid N (listwise)	

In this study, the researcher used the data of 30 companies for one decade. Therefore, the total observations were 300. The average value of return on assets is 3.1944. It means that technology companies have generated 3.2% of return on assets (ROA) every year on an average from 2003 to 2012. The average value of return on equity (ROE) is -2.3625. It means

that that technology companies have generated -2.4% of return on equity (ROE) every year on an average from 2003 to 2012. The average value of assets is 22.3598. It means that the technology companies have had both the current assets and fixed assets on an average of 22.4 every year from 2003 to 2012. The average value of capital is 22.0673. It means that technology companies have had both the short term funds and long term funds on an average of 22.1 every year from 2003 to 2012. The average value of debt is 19.2311. It means that the technology companies have had both the short term debts and long term debts on an average of 19.2 every year from 2003 to 2012. The average value of liquidity is 13.1310. It means that the availability of liquid assets in technology companies is on an average of 13.13% every year from 2003 to 2012. The average value of GDP is 4.2700. It means that the GDP of Thailand has grown on an average of 4.3% from 2003 to 2012. The average value of inflation is 3.0780. It means that the inflation of Thailand has grown on an average of 3.1% from 2003 to 2012.

6.1.2 Summary of Hypotheses Testing

In this study, the four hypotheses are analyzed and tested by using multiple regression analysis. The following are the summary of all the tested results:

Hypothesis 1: The micro environment in terms of debt (loan) has statistically significant and impact on profitability in terms of return on asset (ROA) at the 0.009 significant level, whereas, assets, capital and liquidity were statistically insignificant but impacted profitability in terms of return on asset (ROA) at the 0.906, 0.421 and 0.166 significant level, respectively.

Hypothesis 2: The macro environment in terms GDP has statistically significant and impact on profitability in terms of return on asset (ROA) at the 0.017 significant level, whereas, inflation was statistically insignificant but impacted profitability in terms of return on asset (ROA) at the 0.074 significant level.

Hypothesis 3: The micro environment in terms of assets, capital, debt (loan) and liquidity was statistically insignificant but impacted profitability in terms of return on equity (ROE) at the 0.705, 0.932, 0.335 and 0.972 significant level, respectively.

Hypothesis 4: The macro environment in terms of GDP and inflation was statistically insignificant but impacted profitability in terms of return on equity (ROE) at the 0.087 and 0.212 significant level, respectively.

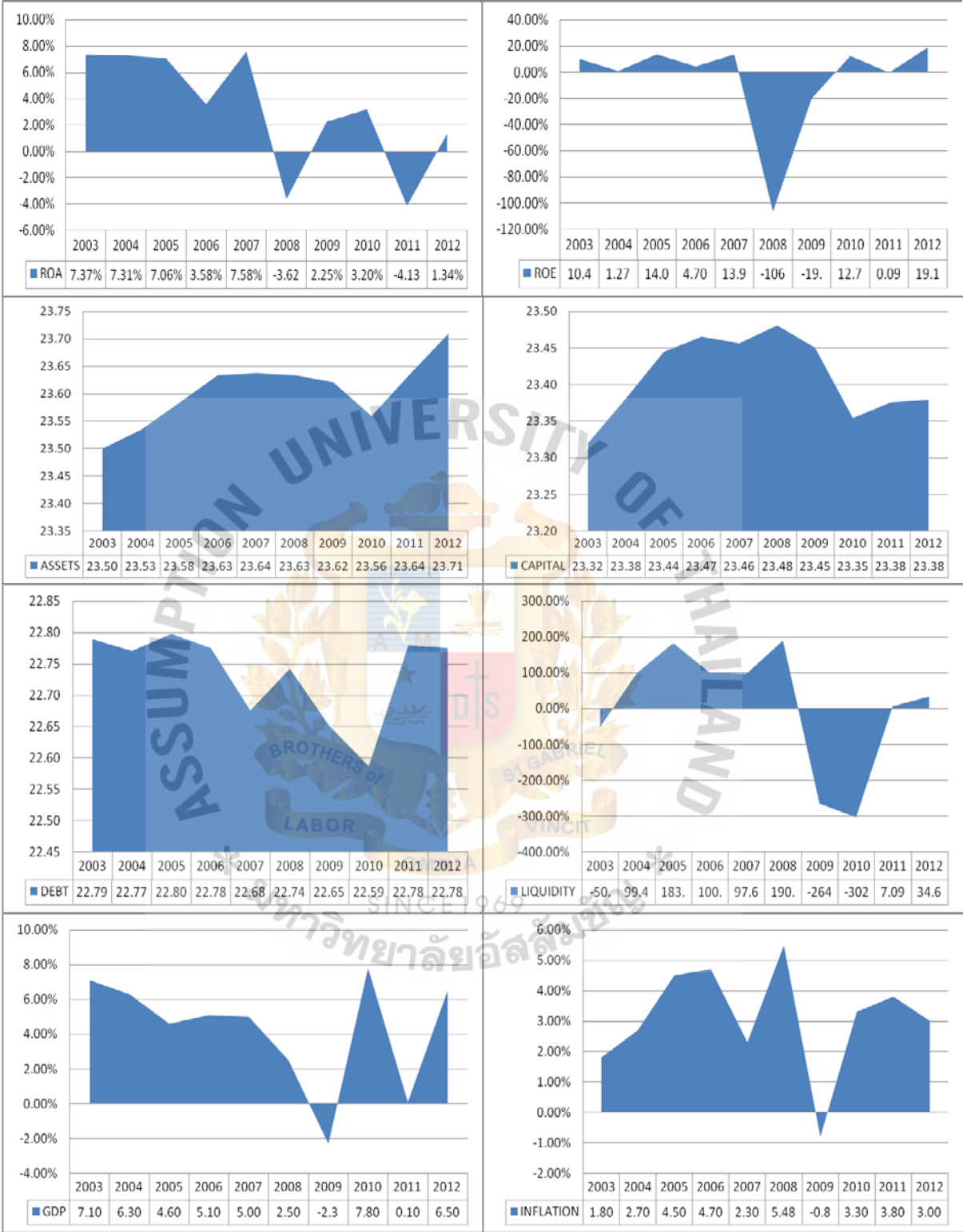
6.2 Discussions and Implications

As stated in the research objectives and statement of problem, the researcher has made an effort through this study to find out whether there is an impact of the micro and macro environment on profitability. Where the micro environment variables are assets, capital, debt and liquidity and the macro environment variables are GDP and inflation. In this research, profitability is measured by two variables, which are; return on assets (ROA) and return on equity (ROE).

6.2.1 Descriptive results

The descriptive analysis of 30 technology companies of Thailand for one decade presented that the technology industry of Thailand is generating 3.2% profit of what they have invested in the assets. However, the technology industry of Thailand could not generate positive returns on equity by losing -2.4%. The technology industry of Thailand accumulated 22.4 assets and 22.1 capital during the period of 2003 to 2012. They also borrowed 19.2 debt during 2003 to 2012. The technology industry maintained 13.1% of liquidity level, which means they depend mostly on short term debt rather than long term debt. Lastly, during 2003 to 2012 the economy of Thailand changed a lot. Thus, GDP has shown an average of 4.3%, which is just an average rate and inflation has shown an average of 3.1%, which is slightly above the average. Therefore, for a better explanation the researcher will produce a figure below which shows every variable in each year.

Figure 6.2: Average values of variables in years



Source: Created by the author from descriptive analysis.

According to the Figure 6.2, during 2009 both the GDP and inflation of Thailand had plunged into -2.3% and 0.8% respectively. However, during 2012 GDP and inflation had grown into 6.50% and 3% respectively. Notwithstanding, GDP plunged during 2011 again into 0.1% and the inflation increased to 3.8%. Thus, these have clearly shown that the crisis, which the researcher discussed in chapter 1 (See figure 1.1, 1.2 and 1.3), have highly impacted the economy of Thailand. Especially deflation in 2009 which shows the direct impact on GDP, where the New York Times (2010) also claimed that some economic problems get worse as inflation falls, and that too low an inflation rate may actually be economically damaging.

According to the Figure 6.2, during 2009, the great 2007 – 2008 global financial crisis, variables such as assets, capital, debt and liquidity have showed the dramatic change. Assets, capital and debt have declined during this period and rose after the aftermath. Additionally, liquidity has changed subsequently from negative to positive in the beginning, then positive to negative and increased only when the market had recovered from its total disaster. Thus, these have clearly shown that managers and executives of the technology companies of Thailand have deliberately took the decision to manage and control its internal variables while the macro environment had been impacting the industry badly or the other way around, internal factors have just followed the trend of the macro environment.

Therefore, according to Figure 6.2, ROA and ROE also have had a dramatic change during the disaster. ROA has shown negative growth during 2008 and 2011 and ROE during 2008 and 2009. These have clearly shown that there is an impact of the micro and macro environment on technology companies of Thailand. In ROA, -3.62% on 2008 and -4.13% on 2011 and in ROE, -106% on 2008 and 19% on 2009 have shown that these companies are highly vulnerable to disasters. Therefore, it indicates that managers or executives have to manage and control the internal factors soberly, in spite of a 3.2% positive average profit in the whole industry (See Table 5.1), to make it into the way it was before. The -2.4% average ROE profit for the whole industry has shown that investors have to make critical decisions before investing in the industry (See table 5.1). However, the negative return on equity happened only because of some few companies that have performed badly; otherwise the ROE's of profitable companies are highly lucrative. During 2012 the ROE's climbed up to 19.1% from dual great catastrophic disasters, therefore, it is a profitable industry to invest in. However, companies still need to improve the return for on equity.

6.2.2 Hypotheses Results: Multiple Regression Analysis

The results of multiple regression analysis have shown that the debt and GDP has a significant impact on profitability in terms of ROA (See table 5.2.3 and 5.3.3), where debt is in the micro environment and GDP is the macro environment.

Based on the results of hypothesis one, the researcher found that, assets have a negative impact and are statistically insignificant on ROA. Thus, ROA reflects that larger the assets size, there is lower ROA. Despite insignificant, maintenance of efficient levels of assets plays a significant role in obtaining a higher ROA. This result has shown that technology companies of Thailand generate lower ROA with the increase in assets size. Thus, ROA of technology companies of Thailand will change -0.403 (see table 5.2.3) with every increase or decrease in the assets size. This result is consistent with the results of previous studies of Horne and Wachowicz (2004) and Gury et al., (1999) who found that assets have a negative impact on profitability.

The capital has a positive impact and is statistically insignificant on ROA. Thus, it indicated that when total capital increases the profit margin of ROA of technology companies of Thailand also increases. Despite insignificant, technology companies of Thailand have to increase their capital in order to attain higher margins of profits. Thus, ROA of technology companies of Thailand will change 2.673 (see table 5.2.3) with the every increase or decrease in the total capital. This result is consistent with the results of previous studies of Qureshi and Yousaf (2014) who found capital positively and statistically not significant on profitability.

The debt has a negative impact and is statistically significant on ROA. This result is consistent with the results of previous research of Molyneux and Thornton (1992); Athanasoglou *et al.*, (2005) and Miller and Noulas (1997) who found that debt has negatively and significantly impacts on profitability. This indicated that the more debt the company has, there is a significant decline of ROA. Therefore, it is important for the technology companies of Thailand to maintain a good quality of debt level. Thus, the manager or executives of technology companies of Thailand have to decide the most profitable options of acquiring the debt. This is because ROA of technology companies of Thailand will change -0.59 (See Table 5.2.3) with every increase or decrease in the debt level of technology companies of Thailand.

The liquidity has a very low positive impact and is statistically insignificant on ROA. Thus, it indicated that when there is an increase or decrease in liquidity level, ROA of technology companies of Thailand will changed only 0.002, which a very low change rate. This result is consistent with the previous study of Qureshi and Yousaf (2014), who found a positive impact on profitability but insignificant in domestic firm sectors, and Owolabi *et al.*, (2011) who found a positive impact on profitability but insignificant in manufacturing sectors.

Based on the result of hypothesis two, the researcher found that, GDP has a positive impact and is statistically significant on ROA. This result is consistent with the results of previous studies of Bikker and Hu (2002); Kosmidou *et al.*, (2005); Pasiouras and Kosmidou (2006); Pasiouras and Kosmidou (2007); Hasan and Bashir (2003); Ayadi and Boujelbene (2012) and Hefferman and Fu (2008) who found GDP has a positive impact and is statistically significant on profitability. This indicated that, the higher the economic growth the higher the profitability of the firms. This has proven that the technology companies of Thailand are generating more profits when the GDP of Thailand is positively high and vice versa (See Figure 6.2). Therefore, it is suitable for the managers or executives to respond according to the trend of GDP. This is because, ROA of technology companies of Thailand will change 0.952 (See Table 5.3.3) with every increase or decrease in the GDP rate of Thailand.

The inflation has a negative impact and is statistically insignificant on ROA. Thus, it indicated that when inflation increases the profitability of technology companies of Thailand decreases. Thus, ROA of technology companies of Thailand will change -1.301 (See Table 5.3.3) with every increase or decrease in the inflation rate. This result is consistent with the results of previous studies of Ayadi and Boujelbene (2012) who found negative impacts on profitability and of Masood and Ashraf (2012) who found inflation insignificant on profitability.

Based on the result of hypothesis three, the researcher found that, assets have a positive impact and are statistically insignificant on ROE. ROE reflects that the higher the assets size, the higher the ROE. Despite insignificant, technology companies of Thailand can share higher profits with shareholders when there is a higher assets size. Thus, ROE of technology companies of Thailand will change 13.21 (See Table 5.4.3) with every increase or

decrease in the assets size. This result is consistent with the results of previous studies of Paradogonas (2007); Sayeed and Hogue (2009) and Bourke (1989) who found a positive impact on profitability.

The capital has a positive impact and is statistically insignificant on ROE. Thus, it indicated that when total capital increases, the profit margin on ROE of technology companies of Thailand also increases. Despite insignificant, technology companies of Thailand have to increase its capital in order to attain higher margin of profits for its shareholders. Thus, ROE of technology companies of Thailand will change 2.91 (See Table 5.4.3) with every increase or decrease in the total capital. This result is consistent with the results of previous study of Qureshi and Yousaf (2014) who found capital positively and statistically not significant on profitability.

The debt has a negative impact and is statistically insignificant on ROE. Thus, it indicated that when the debt level increases in the technology companies, the profit margin on ROE decreases. Therefore, it is important to reduce the debt level for the technology companies in order to attain higher profit margins on ROE. This result is consistent with the results of previous research of Asma *et al.*, (2011); Kosmidou *et al.*, (2005); Ho and Saunders (1981); Ayadi and Boujelbene (2012) and Valverde and Fernandez (2007) who found that debt has an impact and statistically insignificant on profitability. Despite insignificant, ROE of technology companies of Thailand will change -2.212 (See Table 5.4.3) with every increase or decrease in the debt level of technology companies of Thailand.

The liquidity has no impact and statistically is insignificant on ROE. Thus, it indicated that when there is a change in liquidity, there is no change on ROE. This result is consistent with the previous study of Nunes *et al.*, (2009) who found a neutral relationship of liquidity with firm's profitability.

Based on the result of hypothesis four, the researcher found that, GDP has a positive impact and is statistically insignificant on ROE. This result is consistent with the results of previous studies of Demirguc-kunt and Huizinga (1999) and Naceur and Goaid (2005) who found GDP insignificant. Despite insignificant, ROE of technology companies of Thailand will change 6.91 (See Table 5.5.3) with every increase or decrease in the GDP rate of technology companies of Thailand. Thus, it indicated that when GDP is high, the profit

margin of ROE is also high, at the same time, when GDP is low, the profit margin of ROE is low or even badly negative.

The inflation has a negative impact and is statistically insignificant on ROE. Thus, it indicated that when inflation increases the profit margin on ROE of technology companies of Thailand decreases. This result is consistent with the results of previous studies of Ayadi and Boujelbene (2012) who found a negative impact on profitability and of Masood and Ashraf (2012) who found inflation insignificant on profitability. Thus, ROE of technology companies of Thailand will change -9.196 (See Table 5.5.3) with every increase or decrease in the inflation rate.

6.3 Conclusion

This study is theoretically based on several previous studies in order to develop the profitability model on technology companies of Thailand. The researcher has employed the various theories which included in this study are Assets, Capital, Debt and Liquidity as micro environment. The researcher employed Gross Domestic Product (GDP) and Inflation as the macro environment. In this study, the researcher studied the impact of the micro and the macro environment on profitability of technology companies of Thailand. To measure the profitability, the researcher employed the two main profitability ratios which are return on assets (ROA) and return on equity (ROE).

The study has been conducted on thirty technology companies of Thailand which are listed on the Stock Exchange of Thailand (SET) for the period of one decade which is from 2003 to 2012. The technology industry in Thailand is made up of two main sectors. There are eleven electronic component sectors and twenty eight companies from the information and communication technology sector. However, the researcher could use only nine electronic component companies and twenty one information and communication technology companies. The researcher employed the multiple regression analysis to test all the hypotheses. The results of the hypotheses concluded that debt and GDP had an impact and is statistically significant on profitability in terms of ROA only. Despite being insignificant, the micro environment variable like assets, capital and liquidity have an impact on ROA where as liquidity has no impact on ROE, except assets, capital and debt. Furthermore, the macro environment variables GDP and inflation both have an impact on ROE despite being insignificant and inflation has an impact and is statistically insignificant on ROA also.

6.4 Recommendations

6.4.1 Recommendation on Descriptive Analysis

Based on the results of the descriptive analysis, it is clear that technology companies of Thailand have highly impacted by the micro and macro environment. Therefore, the researcher would like to recommend to the investors that companies in the technology industry of Thailand are risky to invest during global crisis, especially in a financial crisis, political crisis, war and natural calamities. Firstly, the returns on equity of these companies were -2.4% (See Table 5.1) for one decade and decreased significantly where there were problems in the market (See Figure 6.2). Despite positive return on assets, 3.2% (See Table 5.1) ROA is still low. However, investors could invest by opting for the companies whose ROA and ROE is highly profitable.

6.4.2 Recommendation on the Result of Hypotheses

Based on the results of hypothesis one, debt has had a negatively significant impact on profitability which is on ROA only. This means, an increase in debt leads to a decrease in ROA. Therefore in order to improve ROA, the researcher recommends that the technology companies should improve debt in following ways:

1. The technology companies should reduce its dependency on short term debts while inflation rate is high or above the normal rate to avoid the high rate of interest. When inflation is high, the financial institute increases the interest rate on loans to control the rise of inflation. In figure 6.2, inflation is at its highest rate on 2005, 2006 and 2008 and during this period, the technology companies have also highly depended on short term debts. Therefore, technology companies of Thailand faced a high risk when using short term debts when inflation is high. Thus, lowering the volume of short term debts would be a great decision for technology companies of Thailand.
2. The technologies companies should take advantage of low interest rates. They should increase more of their short term debts rather than long term debts when interest rates are low. The financial institution decreases the interest rate when the inflation rate is low or even in deflation to control the deflation. In figure 6.2, during 2009 deflation, the technology companies have highly depended on long term debt .Therefore, short term debts are more suitable when there is low interest rates on debt.

However, the variables like assets, capital and liquidity are statistically not significant and yet have an impact on ROA. The assets have a negative impact on ROA, this mean that the more assets the company has there is less profitability. According to the Figure 6.2, the ROA of technology companies decreases as the asset size increases. Therefore in order to increase ROA, the researcher recommends that the technology companies of Thailand should reduce acquiring assets when the ROA is low and increase when the ROA is high.

The capital has a positive impact on ROA, this mean that increase in capital will increase profitability. Figure 6.2 shows that when capital increase the ROA of technology companies also increase and vice versa. Therefore, to improve ROA the researcher recommends that the technology companies of Thailand should maintain their capital mainly by not allowing capital to decrease when ROA decreases. To do this, the company should choose the best financial resources, whether to depend on short term debt or long term debt or equity.

The liquidity has a positive impact on ROA, this mean that increases in liquidity will increase ROA. However, liquidity has an impact on ROA only for 2% (See Table 5.2.3). Therefore, the researcher recommends that this would be more appropriate when interest rates are low, otherwise long term debts and equities are more preferable. Therefore, technology companies should increase short term debt or funds more when there are low interest rates.

Based on the results of hypothesis two, GDP has positive impact and is statistically significant on profitability which is on ROA only. This mean, an increase in GDP leads to an increase in ROA. Therefore, technology companies of Thailand could make decisions by evaluating the GDP. Thus, the researcher recommends that the Technology companies of Thailand should try to maintain the ROA level when GDP is low or negative. Figure 6.2 showed that when GDP is low, ROA declined and vice versa. Therefore to do this, technology companies should increase their liquidity levels by setting aside more cash so that they could be able to operate as normal even if there is a low ROA. To increase the cash, they can borrow more short term debt, heighten retain earnings but this may be risky and reduce investing in fixed assets like plant and equipment during this period. Yet, if GDP is high they should do the opposite.

However, inflation has a negative impact on ROA, this mean that increase in inflation will decrease ROA. Inflation causes price to rise and fall of real value of money. Thus, it affects business and personal life. However, inflation impacts tangible fixed assets positively or no impact and impacts positively intangible fixed assets. Therefore, the researcher recommends that the technology companies of Thailand could improve fixed assets while inflation is high. For instance, as the inflation rate increases the value of goodwill increases. Yet, during deflation they should take the advantage of low interest rates and borrow more short term loans to invest more.

Based on the result of hypothesis three, the null hypothesis is failed to reject. Therefore, all the variables of micro environment are statistically not significant on ROE, yet have an impact on assets, capital and debts. Therefore, the researcher recommends that the investor should invest in technology companies of Thailand with careful investigation or analysis. Figure 6.2 showed that assets size increases sharply after the crisis while ROE change slightly. This might attract investors because more investors are tense to invest when there are assets size increases. However, capital decreases sharply during crisis and increase slightly. This shows that the capital management of these companies is not efficient enough. Thus, investor could understand that the equity capital is being managed inefficiently. Furthermore, debt level increased sharply after the crisis in spite of negative impact. This means that technology companies are having heavy debts. Thus, investors should invest in the companies whose capital is increasing and whose debt level is decreasing or rising slightly.

Based on the results of hypothesis four, the null hypothesis is failed to reject. Therefore, all the variables of macro environment are statistically not significant on ROE, yet have an impact. Table 5.5.3 showed that the technology companies of Thailand are highly vulnerable for any global economic crisis. Therefore, the researcher recommends that the investor should not invest in these companies without proper analysis while the global market is in crisis. Further, the impact of GDP and inflation on ROE is very high. If there is any slide in unfavorable events, it seems the market react will very fast. Therefore, avoiding such events would be a great decision for any investor. However, this is not the end for any investor, investors could still find alternatives by investing in different sectors such as precious metals, agricompanies, whose demand is often very high, profitable companies with

long histories and financially stable companies and real estate. Additionally, deep environmental assessment would help to invest in the right and profitable markets.

6.5 Further Study

This study focuses on testing the impact of the micro environment by using assets, capital, debts and liquidity and the macro environment by using gross domestic product (GDP) and inflation on profitability by using return on assets (ROA) and return on equity (ROE). This study concentrates on both the internal and external factors, but there are many internal and external factors affecting profitability of the firms such as the wages, human assets, liquidity ratio, acid-test ratio, quick ratio, capital structure, degree of competition, substitutes, politics, laws and regulations, etc. Besides, in this study r-square showed very low in all the hypotheses. This means that there are other factors that could impact profitability more significantly than the factors of this study. Therefore, future studies should include those internal and external factors to make the model more objective and accurate.

The samples of this study are listed companies on the Stock Exchange of Thailand. As a result, the findings of this study cannot represent the whole technology sector and cannot represent the whole industry in the Thai market. Further, this study uses the data of companies in Thailand only. Therefore, the results cannot be relevant to other countries. Therefore, future studies should expand the scope of study to different sectors and countries to make the results of the study more relevant.

This research gathered the data for the period of one decade (2003 to 2012). In this period there were many international and national events such as financial crisis, tsunami or flooding that have had an impact on the profitability of the companies. Thus, the results of this study may be different in other periods of time and situations. Therefore, the researchers in the future should investigate the profitability for longer periods of time or for different market situations to make the results of the study more relevant.

The researcher of this study would like to compare the differences between factors affecting profitability of technology companies and other companies both domestically and internationally. Therefore, comparative future research on the factors affecting profitability of technology companies and other companies needs to be conducted both domestically and internationally.

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APPENDIX A

The Main Destination of Each Product



Computer & Accessories

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	China	57,134.7	25.5
2	USA	35,622.7	15.9
3	Hongkong	34,782.4	15.5
4	Malaysia	17,060.3	7.6
5	Japan	12,970.5	5.8
6	Netherlands	10,089.3	4.5
7	Singapore	8,997.5	4.0
8	Germany	4,345.8	1.9
9	Czech Republic	3,652.5	1.6
10	Mexico	3,386.8	1.5
11	Other	188,042.5	16.2

Auto part & Accessories

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	Australia	35,600.3	16.5
2	Indonesia	25,448.2	11.8
3	Malaysia	14,516.0	6.7
4	Japan	14,147.9	6.6
5	Saudi Arabia	11,226.7	5.2
6	Philippines	9,701.9	4.5
7	Russia	6,039.2	2.8
8	South Africa	5,849.1	2.7
9	Emirates	5,201.3	2.4
10	Oman	4,051.3	1.9
11	Other	131,781.9	38.9

Gems & Jewelry

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	Switzerland	61,017.6	36.5
2	Hong Kong	32,445.9	19.4
3	USA	17,322.8	10.4
4	Australia	9,363.6	5.6
5	India	4,818.5	2.9
6	Denmark	4,593.6	2.7
7	Japan	4,441.9	2.7
8	Belgium	4,118.4	2.5
9	UK	3,460.6	2.1
10	Germany	3,344.6	2.0
11	Other	144,927.5	13.2

Rubber

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	China	50,535.0	30.6
2	Japan	24,986.4	15.1
3	Malaysia	20,265.2	12.3
4	USA	15,109.9	9.1
5	South Korea	11,497.6	7.0
6	Brazil	5,250.0	3.2
7	Taiwan	3,553.7	2.2
8	Spain	3,297.1	2.0
9	Poland	2,991.2	1.8
10	Singapore	2,737.9	1.7
11	Other	140,224.0	15.0

Plastic

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	China	26,809.8	24.2
2	Indonesia	10,928.8	9.8
3	Japan	10,075.8	9.1
4	India	6,470.3	5.8
5	Hong Kong	6,463.1	5.8
6	Vietnam	6,015.4	5.4
7	Malaysia	4,419.5	4.0
8	Australia	4,006.3	3.6
9	Turkey	2,959.5	2.7
10	Taiwan	2,614.3	2.4
11	Other	80,762.8	27.2

Chemical Products

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	China	28,277.1	27.5
2	India	10,331.7	10.1
3	Indonesia	7,510.0	7.3
4	Singapore	6,644.4	6.5
5	Malaysia	5,722.2	5.6
6	Vietnam	5,323.6	5.2
7	Taiwan	5,189.2	5.1
8	Japan	5,129.9	5.0
9	Netherlands	3,021.6	2.9
10	Saudi Arabia	2,421.4	2.4
11	Other	79,571.1	22.4

Electronic Circuit

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	Hong Kong	29,010.3	28.9
2	Singapore	12,024.7	12.0
3	Japan	9,199.8	9.2
4	China	8,068.5	8.0
5	Taiwan	8,049.4	8.0
6	USA	6,885.6	6.9
7	Malaysia	6,411.5	6.4
8	Philippines	5,288.1	5.3
9	Netherlands	5,229.0	5.2
10	South Korea	4,253.5	4.2
11	Other	94,420.4	5.9

Rubber Products

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	China	23,438.5	23.9
2	USA	19,840.2	20.2
3	Japan	5,558.5	5.7
4	Malaysia	5,063.3	5.2
5	Vietnam	3,514.5	3.6
6	Australia	3,062.9	3.1
7	Germany	2,860.7	2.9
8	Indonesia	2,211.4	2.3
9	Hong Kong	2,004.5	2.0
10	Netherlands	1,836.1	1.9
11	Other	69,390.6	29.2

Refine Fuel

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	Singapore	32,739.8	34.1
2	Malaysia	11,564.8	12.0
3	Lao	8,664.1	9.0
4	China	8,464.4	8.8
5	Vietnam	7,876.8	8.2
6	Burma	5,020.0	5.2
7	Cambodia	4,635.6	4.8
8	Philippines	3,693.4	3.8
9	Australia	3,210.5	3.3
10	South Korea	2,194.7	2.3
11	Other	88,064.1	8.5

Rice

Country		Jan – May 2011	
		Value (Million Baht)	(%)
1	Nigeria	8,217.2	9.5
2	Indonesia	8,184.1	9.4
3	Bangladesh	7,099.5	8.2
4	Iraq	6,710.7	7.7
5	USA	4,726.4	5.4
6	Iran	4,084.5	4.7
7	South Africa	3,686.0	4.2
8	China	3,192.4	3.7
9	Hong Kong	2,736.0	3.2
10	Malaysia	2,603.3	3.0
11	Other	51,240.1	41.0

Source: Thai Export Product.

<http://www.thaieexportproduct.com/top10thaieexportproducts.php> accessed the data on 4/6/2014 at 2:30 pm.

APPENDIX B

The Main Export and Import of Thailand (As on 2011)



MAIN EXPORT COUNTRIES OF THAILAND (As on 2011)

Serial Number	Country	Value: In US \$	Percentage
1	China	\$31,417,025,244.99	13%
2	Japan	\$23,623,257,354.89	10%
3	United States	\$22,524,941,507.84	9.60%
4	Hong Kong	\$14,616,817,966.30	6.20%
5	Malaysia	\$11,878,817,041.35	5.00%
6	Indonesia	\$10,407,375,525.72	4.40%
7	Singapore	\$10,285,387,676.24	4.40%
8	Australia	\$8,688,808,866.16	3.70%
9	Vietnam	\$6,564,600,749.06	2.80%
10	Germany	\$5,363,676,986.81	2.30%
11	South Korea	\$5,310,957,878.89	2.30%
12	India	\$4,971,829,275.35	2.10%
13	Switzerland	\$4,747,866,456.43	2.00%
14	Netherlands	\$3,967,762,037.50	1.70%
15	United Kingdom	\$3,910,069,721.78	1.70%
16	Other Asia	\$3,726,700,149.00	1.60%
17	Philippines	\$3,663,395,713.76	1.60%
18	France	\$2,985,969,754.00	1.30%
19	Burma	\$2,832,425,614.00	1.20%
20	Laos	\$2,714,764,139.00	1.20%

MAIN IMPORT COUNTRIES OF THAILAND (As on 2011)			
Serial Number	Country	Value: In US \$	Percentage
1	Japan	\$38,486,184,700.41	18%
2	China	\$30,497,265,591.54	14%
3	United Arab Emirates	\$12,929,468,708.73	6.10%
4	Malaysia	\$12,005,860,403.75	5.70%
5	United States	\$11,181,844,580.36	5.30%
6	Australia	\$9,776,623,591.55	4.60%
7	South Korea	\$9,179,402,645.72	4.30%
8	Switzerland	\$8,804,098,574.61	4.20%
9	Singapore	\$7,097,243,588.89	3.40%
10	Indonesia	\$6,779,613,869.26	3.20%
11	Other Asia	\$6,743,082,625.53	3.20%
12	Saudi Arabia	\$6,584,116,422.12	3.10%
13	Germany	\$4,912,586,976.59	2.30%
14	Russia	\$3,022,070,742.15	1.40%
15	Burma	\$2,979,703,145.13	1.40%
16	Philippines	\$2,712,620,611.45	1.30%
17	Oman	\$2,623,610,724.04	1.20%
18	India	\$2,375,336,812.54	1.10%
19	Qatar	\$2,308,398,054.46	1.10%
20	United Kingdom	\$2,165,636,054.30	1.00%

Source: Observatory of Economic Complexity.

<http://atlas.media.mit.edu/profile/country/tha/> accessed the data on 4/6/2014 at 2:45 pm.

APPENDIX C

List of the Listed Technology Companies in Stock Exchange of Thailand



LIST OF THE LISTED TECHNOLOGY COMPANIES IN STOCK EXCHANGE OF THAILAND		
NUMBER	COMPANY	INDUSTRY
1	Advanced Info Service Public Company Limited	Information and Communication Technology
2	Advanced Information Technology Public Company Limited	Information and Communication Technology
3	Bliss-Tel Public Company Limited	Information and Communication Technology
4	Cal-Comp Electronics (Thailand) Public Company Limited	Electronic Components
5	CS Loxinfo Public Company Limited	Information and Communication Technology
6	Delta Electronics (Thailand) Public Company Limited	Electronic Components
7	Draco PCB Public Company Limited	Electronic Components
8	Total Access Communication Public Company Limited	Information and Communication Technology
9	Electronics Industry Public Company Limited	Electronic Components
10	Forth Corporation Public Company Limited	Information and Communication Technology
11	Hana Microelectronics Public Company Limited	Electronic Components
12	The International Engineering Public Company Limited	Information and Communication Technology
13	Internet Thailand Public Company Limited	Information and Communication Technology
14	Shin Corporation Public Company Limited	Information and Communication Technology
15	Jasmine International Public Company Limited	Information and Communication Technology
16	Jay Mart Public Company Limited	Information and Communication Technology
17	Jasmine Telecom Systems Public Company Limited	Information and Communication Technology
18	KCE Electronics Public Company Limited	Electronic Components
19	Muramoto Electron (Thailand) Public Company	Electronic Components
20	MFEC Public Company Limited	Information and Communication Technology
21	M-Link Asia Corporation Public Company Limited	Information and Communication Technology
22	Metro Systems Corporation Public Company Limited	Information and Communication Technology

23	Premier Technology Public Company Limited	Information and Communication Technology
24	Samart Corporation Public Company Limited	Information and Communication Technology
25	Samart Telcoms Public Company Limited	Information and Communication Technology
26	Samart I-Mobile Public Company Limited	Information and Communication Technology
27	SIS Distribution (Thailand) Public Company Limited	Information and Communication Technology
28	Stars Microelectronics (Thailand) Public Company Limited	Electronic Components
29	Single Point Parts (Thailand) Public Company Limited	Electronic Components
30	SVI Public Company Limited	Electronic Components
31	SVOA Public Company Limited	Information and Communication Technology
32	Symphony Communication Public Company Limited	Information and Communication Technology
33	Synnex (Thailand) Public Company Limited	Information and Communication Technology
34	Team Precision Public Company Limited	Electronic Components
35	Thaicom Public Company Limited	Information and Communication Technology
36	True Corporation Public Company Limited	Information and Communication Technology
37	True Telecommunications Growth Infrastructure Fund	Information and Communication Technology
38	TT and T Public Company Limited	Information and Communication Technology
39	TWZ Corporation Public Company Limited	Information and Communication Technology

APPENDIX D

List of the Satisfied Technology Companies



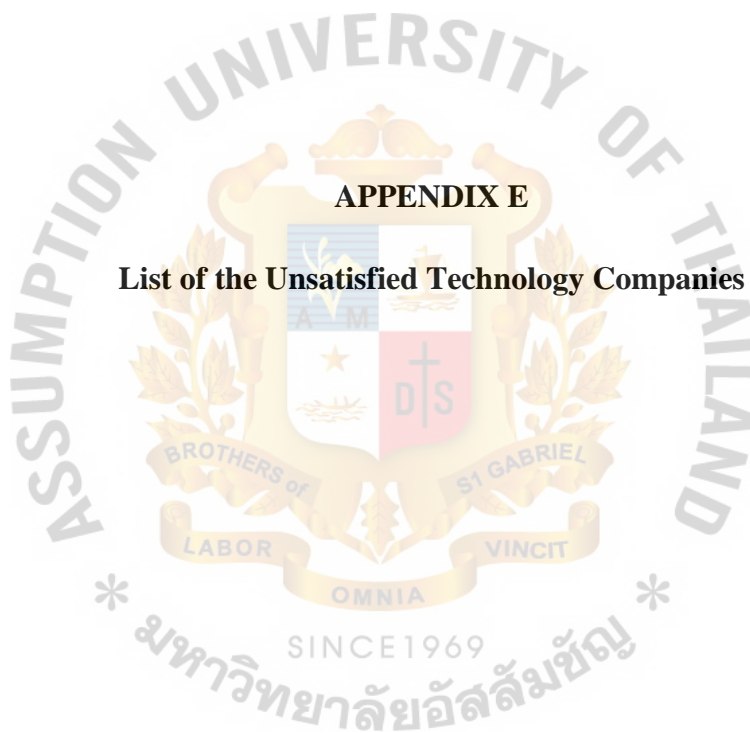
LIST OF THE SATISFIED TECHNOLOGY COMPANIES		
NUMBER	COMPANY	INDUSTRY
1	Advanced Info Service Public Company Limited	Information and Communication Technology
2	Advanced Information Technology Public Company Limited	Information and Communication Technology
3	Bliss-Tel Public Company Limited	Information and Communication Technology
4	Cal-Comp Electronics (Thailand) Public Company Limited	Electronic Components
5	CS Loxinfo Public Company Limited	Information and Communication Technology
6	Delta Electronics (Thailand) Public Company Limited	Electronic Components
7	Draco PCB Public Company Limited	Electronic Components
8	Total Access Communication Public Company Limited	Information and Communication Technology
9	Electronics Industry Public Company Limited	Electronic Components
10	Hana Microelectronics Public Company Limited	Electronic Components
11	The International Engineering Public Company Limited	Information and Communication Technology
12	Internet Thailand Public Company Limited	Information and Communication Technology
13	Jasmine International Public Company Limited	Information and Communication Technology
14	KCE Electronics Public Company Limited	Electronic Components
15	Muramoto Electron (Thailand) Public Company	Electronic Components
16	MFEC Public Company Limited	Information and Communication Technology
17	M-Link Asia Corporation Public Company Limited	Information and Communication Technology
18	Metro Systems Corporation Public Company Limited	Information and Communication Technology
19	Premier Technology Public Company Limited	Information and Communication Technology
20	Samart Corporation Public Company Limited	Information and Communication Technology
21	Samart Telcoms Public Company Limited	Information and Communication Technology
22	Samart I-Mobile Public Company Limited	Information and Communication Technology

23	SIS Distribution (Thailand) Public Company Limited	Information and Communication Technology
24	Single Point Parts (Thailand) Public Company Limited	Electronic Components
25	SVI Public Company Limited	Electronic Components
26	SVOA Public Company Limited	Information and Communication Technology
27	Team Precision Public Company Limited	Electronic Components
28	Thaicom Public Company Limited	Information and Communication Technology
29	True Corporation Public Company Limited	Information and Communication Technology
30	TT and T Public Company Limited	Information and Communication Technology



APPENDIX E

List of the Unsatisfied Technology Companies



LIST OF THE UNSATISFIED TECHNOLOGY COMPANIES		
NUMBER	COMPANY	INDUSTRY
1	Forth Corporation Public Company Limited	Information and Communication Technology
2	Shin Corporation Public Company Limited	Information and Communication Technology
3	Jay Mart Public Company Limited	Information and Communication Technology
4	Jasmine Telecom Systems Public Company Limited	Information and Communication Technology
5	Stars Microelectronics (Thailand) Public Company Limited	Electronic Components
6	Symphony Communication Public Company Limited	Information and Communication Technology
7	Synnex (Thailand) Public Company Limited	Information and Communication Technology
8	True Telecommunications Growth Infrastructure Fund	Information and Communication Technology
9	TWZ Corporation Public Company Limited	Information and Communication Technology



APPENDIX F

List of the Delisted Technology Companies in Stock Exchange of Thailand



LIST OF THE DELISTED TECHNOLOGY COMPANIES IN STOCK EXCHANGE OF THAILAND		
NUMBER	COMPANY	INDUSTRY
1	GSS Array Technology Public Company Limited	Electronic Components
2	Hipro Electronic Public Company Limited	Electronic Components
3	United Communication Industry Public Company Limited	Information and Communication Technology
4	Magnecomp Precision Technology Public Company Limited	Electronic Components
5	Union Technology (2008) Public Company Limited	Information and Communication Technology





APPENDIX G

SPSS Output

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	300	-186.54	79.42	3.1944	20.32327
ROE	300	-3249.68	651.06	-2.3625	205.13245
ASSETS	300	18.28	25.92	22.3598	1.62919
CAPITAL	300	18.07	25.47	22.0673	1.65802
DEBT	300	.00	25.34	19.2311	5.88674
LIQUIDITY	300	-11270.33	3170.15	13.1310	1017.18331
GDP	300	-2.30	7.80	4.2700	3.08054
INFLATION	300	-.80	5.48	3.0780	1.68863
Valid N (listwise)	300				

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.201 ^a	.040	.027	20.04206

a. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5000.754	4	1250.188	3.112	.016 ^b
	Residual	118496.809	295	401.684		
	Total	123497.563	299			

a. Dependent Variable: ROA

b. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-35.456	16.516		-2.147	.033
	ASSETS	-.403	3.405	-.032	-.118	.906
	CAPITAL	2.673	3.316	.218	.806	.421
	DEBT	-.590	.224	-.171	-2.633	.009
	LIQUIDITY	.002	.001	.079	1.389	.166

a. Dependent Variable: ROA

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.152 ^a	.023	.016	20.15499

a. Predictors: (Constant), INFLATION, GDP

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2849.129	2	1424.565	3.507	.031 ^b
	Residual	120648.433	297	406.224		
	Total	123497.563	299			

a. Dependent Variable: ROA

b. Predictors: (Constant), INFLATION, GDP

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.132	2.629		1.191	.234
	GDP	.952	.397	.144	2.399	.017
	INFLATION	-1.301	.724	-.108	-1.796	.074

a. Dependent Variable: ROA

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.113 ^a	.013	-.001	205.19552

a. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	160682.269	4	40170.567	.954	.433 ^b
	Residual	12421034.802	295	42105.203		
	Total	12581717.070	299			

a. Dependent Variable: ROE

b. Predictors: (Constant), LIQUIDITY, CAPITAL, DEBT, ASSETS

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-319.424	169.094		
	ASSETS	13.210	34.858	.105	.379
	CAPITAL	2.910	33.953	.024	.932
	DEBT	-2.212	2.293	-.063	.335
	LIQUIDITY	.000	.012	.002	.972

a. Dependent Variable: ROE

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.108 ^a	.012	.005	204.60987

a. Predictors: (Constant), INFLATION, GDP

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	147752.876	2	73876.438	1.765
	Residual	12433964.194	297	41865.199	.173 ^b
	Total	12581717.070	299		

a. Dependent Variable: ROE

b. Predictors: (Constant), INFLATION, GDP

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-3.562	26.685		
	GDP	6.910	4.030	.104	.087
	INFLATION	-9.196	7.352	-.076	.212

a. Dependent Variable: ROE



APPENDIX H

Data for each Company

ADVANCED INFO SERVICE PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	124,949,175,850	121,167,600,011	119,013,888,068	134,300,773,962	128,941,651,810	128,081,288,837	125,025,725,238	97,347,775,737	86,672,318,917	100,967,897,188
Capital	102,898,660,506	98,027,744,257	96,896,994,162	111,271,703,375	106,170,895,530	110,734,090,211	109,168,999,373	77,551,394,491	61,837,902,746	64,401,150,350
Debt (Loan)	43,272,456,826	29,940,576,502	25,815,873,511	33,672,694,887	30,710,095,658	37,298,445,292	37,357,980,379	36,360,277,700	22,374,349,804	20,859,299,047
Liquidity	197.83%	-9.25%	147.38%	61.64%	70.41%	-35.28%	-377.44%	90.63%	-25.55%	-13.11%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	14.83%	16.72%	15.89%	12.10%	12.63%	12.85%	13.43%	21.19%	25.78%	34.56%
ROE	31.08%	29.75%	26.60%	20.95%	21.59%	22.42%	23.38%	50.09%	56.62%	80.15%
Ln (Natural Log)										
Assets	25.55	25.52	25.50	25.62	25.58	25.58	25.55	25.30	25.19	25.34
Capital	25.36	25.31	25.30	25.44	25.39	25.43	25.42	25.07	24.85	24.89
Debt (Loan)	24.49	24.12	23.97	24.24	24.15	24.34	24.34	24.32	23.83	23.76

ADVANCED INFORMATION TECHNOLOGY PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	1,320,504,654	1,269,699,424	1,437,311,921	1,580,832,300	1,272,549,074	1,695,747,340	1,944,205,009	2,397,326,262	2,735,517,612	3,673,825,143
Capital	905,337,718	935,583,693	1,067,433,268	1,086,695,443	868,047,379	1,272,554,194	1,025,772,143	1,266,597,726	1,464,640,192	1,882,727,736
Debt (Loan)	323,364,958	326,382,717	429,766,590	321,853,905	55,522,409	398,883,905	0	0	75,000,000	436,216,051
Liquidity	98.97%	74.29%	40.49%	53.42%	95.43%	76.88%	134.38%	125.75%	116.36%	91.37%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	8.87%	5.92%	4.76%	12.47%	7.32%	12.33%	15.95%	16.20%	16.05%	10.00%
ROE	20.13%	12.35%	10.74%	25.78%	11.47%	23.94%	30.24%	30.67%	31.58%	25.39%
Ln (Natural Log)										
Assets	21.00	20.96	21.09	21.18	20.96	21.25	21.39	21.60	21.73	22.02
Capital	20.62	20.66	20.79	20.81	20.58	20.96	20.75	20.96	21.10	21.36
Debt (Loan)	19.59	19.60	19.88	19.59	17.83	19.80	0	0	18.13	19.89

BLISS-TEL PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	1,416,687,616	1,716,942,127	2,135,866,236	1,272,145,931	1,738,747,642	504,755,073	342,731,850	271,770,800	217,518,717	86,663,583
Capital	1,341,599,240	1,648,484,289	2,022,057,990	1,239,674,269	1,570,239,191	357,988,276	266,676,423	160,716,340	157,995,128	70,721,401
Debt (Loan)	1,006,177,283	787,055,648	1,114,848,701	844,788,609	599,682,434	329,013,669	254,268,759	77,692,321	89,629,755	52,734,949
Liquidity	21.23%	53.15%	40.94%	23.32%	147.18%	-222.21%	-24.20%	109.47%	36.16%	219.52%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	5.05%	7.56%	5.37%	-35.86%	20.36%	-186.54%	-27.81%	17.89%	-29.56%	-58.16%
ROE	21.34%	15.06%	12.65%	-115.53%	36.48%	-3249.68%	-768.21%	58.56%	-94.04%	-280.23%
Ln (Natural Log)										
Assets	21.07	21.26	21.48	20.96	21.28	20.04	19.65	19.42	19.20	18.28
Capital	21.02	21.22	21.43	20.94	21.17	19.70	19.40	18.90	18.88	18.07
Debt (Loan)	20.73	20.48	20.83	20.55	20.21	19.61	19.35	18.17	18.31	17.78

CAL-COMP ELECTRONICS (THAILAND) PUBLIC COMPANY LIMITED AND ITS SUBSIDIARY COMPANIES										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	15,897,224,682	26,229,654,001	25,987,482,931	33,530,497,640	44,430,243,570	59,487,991,060	46,604,777,486	56,300,917,922	56,412,322,092	57,505,351,361
Capital	11,556,681,114	16,214,194,117	16,229,735,418	16,222,564,860	22,647,147,590	29,574,888,246	24,784,306,095	28,831,400,968	29,931,307,325	32,649,184,880
Debt (Loan)	4,649,737,776	7,921,995,365	5,907,547,922	3,626,988,175	8,711,284,268	14,663,629,768	8,847,485,696	12,033,541,448	15,362,429,740	17,367,515,791
Liquidity	59.65%	55.86%	81.52%	87.96%	51.41%	28.87%	54.67%	49.82%	21.75%	0.50%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	9.34%	6.87%	6.78%	7.25%	6.53%	3.58%	2.79%	2.94%	1.93%	2.08%
ROE	21.50%	21.73%	17.07%	19.29%	20.82%	14.27%	8.17%	9.85%	7.46%	7.85%
Ln (Natural Log)										
Assets	23.49	23.99	23.98	24.24	24.52	24.81	24.56	24.75	24.76	24.78
Capital	23.17	23.51	23.51	23.51	23.84	24.11	23.93	24.08	24.12	24.21
Debt (Loan)	22.26	22.79	22.50	22.01	22.89	23.41	22.90	23.21	23.46	23.58

CSL PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	1,004,839,254	2,561,359,645	3,012,360,239	2,615,245,974	2,368,294,451	2,196,391,380	1,982,734,036	2,010,162,172	2,008,945,668	2,134,422,658
Capital	641,745,334	1,905,361,463	2,275,849,102	1,932,435,194	1,642,936,529	1,290,344,575	1,360,489,946	1,398,074,805	1,296,109,204	1,223,006,607
Debt (Loan)	72,316,178	6,031,604	117,364,587	124,000,352	17,813,210	346,026,134	312,324,881	242,659,849	161,077,993	85,275,213
Liquidity	-219.86%	-2241.46%	-286.36%	-280.53%	-181.47%	1.97%	-107.95%	-223.72%	-93.22%	-52.58%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	7.78%	12.82%	6.52%	8.13%	11.01%	7.48%	14.57%	19.97%	16.53%	17.95%
ROE	13.74%	17.28%	9.10%	11.76%	16.04%	17.40%	27.57%	34.74%	29.25%	33.67%
Ln (Natural Log)										
Assets	20.73	21.66	21.83	21.68	21.59	21.51	21.41	21.42	21.42	21.48
Capital	20.28	21.37	21.55	21.38	21.22	20.98	21.03	21.06	20.98	20.92
Debt (Loan)	18.10	15.61	18.58	18.64	16.70	19.66	19.56	19.31	18.90	18.26

DELTA ELECTRONICS (THAILAND) PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	29,352,084,957	28,181,059,057	27,497,300,004	26,198,812,059	26,254,715,824	26,883,165,095	27,084,958,355	29,610,508,319	29,898,815,809	33,074,665,566
Capital	18,105,078,048	17,525,695,092	17,484,034,893	16,488,665,300	17,898,706,782	19,245,071,360	19,109,770,872	20,511,583,999	20,881,234,785	23,157,326,529
Debt (Loan)	4,785,261,945	4,111,862,726	2,463,662,264	1,903,592,788	2,023,200,101	2,399,138,432	1,461,549,680	1,214,076,785	1,022,144,521	660,694,307
Liquidity	186.33%	145.65%	244.16%	196.99%	275.13%	238.39%	362.16%	237.14%	255.85%	383.56%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	6.46%	4.36%	8.31%	7.49%	12.02%	10.78%	8.08%	14.12%	9.58%	13.14%
ROE	14.24%	9.16%	15.21%	13.45%	19.87%	17.20%	12.41%	21.66%	14.42%	19.32%
Ln (Natural Log)										
Assets	24.10	24.06	24.04	23.99	23.99	24.01	24.02	24.11	24.12	24.22
Capital	23.62	23.59	23.58	23.53	23.61	23.68	23.67	23.74	23.76	23.87
Debt (Loan)	22.29	22.14	21.62	21.37	21.43	21.60	21.10	20.92	20.75	20.31

DRACO PCB PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	870,783,418	944,078,006	928,031,979	945,896,740	1,093,827,417	998,638,769	1,097,513,027	1,175,806,167	1,199,029,346	1,379,483,117
Capital	806,236,861	858,692,864	796,869,236	809,790,411	916,645,423	884,865,331	949,230,146	910,612,289	976,102,996	1,187,226,093
Debt (Loan)	141,370,200	180,679,828	122,380,124	112,158,860	117,905,849	34,925,824	85,812,680	12,032,041	54,744,374	31,323,678
Liquidity	110.47%	93.13%	99.14%	92.83%	115.70%	149.16%	166.14%	151.56%	229.46%	135.37%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	6.91%	2.90%	0.88%	3.30%	10.34%	9.39%	3.39%	4.59%	4.15%	-1.91%
ROE	9.05%	4.04%	1.20%	4.47%	14.16%	11.03%	4.31%	6.01%	5.40%	-2.28%
Ln (Natural Log)										
Assets	20.58	20.67	20.65	20.67	20.81	20.72	20.82	20.89	20.90	21.04
Capital	20.51	20.57	20.50	20.51	20.64	20.60	20.67	20.63	20.70	20.89
Debt (Loan)	18.77	19.01	18.62	18.54	18.59	17.37	18.27	16.30	17.82	17.26

TOTAL ACCESS COMMUNICATION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	82,317,772,272	83,052,157,128	87,049,218,438	95,086,097,833	100,862,217,964	104,434,764,534	100,530,181,591	99,313,151,997	103,846,858,968	101,018,316,338
Capital	74,796,515,201	74,209,561,261	76,837,320,297	81,236,054,703	83,680,433,464	89,587,534,721	82,762,939,115	78,796,881,114	77,847,768,522	65,212,574,759
Debt (Loan)	45,515,505,146	40,458,782,065	40,318,366,421	39,779,554,670	31,814,401,904	30,096,682,721	20,215,294,817	9,919,130,664	42,960,076,423	30,268,659,229
Liquidity	207.40%	231.97%	487.69%	201.50%	154.41%	181.83%	112.70%	13.21%	206.09%	122.54%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	7.91%	10.74%	5.30%	5.19%	5.79%	8.93%	6.58%	10.96%	11.37%	11.16%
ROE	22.23%	26.43%	12.63%	11.91%	11.26%	15.68%	10.57%	15.80%	33.86%	32.27%
Ln (Natural Log)										
Assets	25.13	25.14	25.19	25.28	25.34	25.37	25.33	25.32	25.37	25.34
Capital	25.04	25.03	25.06	25.12	25.15	25.22	25.14	25.09	25.08	24.90
Debt (Loan)	24.54	24.42	24.42	24.41	24.18	24.13	23.73	23.02	24.48	24.13

ELECTRONICS INDUSTRY PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	680,339,902	741,295,144	662,965,975	652,916,862	703,781,525	699,826,534	638,391,531	633,888,922	620,284,948	619,077,536
Capital	621,854,630	644,591,716	632,818,498	627,827,753	671,355,488	687,781,431	622,451,224	625,782,066	601,149,071	599,941,660
Debt (Loan)	20,000,000	0	0	0	0	4,000,000	0	0	0	0
Liquidity	177.79%	181.88%	153.78%	117.80%	104.44%	102.61%	112.11%	106.04%	115.84%	116.36%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	9.59%	9.22%	5.32%	2.78%	7.44%	7.36%	-4.59%	1.51%	-0.90%	-1.09%
ROE	10.85%	10.60%	5.58%	2.89%	7.80%	7.54%	-4.70%	1.53%	-0.93%	-1.13%
Ln (Natural Log)										
Assets	20.34	20.42	20.31	20.30	20.37	20.37	20.27	20.27	20.25	20.24
Capital	20.25	20.28	20.27	20.26	20.32	20.35	20.25	20.25	20.21	20.21
Debt (Loan)	16.81	0.00	0.00	0.00	0.00	15.20	0.00	0.00	0.00	0.00

HANA MICROELECTRONICS PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	8,473,484,490	9,506,063,416	11,356,840,710	12,346,757,104	13,773,451,573	14,311,611,020	15,810,900,600	16,803,935,425	17,911,712,470	17,921,374,771
Capital	6,939,287,219	7,948,241,033	9,055,453,941	9,871,638,317	11,290,848,356	12,397,477,995	13,050,192,352	14,078,536,185	14,603,399,957	14,954,188,109
Debt (Loan)	0	0	0	0	0	0	43,906,080	0	38,820,547	24,435,471
Liquidity	369.29%	265.68%	301.05%	179.89%	242.65%	359.06%	535.22%	309.30%	320.94%	278.37%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	19.05%	19.50%	18.15%	17.95%	17.78%	13.34%	12.92%	16.36%	9.03%	9.27%
ROE	23.27%	23.32%	22.77%	22.45%	21.69%	15.40%	15.71%	19.53%	11.11%	11.12%
Ln (Natural Log)										
Assets	22.86	22.98	23.15	23.24	23.35	23.38	23.48	23.54	23.61	23.61
Capital	22.66	22.80	22.93	23.01	23.15	23.24	23.29	23.37	23.40	23.43
Debt (Loan)	0.00	0.00	0.00	0.00	0.00	0.00	17.60	0.00	17.47	17.01

THE INTERNATIONAL ENGINEERING PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	2,213,655,880	2,214,060,730	2,417,053,587	2,333,477,386	2,986,185,756	2,332,608,959	2,166,742,636	1,686,157,917	1,452,359,383	1,489,881,986
Capital	1,362,323,466	1,284,477,941	2,076,000,086	2,012,662,394	2,439,236,540	1,640,078,729	1,529,388,332	1,005,516,784	1,120,866,881	674,983,086
Debt (Loan)	226,528,232	215,879,180	121,503,757	235,950,866	469,447,993	583,616,898	590,328,986	677,036,508	1,037,991,828	436,285,133
Liquidity	94.95%	94.48%	177.14%	115.63%	1539.34%	-39.97%	-3.32%	-1302.21%	1394.29%	-119.12%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	-7.08%	-4.24%	-10.08%	-42.07%	6.28%	-50.25%	-26.40%	-54.63%	-22.10%	-19.38%
ROE	-13.80%	-8.79%	-12.47%	-55.25%	9.52%	-110.94%	-60.91%	-280.43%	-387.24%	-120.97%
Ln (Natural Log)										
Assets	21.52	21.52	21.61	21.57	21.82	21.57	21.50	21.25	21.10	21.12
Capital	21.03	20.97	21.45	21.42	21.61	21.22	21.15	20.73	20.84	20.33
Debt (Loan)	19.24	19.19	18.62	19.28	19.97	20.18	20.20	20.33	20.76	19.89

INTERNET THAILAND PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	807,732,256	851,612,201	842,056,418	854,372,621	830,203,115	840,879,358	785,321,690	722,875,098	636,433,970	625,895,730
Capital	662,514,947	674,822,009	668,910,153	654,647,446	646,673,878	611,243,029	610,952,832	585,710,437	490,135,577	490,060,790
Debt (Loan)	10,605,272	6,028,142	5,276,991	2,215,923	1,032,723	0	0	0	0	0
Liquidity	-3247.00%	1303.65%	206.83%	125.42%	190.80%	248.66%	1334.43%	-11152.95%	-348.98%	-638.07%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	11.70%	10.79%	8.58%	1.03%	-0.22%	-3.50%	1.55%	-1.76%	-13.14%	-0.30%
ROE	14.50%	13.74%	10.88%	1.35%	-0.28%	-4.81%	2.00%	-2.17%	-17.07%	-0.39%
Ln (Natural Log)										
Assets	20.51	20.56	20.55	20.57	20.54	20.55	20.48	20.40	20.27	20.25
Capital	20.31	20.33	20.32	20.30	20.29	20.23	20.23	20.19	20.01	20.01
Debt (Loan)	16.18	15.61	15.48	14.61	13.85	0.00	0.00	0.00	0.00	0.00

JASMINE INTERNATIONAL PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	16,202,767,207	17,076,628,204	16,600,614,551	17,440,071,183	14,979,427,179	12,328,608,620	15,944,667,137	19,301,747,378	19,567,250,867	19,400,465,477
Capital	14,624,886,543	14,893,925,882	15,019,725,741	16,276,927,597	13,012,002,053	9,715,962,905	12,142,875,839	14,078,734,733	15,028,416,218	14,981,470,545
Debt (Loan)	9,194,879,536	7,426,218,795	6,532,810,729	6,869,757,872	4,174,821,251	3,764,829,494	5,483,242,458	6,696,495,485	6,928,841,784	5,270,101,721
Liquidity	398.97%	839.01%	333.70%	329.14%	512.56%	106.47%	35.88%	-63.89%	-208.15%	205.08%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	26.19%	6.67%	5.21%	1.35%	0.15%	-9.63%	1.42%	3.05%	5.34%	10.61%
ROE	78.15%	15.26%	10.19%	2.51%	0.25%	-19.96%	3.40%	7.98%	12.91%	21.19%
Ln (Natural Log)										
Assets	23.51	23.56	23.53	23.58	23.43	23.24	23.49	23.68	23.70	23.69
Capital	23.41	23.42	23.43	23.51	23.29	23.00	23.22	23.37	23.43	23.43
Debt (Loan)	22.94	22.73	22.60	22.65	22.15	22.05	22.42	22.62	22.66	22.39

KCE ELECTRONICS PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	6,991,326,365	8,689,930,073	8,873,106,306	9,115,572,683	9,876,964,647	9,384,641,474	8,807,773,100	8,752,911,629	9,278,123,842	10,255,567,438
Capital	5,805,336,624	7,459,819,763	7,496,711,866	7,468,997,686	7,956,203,677	8,032,461,700	7,686,040,621	7,588,828,578	7,747,145,253	8,608,362,838
Debt (Loan)	3,720,606,295	5,063,285,468	5,096,695,162	5,185,722,636	5,246,110,997	5,722,220,643	5,207,476,913	4,944,047,255	5,238,953,718	5,531,134,600
Liquidity	-65.41%	-57.88%	-74.69%	-128.13%	-122.58%	-213.94%	-116.17%	-99.07%	-21.05%	-44.14%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	4.28%	2.77%	0.02%	-1.28%	2.82%	-4.18%	1.98%	6.21%	1.39%	6.99%
ROE	14.35%	10.05%	0.06%	-5.10%	10.28%	-16.99%	7.03%	20.55%	5.14%	23.28%
Ln (Natural Log)										
Assets	22.67	22.89	22.91	22.93	23.01	22.96	22.90	22.89	22.95	23.05
Capital	22.48	22.73	22.74	22.73	22.80	22.81	22.76	22.75	22.77	22.88
Debt (Loan)	22.04	22.35	22.35	22.37	22.38	22.47	22.37	22.32	22.38	22.43

MURAMOTO ELECTRON (THAILAND) PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	7,185,587,205	8,147,141,059	8,501,139,597	9,354,530,165	8,879,761,622	9,714,838,738	8,696,931,778	9,959,231,420	8,652,007,833	8,156,345,952
Capital	4,387,847,235	5,034,493,820	5,461,595,839	6,247,904,851	6,562,952,794	6,819,863,895	6,422,354,798	6,929,648,780	6,608,964,470	5,960,609,658
Debt (Loan)	575,942,611	413,561,032	239,206,353	809,750,754	688,090,282	566,400,600	424,557,383	308,433,547	44,421,557	121,983,567
Liquidity	172.48%	163.34%	167.96%	190.65%	279.40%	309.82%	234.66%	230.90%	252.35%	143.40%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	12.61%	13.71%	11.09%	5.36%	7.15%	6.16%	0.46%	7.66%	3.45%	-5.97%
ROE	23.78%	24.17%	18.05%	9.23%	10.80%	9.57%	0.67%	11.52%	4.55%	-8.34%
Ln (Natural Log)										
Assets	22.70	22.82	22.86	22.96	22.91	23.00	22.89	23.02	22.88	22.82
Capital	22.20	22.34	22.42	22.56	22.60	22.64	22.58	22.66	22.61	22.51
Debt (Loan)	20.17	19.84	19.29	20.51	20.35	20.15	19.87	19.55	17.61	18.62

MFEC PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	620,267,824	1,031,185,971	957,608,830	1,291,302,590	1,473,670,284	1,760,816,506	2,019,515,546	2,121,102,496	3,880,605,702	3,691,037,535
Capital	501,154,229	657,780,144	631,575,842	774,638,231	928,985,723	1,065,999,587	1,273,414,961	1,378,891,496	2,986,114,715	2,345,217,162
Debt (Loan)	85,764,313	157,997,354	61,820,263	185,024,704	293,724,694	344,658,295	530,891,454	545,057,040	1,298,156,322	616,013,813
Liquidity	190.82%	74.26%	93.59%	76.66%	72.02%	70.57%	56.81%	58.08%	34.30%	61.67%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	11.33%	13.05%	8.02%	7.74%	8.30%	7.70%	5.21%	3.30%	5.26%	4.96%
ROE	16.92%	26.93%	13.47%	16.96%	19.25%	18.80%	14.17%	8.40%	12.09%	10.60%
Ln (Natural Log)										
Assets	20.25	20.75	20.68	20.98	21.11	21.29	21.43	21.48	22.08	22.03
Capital	20.03	20.30	20.26	20.47	20.65	20.79	20.96	21.04	21.82	21.58
Debt (Loan)	18.27	18.88	17.94	19.04	19.50	19.66	20.09	20.12	20.98	20.24

M-LINK ASIA CORPORATION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	1,576,312,449	2,555,124,929	3,659,381,193	4,047,774,349	3,776,231,478	4,178,294,319	4,114,429,813	4,403,854,517	2,287,197,557	1,211,539,604
Capital	1,409,520,845	2,270,998,949	3,497,930,325	3,894,768,380	3,541,779,562	3,729,136,018	3,793,474,454	3,954,648,527	1,761,112,156	1,028,533,837
Debt (Loan)	786,700,002	930,000,000	2,165,936,100	2,521,730,400	2,021,629,163	2,163,629,163	2,112,935,183	2,261,427,730	2,575,554,219	880,738,329
Liquidity	24.43%	16.06%	26.74%	28.14%	-2.76%	-21.53%	-110.18%	-227.38%	-2037.07%	21.95%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	-7.83%	6.98%	4.92%	1.66%	3.88%	3.01%	2.94%	1.51%	-108.62%	79.42%
ROE	-19.81%	13.30%	13.50%	4.90%	9.63%	8.04%	7.19%	3.93%	305.03%	651.06%
Ln (Natural Log)										
Assets	21.18	21.66	22.02	22.12	22.05	22.15	22.14	22.21	21.55	20.92
Capital	21.07	21.54	21.98	22.08	21.99	22.04	22.06	22.10	21.29	20.75
Debt (Loan)	20.48	20.65	21.50	21.65	21.43	21.50	21.47	21.54	21.67	20.60

METRO SYSTEMS CORPORATION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	2,560,846,613	2,473,253,556	2,416,517,117	2,075,296,052	2,048,418,454	2,119,383,253	2,004,913,916	2,264,878,601	2,460,611,573	2,495,207,825
Capital	1,767,954,844	1,539,791,340	1,582,120,532	1,367,836,701	1,347,922,111	1,404,597,895	1,273,268,694	1,549,506,040	1,381,219,785	1,541,112,486
Debt (Loan)	1,031,966,954	742,539,664	622,761,461	321,785,579	261,816,493	267,889,748	138,988,892	326,662,275	196,377,227	225,349,965
Liquidity	-32.99%	14.03%	38.15%	83.02%	76.05%	136.72%	96.92%	74.23%	96.58%	99.66%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	2.61%	3.67%	7.16%	-10.20%	7.76%	6.53%	3.47%	5.57%	4.32%	8.90%
ROE	9.08%	11.39%	18.04%	-20.24%	14.63%	12.17%	6.14%	10.31%	8.98%	16.87%
Ln (Natural Log)										
Assets	21.66	21.63	21.61	21.45	21.44	21.47	21.42	21.54	21.62	21.64
Capital	21.29	21.15	21.18	21.04	21.02	21.06	20.96	21.16	21.05	21.16
Debt (Loan)	20.75	20.43	20.25	19.59	19.38	19.41	18.75	19.60	19.10	19.23

PREMIER TECHNOLOGY PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	733,509,738	729,473,284	542,556,515	836,691,820	732,096,992	798,558,950	717,540,626	890,292,928	1,236,482,648	1,508,408,001
Capital	291,894,370	336,429,593	240,463,042	284,992,163	281,108,116	339,290,957	364,749,437	415,557,289	482,794,944	586,760,778
Debt (Loan)	319,118,297	323,150,533	126,198,793	98,919,604	84,529,800	97,030,202	126,676,890	146,288,025	226,657,376	271,335,776
Liquidity	320.04%	-177.11%	-20.05%	209.33%	63.63%	122.74%	90.44%	100.00%	100.00%	100.00%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	-7.04%	-7.33%	20.56%	7.72%	3.37%	3.76%	-0.97%	3.19%	4.15%	4.87%
ROE	189.57%	-402.90%	97.60%	34.73%	12.57%	12.39%	-2.94%	10.54%	20.04%	23.30%
Ln (Natural Log)										
Assets	20.41	20.41	20.11	20.54	20.41	20.50	20.39	20.61	20.94	21.13
Capital	19.49	19.63	19.30	19.47	19.45	19.64	19.71	19.85	20.00	20.19
Debt (Loan)	19.58	19.59	18.65	18.41	18.25	18.39	18.66	18.80	19.24	19.42

SAMART CORPORATION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	10,048,868,163	12,029,372,514	13,027,654,005	14,263,077,083	13,116,834,013	13,274,729,930	15,518,509,377	13,529,310,274	18,351,580,334	21,117,580,647
Capital	8,114,674,658	9,043,899,223	10,670,688,602	10,730,381,502	11,036,028,677	11,592,905,233	13,018,047,209	11,428,074,199	14,569,540,091	16,406,320,294
Debt (Loan)	4,969,287,066	5,178,110,646	6,491,648,577	5,660,873,216	5,968,921,156	6,916,132,929	8,050,732,311	5,819,341,083	8,574,167,487	9,532,640,411
Liquidity	81.35%	45.94%	13.60%	45.90%	42.10%	25.67%	15.82%	29.62%	19.31%	17.24%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	17.81%	4.54%	4.48%	13.95%	5.47%	2.76%	3.55%	5.93%	6.06%	6.44%
ROE	56.91%	14.14%	13.97%	39.26%	14.15%	7.84%	11.10%	14.31%	18.54%	19.79%
Ln (Natural Log)										
Assets	23.03	23.21	23.29	23.38	23.30	23.31	23.47	23.33	23.63	23.77
Capital	22.82	22.93	23.09	23.10	23.12	23.17	23.29	23.16	23.40	23.52
Debt (Loan)	22.33	22.37	22.59	22.46	22.51	22.66	22.81	22.48	22.87	22.98

SAMART TELCOMS PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	2,066,473,415	1,871,746,276	4,018,156,524	3,384,209,492	3,234,934,179	3,556,352,885	5,991,262,705	4,578,749,761	8,850,942,494	12,338,174,471
Capital	1,899,389,902	1,578,666,329	3,307,796,779	2,697,218,848	2,663,421,900	3,040,676,481	4,719,895,667	3,537,585,152	6,478,008,716	9,281,648,451
Debt (Loan)	562,620,967	123,492,128	2,108,289,641	1,340,941,069	1,388,984,057	1,684,197,034	3,144,465,262	1,723,044,926	4,242,851,660	6,578,111,132
Liquidity	-33.98%	79.72%	20.07%	26.99%	18.64%	12.00%	-5.25%	11.27%	8.91%	-0.85%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	4.37%	9.12%	6.18%	9.79%	3.46%	3.15%	4.98%	8.80%	8.94%	6.56%
ROE	6.76%	11.73%	20.69%	24.43%	8.79%	8.26%	18.95%	22.20%	35.40%	29.95%
Ln (Natural Log)										
Assets	21.45	21.35	22.11	21.94	21.90	21.99	22.51	22.24	22.90	23.24
Capital	21.36	21.18	21.92	21.72	21.70	21.84	22.28	21.99	22.59	22.95
Debt (Loan)	20.15	18.63	21.47	21.02	21.05	21.24	21.87	21.27	22.17	22.61

SAMART I-MOBILE PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	3,649,395,287	4,938,881,292	4,582,840,855	7,087,242,895	6,273,687,154	6,252,450,939	6,138,977,532	5,434,034,375	5,699,481,171	5,442,265,379
Capital	2,666,265,591	3,148,551,427	3,834,885,673	4,581,693,249	4,663,600,463	5,406,005,692	5,208,981,857	4,773,739,354	4,790,360,384	4,359,969,174
Debt (Loan)	796,439,673	979,307,483	1,629,597,190	2,135,485,279	2,182,143,804	3,115,935,936	2,844,863,893	2,355,389,923	2,386,965,601	1,813,684,821
Liquidity	112.41%	70.21%	44.46%	43.27%	47.23%	29.51%	35.01%	42.47%	38.75%	50.76%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	6.56%	8.65%	8.20%	6.89%	4.84%	1.36%	1.71%	2.49%	1.50%	3.06%
ROE	12.81%	19.70%	17.04%	19.95%	12.23%	3.70%	4.44%	5.60%	3.55%	6.54%
Ln (Natural Log)										
Assets	22.02	22.32	22.25	22.68	22.56	22.56	22.54	22.42	22.46	22.42
Capital	21.70	21.87	22.07	22.25	22.26	22.41	22.37	22.29	22.29	22.20
Debt (Loan)	20.50	20.70	21.21	21.48	21.50	21.86	21.77	21.58	21.59	21.32

SIS DISTRIBUTION (THAILAND) PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	1,444,684,626	1,848,696,111	2,346,451,100	2,080,404,588	1,778,509,117	2,143,192,104	2,983,264,310	3,473,187,431	6,018,772,000	4,573,390,000
Capital	1,066,563,163	1,211,056,421	1,434,754,102	1,511,812,726	1,163,919,974	1,321,712,911	1,909,041,013	2,222,370,960	3,525,068,000	3,127,646,000
Debt (Loan)	907,680,292	794,947,129	943,671,246	946,310,578	497,020,474	493,035,431	909,746,944	980,280,171	2,245,505,000	2,611,481,000
Liquidity	-39.43%	11.85%	12.85%	20.15%	57.75%	64.24%	49.08%	51.61%	33.69%	11.46%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	3.02%	4.08%	3.76%	4.47%	7.29%	9.64%	8.10%	8.50%	2.38%	-16.15%
ROE	27.47%	18.12%	17.95%	16.44%	19.43%	24.93%	24.19%	23.77%	11.22%	-143.11%
Ln (Natural Log)										
Assets	21.09	21.34	21.58	21.46	21.30	21.49	21.82	21.97	22.52	22.24
Capital	20.79	20.91	21.08	21.14	20.88	21.00	21.37	21.52	21.98	21.86
Debt (Loan)	20.63	20.49	20.67	20.67	20.02	20.02	20.63	20.70	21.53	21.68

SINGLE POINT PARTS (THAILAND) PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	253,344,687	430,270,490	572,908,879	658,719,570	811,390,228	897,815,052	709,268,520	778,695,706	543,885,964	842,936,681
Capital	205,611,738	304,339,029	499,964,611	566,263,725	661,352,266	756,484,072	638,557,125	690,665,320	418,004,247	781,100,059
Debt (Loan)	7,051,474	22,133,165	12,838,871	798,186	90,214,658	196,144,179	51,196,187	65,322,241	40,673,048	241,223,414
Liquidity	108.82%	86.88%	179.42%	185.74%	76.87%	22.14%	119.22%	132.10%	805.46%	58.70%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	28.25%	23.04%	28.50%	24.68%	10.56%	6.36%	8.20%	10.82%	-36.91%	40.84%
ROE	36.05%	35.13%	33.52%	28.75%	15.00%	10.20%	9.90%	13.48%	-53.20%	63.77%
Ln (Natural Log)										
Assets	19.35	19.88	20.17	20.31	20.51	20.62	20.38	20.47	20.11	20.55
Capital	19.14	19.53	20.03	20.15	20.31	20.44	20.27	20.35	19.85	20.48
Debt (Loan)	15.77	16.91	16.37	13.59	18.32	19.09	17.75	17.99	17.52	19.30

SVI PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	2,061,172,384	2,643,159,785	2,688,052,304	3,125,928,420	3,624,427,863	4,556,337,024	3,984,614,354	5,612,547,789	3,954,061,588	4,931,537,270
Capital	1,513,399,988	1,947,675,398	2,036,604,858	2,243,426,185	2,629,995,211	3,295,328,366	2,531,511,969	3,719,976,162	1,879,658,949	3,166,853,237
Debt (Loan)	9,891,165	295,911,794	125,260,156	87,648,722	151,225,525	238,816,179	559,261,713	874,232,264	629,233,169	649,988,558
Liquidity	116.16%	89.90%	122.54%	98.17%	131.38%	158.11%	147.60%	160.00%	-283.55%	122.21%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	8.73%	6.94%	9.55%	9.42%	10.60%	14.20%	14.61%	13.10%	-32.24%	25.28%
ROE	11.97%	11.11%	13.43%	13.66%	15.49%	21.17%	29.51%	25.83%	-101.96%	49.52%
Ln (Natural Log)										
Assets	21.45	21.70	21.71	21.86	22.01	22.24	22.11	22.45	22.10	22.32
Capital	21.14	21.39	21.43	21.53	21.69	21.92	21.65	22.04	21.35	21.88
Debt (Loan)	16.11	19.51	18.65	18.29	18.83	19.29	20.14	20.59	20.26	20.29

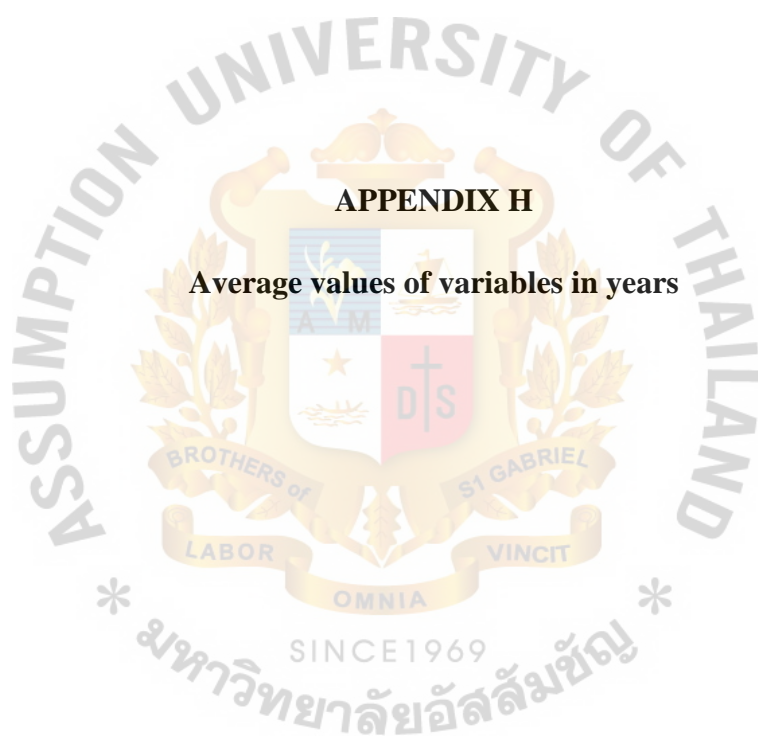
SVOA PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	2,361,239,810	2,449,110,294	2,806,842,066	2,658,659,300	3,575,767,802	3,328,970,783	4,194,642,224	4,469,589,170	5,575,185,072	5,835,391,406
Capital	1,747,795,803	1,803,388,949	2,066,701,625	2,017,815,752	2,574,211,539	2,423,128,927	2,763,485,742	3,305,510,269	4,000,848,155	4,218,871,114
Debt (Loan)	905,828,592	758,707,495	1,026,652,897	882,543,444	1,358,657,741	1,121,280,676	1,355,460,077	1,804,734,123	2,384,829,881	2,523,041,083
Liquidity	-12.44%	11.81%	4.00%	2.83%	5.87%	8.46%	13.65%	18.62%	27.72%	29.64%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	4.44%	6.96%	3.19%	5.77%	4.66%	3.02%	2.53%	2.82%	2.23%	1.40%
ROE	12.45%	16.32%	8.62%	13.51%	13.72%	7.72%	7.54%	8.41%	7.70%	4.83%
Ln (Natural Log)										
Assets	21.58	21.62	21.76	21.70	22.00	21.93	22.16	22.22	22.44	22.49
Capital	21.28	21.31	21.45	21.43	21.67	21.61	21.74	21.92	22.11	22.16
Debt (Loan)	20.62	20.45	20.75	20.60	21.03	20.84	21.03	21.31	21.59	21.65

TEAM PRECISION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	525,772,199	611,662,746	920,694,099	1,173,717,866	1,374,000,842	1,192,669,619	1,082,499,560	1,507,245,838	1,261,264,638	1,176,783,862
Capital	430,207,913	517,871,236	620,189,425	843,615,970	1,095,853,696	959,286,632	810,177,421	1,142,167,462	926,863,445	817,905,148
Debt (Loan)	130,718,740	175,953,683	146,796,609	108,799,600	140,394,254	88,606,036	22,892,617	251,316,404	94,121,088	2,027,140
Liquidity	61.22%	86.29%	101.96%	143.85%	187.63%	111.88%	138.12%	96.33%	175.34%	209.53%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	5.18%	10.21%	18.62%	26.90%	24.64%	6.15%	-2.44%	7.05%	3.61%	2.37%
ROE	9.10%	18.26%	36.22%	42.97%	35.44%	8.42%	-3.36%	11.93%	5.47%	3.41%
Ln (Natural Log)										
Assets	20.08	20.23	20.64	20.88	21.04	20.90	20.80	21.13	20.96	20.89
Capital	19.88	20.07	20.25	20.55	20.81	20.68	20.51	20.86	20.65	20.52
Debt (Loan)	18.69	18.99	18.80	18.51	18.76	18.30	16.95	19.34	18.36	14.52

THAICOM PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	25,115,986,488	27,586,692,125	33,982,608,940	32,833,812,316	30,101,478,071	28,421,259,562	27,403,280,612	25,848,198,195	27,215,562,461	25,810,707,916
Capital	23,470,366,167	25,488,142,448	31,197,434,512	29,895,773,852	26,836,039,345	26,235,952,250	25,183,294,472	23,080,639,274	24,535,369,744	21,535,526,415
Debt (Loan)	15,027,136,035	16,324,024,679	17,392,145,853	16,318,104,592	10,151,866,539	10,132,707,934	9,557,484,367	8,401,987,083	10,358,922,616	7,297,011,574
Liquidity	-981.08%	907.39%	986.50%	699.19%	30.79%	313.12%	66.61%	52.25%	720.72%	-861.51%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	4.30%	3.10%	3.93%	-0.14%	10.11%	-2.50%	-1.72%	-3.03%	-1.85%	0.67%
ROE	12.79%	9.34%	9.68%	-0.34%	18.24%	-4.42%	-3.01%	-5.33%	-3.54%	1.22%
Ln (Natural Log)										
Assets	23.95	24.04	24.25	24.21	24.13	24.07	24.03	23.98	24.03	23.97
Capital	23.88	23.96	24.16	24.12	24.01	23.99	23.95	23.86	23.92	23.79
Debt (Loan)	23.43	23.52	23.58	23.52	23.04	23.04	22.98	22.85	23.06	22.71

TRUE CORPORATION PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	86,760,060,529	102,625,180,229	117,383,726,580	122,956,291,309	125,259,405,965	116,950,885,720	116,420,989,551	115,022,005,911	151,518,169,178	180,363,369,730
Capital	70,824,320,568	89,375,655,196	103,169,533,147	97,122,171,130	93,287,663,432	89,266,678,463	86,071,219,320	84,941,842,690	106,707,714,424	115,426,990,223
Debt (Loan)	69,329,257,456	84,638,102,885	95,257,674,534	89,722,013,935	83,236,912,521	82,646,616,735	75,428,783,820	72,472,049,208	85,238,371,191	101,422,612,525
Liquidity	-298.86%	172.46%	1709.22%	151.79%	123.48%	199.55%	178.38%	152.22%	45.00%	151.47%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	-6.54%	0.59%	-2.78%	-3.40%	1.24%	-2.89%	1.04%	1.61%	-1.81%	-4.13%
ROE	-379.52%	12.77%	-41.24%	-56.49%	15.50%	-51.14%	11.38%	14.89%	-12.74%	-53.18%
Ln (Natural Log)										
Assets	25.19	25.35	25.49	25.54	25.55	25.49	25.48	25.47	25.74	25.92
Capital	24.98	25.22	25.36	25.30	25.26	25.21	25.18	25.17	25.39	25.47
Debt (Loan)	24.96	25.16	25.28	25.22	25.14	25.14	25.05	25.01	25.17	25.34

TT&T PUBLIC COMPANY LIMITED										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	42,812,823,522	41,215,692,628	38,195,095,204	35,026,671,685	32,924,652,499	32,727,525,038	31,268,272,258	19,721,534,861	13,445,711,317	4,995,740,148
Capital	41,256,308,420	39,436,085,556	37,204,522,359	33,575,119,962	30,751,649,161	29,122,688,772	27,568,284,282	17,091,373,834	10,656,531,026	2,059,041,884
Debt (Loan)	28,543,544,330	24,207,072,939	22,473,336,608	19,754,718,955	18,959,471,887	20,258,164,505	21,192,530,416	22,940,442,363	18,726,460,972	17,781,920,254
Liquidity	303.19%	300.82%	51.13%	-159.27%	-1475.26%	3170.15%	-11270.33%	581.19%	-43.07%	140.48%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	2.30%	-0.56%	-4.59%	-3.08%	-6.16%	-8.95%	-7.96%	-61.99%	-19.93%	-153.23%
ROE	7.74%	-1.53%	-11.90%	-7.81%	-17.20%	-33.03%	-39.03%	209.00%	33.20%	48.69%
Ln (Natural Log)										
Assets	24.48	24.44	24.37	24.28	24.22	24.21	24.17	23.70	23.32	22.33
Capital	24.44	24.40	24.34	24.24	24.15	24.09	24.04	23.56	23.09	21.45
Debt (Loan)	24.07	23.91	23.84	23.71	23.67	23.73	23.78	23.86	23.65	23.60



APPENDIX H

Average values of variables in years

Average value of variables in years										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Assets	16,075,824,125	16,636,037,461	17,477,879,872	18,374,143,010	18,445,952,294	18,374,354,573	18,141,941,473	17,055,867,285	18,411,970,726	19,816,848,958
Capital	13,420,711,096	14,264,200,681	15,200,555,864	15,518,523,933	15,381,261,862	15,760,402,628	15,287,328,124	13,888,723,875	14,189,744,904	14,238,534,208
Debt (Loan)	7,897,591,920	7,750,326,355	7,962,331,064	7,785,824,272	7,047,230,728	7,532,421,945	6,877,037,958	6,448,433,282	7,820,244,297	7,786,427,952
Liquidity	-50.57%	99.47%	183.50%	100.78%	97.67%	190.52%	-264.16%	-302.12%	7.09%	34.65%
GDP	7.10%	6.30%	4.60%	5.10%	5.00%	2.50%	-2.30%	7.80%	0.10%	6.50%
Inflation	1.80%	2.70%	4.50%	4.70%	2.30%	5.48%	-0.80%	3.30%	3.80%	3.00%
ROA	7.37%	7.31%	7.06%	3.58%	7.58%	-3.62%	2.25%	3.20%	-4.13%	1.34%
ROE	10.49%	1.27%	14.03%	4.70%	13.95%	-106.43%	-19.74%	12.77%	0.09%	19.14%
Ln (Natural Log)										
Assets	23.50	23.53	23.58	23.63	23.64	23.63	23.62	23.56	23.64	23.71
Capital	23.32	23.38	23.44	23.47	23.46	23.48	23.45	23.35	23.38	23.38
Debt	22.79	22.77	22.80	22.78	22.68	22.74	22.65	22.59	22.78	22.78



