

**DETERMINANTS OF COST OF CAPITAL FOR THAILAND
COMMUNICATION CORPORATIONS**

by

SOMPOAT CHANSOMBOON

**A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of**

Master of Business Administration

**Graduate School of Business
Assumption University
Bangkok Thailand**

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ABSTRACT

Companies thrive when they create real economic value for their shareholders. Companies create value by investing capital at rates of return that exceed their cost of capital. Managers need to understand how cost of capital affects the valuation of the enterprise. The consequences of misunderstanding can be devastating. Correctly evaluating the cost of capital and thereby determining the value creation potential of investments in a business is imperative. Therefore, the purpose of this research study is to study the determinants of WACC for Thailand Communication Corporations listed on The Stock Exchange of Thailand (SET).

This research study identifies and analyses the factors affecting WACC of Thailand Communication Corporations listed on SET, by using multiple regression technique on the basis of the accounting data in financial statements for the years 1994 to 2001. The independent variables of this research are External factors (Inflation, GDP) and Company-Specific factors (Systematic risk or beta, Current ratio, Coverage ratio and Capital size). The dependent variable of this research is Weighted Average Cost of Capital or (WACC).

The results from the regression analysis show that, only four of seven variables are statistically significant at 5 % level. They are Inflation Rate, GDP Growth, Systematic Risk (Beta), and Capital Size. The first three variables are found to be positively related with WACC while the Capital Size is negatively related with WACC. The rest are Current Ratio, Debt to Equity Ratio, and Coverage Ratio. Even though these three variables failed to reject the null hypothesis at statistically significant 5 % level, based on the previous study these three variables still have impact on the WACC and in this study, the researcher found that the coefficient sign

for Current Ratio is positively related with WACC while Debt to Equity Ratio, and Coverage Ratio are negatively related with WACC.



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TABLE OF CONTENTS

	Page No.
Abstract	i
Acknowledgements	iii
Table of Contents	iv
List of Tables	vii
List of Figures	viii
Chapter 1: Generalities of the Study	1
1.1 Introduction of the Study	1
1.2 Research Objectives	4
1.3 Statements of Problem	5
1.4 Scope of the Research	5
1.5 Limitations of Study	5
1.6 Significance of the Study	6
1.7 Definition of terms	7
Chapter 2: Literature Review	13
2.1 Relevant Theories	13
2.2 Previous Empirical Studies	35
Chapter 3: Research Framework	60
3.1 Theoretical Framework	60
3.2 Conceptual Framework	61
3.3 Research Hypotheses	62
3.4 Operationalization of the Independent and Dependent Variables	63

Chapter 4: Research Methodology	68
4.1 Research Methods Used	68
4.2 Respondents and Sampling Procedures	78
4.3 Research Instruments	80
4.4 Collection of Data	80
4.5 Statistical Treatment of Data	81
Chapter 5: Presentation of Data and Critical Discussion of Results	82
5.1 Multiple Regression Model	82
5.2 Testing Hypothesis	90
Chapter 6: Summary of Findings, Conclusion, and Recommendation	93
6.1 Summary of Findings	93
6.2 Conclusion	96
6.3 Recommendations	98
Bibliography	100
Appendices	
Appendix A.1: Advanced Info Service Public Company Limited	
Appendix A.2: The International Engineering Public Company Limited	
Appendix A.3: Jasmine International Public Company Limited	
Appendix A.4: Samart Corporation Public Company Limited	
Appendix A.5: Samart Telecoms Public Company Limited	
Appendix A.6: Shinawatra Satellite Company Limited	
Appendix A.7: Shin Corporation Public Company Limited	
Appendix A.8: Telecomasia Corporation Public Company Limited	
Appendix A.9: Thai Telephone & Telecommunication Public Company Limited	
Appendix A.10: United Communication Industry Public Company Limited	

Appendix B: The dependent and independent variables.

Appendix C: The statistical results from SPSS program.



LIST OF TABLES

	Page No.
Table 2.1: Summary of previous studies	54
Table 3.1: Operational Definitions of Influencing Variables	64
Table 3.2: Measurement of the Dependent Variable	67
Table 5.1: Dependent and Independent Variables	82
Table 5.2: Model Summary	84
Table 5.3: ANOVA	85
Table 5.4: Coefficients	86
Table 5.5: Excluded Variables	86
Table 5.6: Descriptive Statistics	88
Table 5.7: Residuals Statistics	88
Table 6.1: Standardized Coefficient Beta	94
Table 6.2: Testing Hypothesis Results	95

LIST OF FIGURES

	Page No.
Figure 2.1: The Security Market Line (SML) with Debt and Stock Illustrated.	29
Figure 2.2: Creating Value by Accepting Projects Expected to Provide Returns greater than their Respective Required Returns.	35
Figure 3.1: Conceptual Framework.	61
Figure 4.1: Selecting from the Most Common Multivariate Techniques.	70
Figure 5.1: Histogram for WACC	89
Figure 5.2: Normal P-P plot for WACC.	89



CHAPTER 1

GENERALITIES TO THE STUDY

1.1 Introduction of the Study

Companies thrive when they create real economic value for their shareholders. Companies create value by investing capital at rates of return that exceed their cost of capital. This applies equally to U.S., European, and Asian companies. When companies forget these simple truths, consequences are evident: hostile takeovers in the United States in the 1980s, the collapse of the bubble economy in Japan in the 1990s, the broad Southeast Asian crisis in 1998, and the persistently slow growth and high unemployment in Europe. While the underlying drivers of these events can be traced to a number of factors – most often in appropriate government policies or structural deficiencies – the lack of focus on value creation by managers – is a key link in the chain leading to economic malaise or crisis (Tom Copeland, Koller, Murrin, 2000).

In today's competitive business environment, managers need to understand how cost of capital affects the valuation of the enterprise. The consequences of misunderstanding can be devastating. Correctly evaluating the cost of capital and thereby determining the value creation potential of investments in a business is imperative. Therefore, with the current economic situation, companies have to make a good decision in order to maximize shareholders' value. A clear understanding of the cost of capital is one important factor that can help the enterprise to maximize shareholders value, because the most important use of the cost of capital is in the capital budgeting process of the company.

Many stakeholders are affected by a company's decisions. There are providers of capital, including equity shareholders, bondholders, and lenders. There are suppliers of raw materials and component parts to the company. There are creators of the product, including employee independent contractors, and managers. There are customers of the company, including purchasers and users of the product. How would they define the value of the project? Legal concepts of private property provide a clear answer to the question concerning the definition of value. Managers must define value as the value to the owners, who are the shareholders. If managers undertake projects that don't maximize shareholder value, shareholders will rationally exercise their rights to remove the managers and replace them with the managers who will undertake value-maximizing projects. Of course, the real competitive world is not simple. The widely dispersed ownership of most major corporations creates enormous monitoring problems on the part of shareholders. In fact, it's not clear whether atomistic shareholders are effective in either monitoring management or applying in remedies. There is, however, an increasingly active market for corporate control where external raiders apply considerable pressure on managers who don't maximize shareholders' value.

A company can be viewed as a collection of projects. As a result, the use of an overall cost of capital as the acceptance criterion for investment decisions is appropriate only under certain circumstances. These circumstances are that the current projects of the enterprise are of similar risk. When investment proposals vary with respect to risk, the required rate of return for the company as a whole is not appropriate as the sole acceptance criterion. The advantage of using the enterprise's overall required rate of return is, of course, its simplicity. Its computed projects can be evaluated using a single rate that does not change unless underlying business and

financial market conditions change. Using a single hurdle rate avoids the problem of computing individual required rate of return for each investment proposal. It is important to note, however, that if the enterprise's overall required rate of return is used as an acceptance criterion, projects should generally correspond to the foregoing conditions. Otherwise, one should determine an individual acceptance criterion for each project.

Given the valuation importance of Weighted Average Cost of Capital (WACC), it is a widely used concept in the theoretical literature of finance as well as in the analysis of capital expenditure of business enterprises. The importance of the concept derives from its use as the cutoff point for investment in capital projects is as an indicator of optimal capital structure. Difference between the true overall average cost of capital and the true overall cost are typically attributed to deviations of market values from book values, changes in the proportional use of specific capital source, or alterations in the risk characteristics of the stream of payments to owners and creditors. The overall cost of capital of the enterprise is a proportionate average of the costs of the various components of the enterprise's financing. The cost of equity capital is the most difficult to measure. The researcher has also considered the component cost of debt and preferred stock. In this study, concerning the computed the cost of the individual components of the enterprise's financing, the researcher would assign weights to each financing source then calculate a WACC. In this study, the concern is on that factors that affects WACC. These factors are as follows: the external or general factors (Inflation rate, GDP) and The Company – Specific factors (Current ratio, Debt to Equity ratio, Coverage ratio, Systematic risk or Beta measuring the risk, Size of Capital).

The study focuses on Communication Corporations listed on The Stock Exchange of Thailand (SET). In the year 2006, Thailand will liberalize the communication business. As a result, the communication business in Thailand will have the intensive competition because international companies could enter into this business easier than before. With their high technology and also huge capital investment, the foreign companies can compete effectively with existing communication companies in Thailand. And in the researcher's opinion, the existing companies will suffer from this new entrant of the foreign companies.

Thus, the knowledge of understanding in cost of capital is very significant for the companies in order to compete with other companies and compete with themselves as well. In this research, the researcher has constructed a model for WACC to examine the relation of the independent variable, both external and in company – specific factors, to the dependent variable (WACC).

1.2 Research Objectives

The general purpose of this research is to study the determinants of WACC for Thai Communication Corporations listed on The Stock Exchange of Thailand (SET). Specifically, the objectives of this research are as follows:

- To study the factors that affect WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET). These factors are divided into the external factors and the company – specific factors.
- To develop WACC regression models on the basis of accounting data by considering financial statement for Thai Communication Corporations listed on The Stock Exchange of Thailand (SET).

1.3 Statements of Problem

A corporate manager requires an estimate of his or her companies' WACC to evaluate the cash flows associated with proposed capital investments. The manager should also understand how the WACC changes overtime. In connection with these issues, this study is designed to seek answers to the following questions:

- What are the factors that influence WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET)?
- How significant are the relationships between these factors and WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET)?

1.4 Scope of the Research

This research study identifies and analyses the factors affecting WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET), by using accounting information in financial statements for the years 1994 to 2001 from the ISIMS (Integrated – SET Information Management System) CD ROM from The Stock Exchange of Thailand (SET).

1.5 Limitations of the Study

The data complies from the financial statements are presumed to be true and to reflect the true condition of the company. In this research study, non – listed companies are not covered because of lack of adequate information. In Thailand, there is a regulation that requires all registered companies, public company limited, company limited, and limited partnership, to send their financial reports to the Department of Commercial Registration, Ministry of Commerce. In addition, all of

public companies limited have to send their financial reports to The Stock Exchange of Thailand for the use of investors and other users invested in the performance of these companies. Moreover, there is a clear difference in accounting procedures and doing business. Therefore, this research focuses on Thai Communication Corporations listed in Stock Exchange of Thailand. Moreover, according to some limitation of data gathered from SET, for the value of weight of debt (K_d) and weight of equity (K_e), the researcher has to use book value approach to calculate these two figures instead of using market value approach.

In this research, the researcher studies only one sector that is listed in SET and that is Communication sector, and for only one period of time from years 1994 to 2001.

According to the Fund Matching Principle, the stock value is not just a function of short – term earnings but is determined largely by future cash flows. Shareholders recognize and value future cash flows, and not just short – term earning. Therefore, in this study, WACC calculation will not include short – term funding.

1.6 Significance of the Study

This research study will contribute to theoretical and empirical approaches for the determination of WACC and provide the following benefits:

- To provide an alternative for empirical evidences on the characteristic of WACC and the relevance of accounting information in evaluation.
- To examine the relationship between the independent variables and the dependent variable (WACC).
- To develop regression model of WACC to help managers, owners, business analysts, creditors, government, investors and other users in

estimating WACC for careful decision making. Clearly understanding the cost of capital is one important factor that can help the enterprise to maximize shareholders value, because the most important use of the cost of capital is in capital budgeting process of the company.

1.7 Definition of Terms

- Capital Budgeting:** Investment decisions involving fixed assets. The term *capital* refers to long term assets used in production, while a budget is a plan which details projected inflows and outflows during some future period. Thus capital budgeting is the whole process of analyzing projects and deciding which one to include in the capital budget.
- Capital Size:** The amount of capital employed in a company, including both debt and equity capital. For this study, the natural logarithm of the amount of the company's capital has been employed as an indicator of capital size.
- CAPM:** Capital Asset Pricing Model, specifies an explicit relationship between the expected return on an asset and the risk of that asset. The relevant riskiness of an individual stock is its contribution to the riskiness of a well diversified portfolio. The CAPM postulates

that the opportunity cost of equity is equal to the return on risk-free securities plus the company's systematic risk (beta) multiplied by the market price of risk (market risk premium).

Coefficient of determination (R^2): Measure of the proportion of the variance of the dependent variable explained by the independent, or predictor, variables. The coefficient can vary from 0 to 1. If the regression model is properly applied and estimated, the higher the value of R^2 , the greater the explanatory power of the regression equation, and therefore the better prediction of the criterion variable.

Collinearity: The association, measured as the correlation, between two independent variables.

Communication Corporation: In this study, Communication Corporation is defined as the ten communication companies in Thailand that are listed on The Stock Exchange Thailand (SET). These ten companies are as follows: 1. Advanced Info Service Public Company Limited (ADVANC), 2. The International Engineering Public Company Limited (IEC), 3. Jasmine International Public Company Limited

(JASMN), 4. Samart Corporation Public Company Limited (SAMART), 5. Samart Telecoms Public Company Limited (SAMTEL), 6. Shinawatra Satellite Company Limited (SATTEL), 7. Shin Corporation Public Company Limited (SHIN), 8. Telecomasia Corporation Public Company Limited (TA), 9. Thai Telephone & Telecommunication Public Company Limited (TT&T), 10. United Communication Industry Public Company Limited (UCOM).

Consolidation: The combination of financial statements for two or more separate legal entities when one company, (the parent), controls directly or indirectly, holding more than 50% of the voting stock of the other company.

Cost of Capital: The composite cost of financing, which comes from both debt and equity.

Cost of Debt (K_d): The required rate of return on investment of the lenders of a company. It is the cost to a company in borrowing money.

Cost of Preferred Stock (K_p): The required rate of return on investment of the preferred shareholders of the company. It is the cost to a company of issuing new preferred stock shares to raise funds now.

Cost of Equity (K_e):	The required rate of return on investment of the common shareholders of the company.
Coverage Ratio:	Is calculated by dividing earnings before interest and taxes (EBIT) by interest expenses, in order to measure the ability of companies to pay its interest expense. In this research, coverage ratio means Interest coverage ratio.
Current Ratio:	Is calculated by dividing current assets by current liabilities, in order to measure the liquidity of the enterprise.
Debt – Equity ratio:	Is calculated by dividing interest bearing debt by total equity, in order to measure the percentage of funds provided by creditors.
Dependent Variable:	Variable being predicted or explained by the set of independent variables.
Determinant:	An influencing or determining factor.
Financial Statements	the annual report presenting four basic financial statements – the balance sheet, the income statement, the statement of retained earning, and the statement of cash flows. These statements give an accounting picture of the enterprise's operations and financial position.
Gross Domestic Product (GDP):	Is the sum of all goods and services produced within a nation's boundaries, GDP

measure aggregate business activity as described by the value at final point of sale of all goods and services produced in domestic economy during a giving period by both domestic and foreign owned enterprises.

Independent Variable: Variable(s) selected as predictors and potential explanatory variable of the dependent variable.

Inflation: A sustained increase in the prices of all goods and services is inflation. Inflation can be caused by many factors; two of the most important are costs and demand.

Listed Company: Is a company whose shares are listed for trading on the stock exchange. A listed company must have qualifications required by the SET and abide by Listing Agreement.

Metric: Refers to ratio and interval measurements.

Multicollinearity: Refers to the correlation among three or more independent variables.

Multiple regression analysis: Is a statistical technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent (predictor) variables.

Multiple regression model: Regression model with two or more independent variables.

Multivariate analysis: Is statistic techniques which focus upon, and bring out in bold relief, the structure of simultaneous relationships among three or more phenomena.

Nonmetric: Refers to the data that are nominal or ordinal.

Systematic Risk or beta measure the risk (β): Beta is a measure of the responsiveness of the excess returns for a security to those of the market, using some broad-based index such as the SET index as a surrogate for the market portfolio.

The Risk – Free rate (r_f): The risk-free rate is the return on security or portfolio of securities that has no default risk and is completely uncorrelated with return on anything else in the economy.

The Market Risk Premium: The market risk premium is the difference between the expected rate of return on the market portfolio and the risk-free rate,

$$E(r_m) - r_f$$

Weighted Average Cost of Capital (WACC): The require rate of return on each component is called its component cost, and the cost of capital used to analyze capital budgeting decisions should be a weight average of the various components' cost. It is called this weighted average cost of capital.

CHAPTER 2

REVIEW OF LITERATURE AND RELATED STUDIES

In this chapter, the relevant literature is reviewed. Some general concepts are described in order to provide the readers with an idea of Weighted Average Cost of Capital (WACC) and review all literatures relevant to the topic of the study. Section 2.1 mentions about all relevant theories of WACC. Section 2.2 is the previous empirical studies. In this research, to construct the research framework, the researcher bases mainly on previous researches as source of variables regarding the studied variables with support from relevant theories.

2.1 Relevant Theories

This section included relevant theories, regarding the independent variables and dependent variables of this study.

Introduction

Having just considered risk in the capital budgeting process, Managers need to understand how risk affects the valuation of the enterprise. Its effect on value is shown through the returns that financial markets expect the corporation to provide on debt, equity, and other financial instruments. In general, the greater the risk, the higher the returns the financial markets expect from a capital investment. Thus, the link from a capital investment to valuation is the required return used to determine whether or not a capital budgeting project will be accepted.

The acceptance criterion for capital investments is perhaps the most difficult and controversial topic in finance. We know that in theory the minimum acceptable rate of return on a project should be the rate that will leave the market price of the company's common stock unchanged. The difficulty lies in determining this rate in practice, because predicting the effect of capital investment decisions on stock prices is an inexact science (some would call it an art form). Estimating the appropriate required rate of return is inexact as well. Rather than skirting the issue, we address it head on and propose a general framework for measuring the required rate of return. The idea is a simple one. We try to determine the opportunity cost of a capital investment project by relating it to a financial market investment with the same risk.

Creation of Value

If the return on a project exceeds what the financial markets require, (Ehrhardt, Michael C., 1995) it is said to earn an excess return. This excess return, as we define it, represents the creation of value. Simply put, the project earns more than its economic keep.

Industry Attractiveness

Value creation has several sources, but perhaps the most important ones are industry attractiveness and competitive advantage. These are the things that give rise to projects with positive net present value—ones that provide expected returns in excess of what the financial markets require. Favorable industry characteristics include positioning in the growth phase of a product cycle, barriers to competitive entry, and other protective devices such as patents, temporary monopoly power, and/or oligopoly pricing where nearly all competitors are profitable. In short, industry

attractiveness has to do with the relative position of an industry in the spectrum of value-creating investment opportunities. (Tom Copeland, Koller, Murrin, 2000).

Competitive Advantage

Competitive advantage involves a company's relative position within an industry. The company could be multidivisional, in which case competitive advantage needs to be judged industry by industry. The avenues to competitive advantage are several: cost advantage, marketing and price advantage, perceived quality advantage, and superior organizational capability (corporate culture). Competitive advantage is eroded with competition. Relative cost, quality, or marketing superiority, for example, is conspicuous and will be attacked. A successful company is one that continually identifies and exploits opportunities for excess returns. Only with a sequence of short-run advantages can any overall competitive advantages be sustained.

Thus, industry attractiveness and competitive advantage are principal sources of value creation. The more favorable these are, the more likely the company is to have expected returns in excess of what the financial markets require for the risk involved. (Tom Copeland, Koller, Murrin, 2000).

Overall Cost of Capital of the Enterprise

A company can be viewed as a collection of projects. As a result, the use of an overall cost of capital as the acceptance criterion (hurdle rate) for investment decisions is appropriate only under certain circumstances. These circumstances are that the current projects of the enterprise are of similar risk and that investment proposals under consideration are of the same character. If investment proposals vary widely with respect to risk, the required rate of return for the company as a whole is

not appropriate as the sole acceptance criterion. The advantage of using the enterprise's overall required rate of return is, of course, its simplicity. Once it is computed, projects can be evaluated using a single rate that does not change unless underlying business and financial market conditions change. Using a single hurdle rate avoids the problem of computing individual required rates of return for each investment proposal. It is important to note, however, that if the enterprise's overall required rate of return is used as an acceptance criterion, projects should generally correspond to the foregoing conditions. Otherwise, one should determine an individual acceptance criterion for each project, a topic that we take up in the latter part.

The overall cost of capital of an enterprise is a proportionate average of the costs of the various components of the enterprise's financing. The *cost of equity capital* is the most difficult to measure, and it will occupy most of our attention. We also consider the component *costs of debt and preferred stock*. Our concern throughout will be with the marginal cost of a specific source of financing. The use of marginal costs follows from the fact that we use the cost of capital to decide whether to invest in new projects. Past costs of financing have no bearing on this decision. All costs will be expressed on an after-tax basis, to conform to the expression of investment project cash flows on an after-tax basis. Once we have examined the explicit costs of the various sources of financing, we will assign weights to each source. Finally, we will compute a weighted average of the component costs of financing to obtain an overall cost of capital to the enterprise. (Eugene F. Brigham, 1999)

Cost of Debt

Although the liabilities of a company are varied, our focus is only on nonseasonal debt that bears an explicit interest cost. We ignore accounts payable, accrued expenses, and other obligations not having an explicit interest cost. For the most part, our concern is with long-term debt. However, continuous short-term debt, such as an accounts-receivable-backed loan, also qualifies. (A bank loan to finance seasonal inventory requirements would not qualify.) The assumption is that the enterprise is following a *hedging approach* to project financing. That is, the enterprise will finance a capital project, whose benefits extend over a number of years, with financing that is generally long term in nature.

The explicit cost of debt can be derived by solving for the discount rate, k_d , that equates the market price of the debt issue with the present value of interest plus principal payments and by then adjusting the explicit cost obtained for the tax deductibility of interest payments. The discount rate, k_d , known as the *yield to maturity*, is solved by making use of the formula

$$P_o = \sum_{t=1}^n \frac{I_t + P_t}{(1 + k_d)^t} \quad (2-1)$$

where P_o is the current market price of the debt issue; Σ denotes the summation for periods 1 through n , the final maturity; I_t is the interest payment in period t ; and P_t is the payment of principal in period t . If principal payments occur only at final maturity, only P_n will occur. By solving for k_d , the discount rate that equates the present value of cash flows to the suppliers of debt capital with the current market price of the new debt issue, we obtain the required rate of return of the lenders to the company. This required return to lenders can be viewed as the issuing company's

before tax cost of debt. (Most of this should already be familiar to you from our discussion of yield to maturity (YTM) on bonds.)

The after-tax cost of debt, which we denote by k_i , can be approximated by

$$k_i = k_d(1 - t) \quad (2-2)$$

where k_d remains as previously stated and t is now defined as the company's marginal tax rate. Since interest charges are tax deductible to the issuer, the after-tax cost of debt is substantially less than the before-tax cost.

The explicit cost of debt is considerably cheaper than the cost of another alternative source of financing having the same yield to suppliers of capital but the financial charges are not deductible for tax purposes. Implied in the calculation of an after-tax cost of debt is the fact that the enterprise has taxable income. Otherwise, it does not gain the tax benefit associated with interest payments. The explicit cost of debt for enterprise without taxable income is the before-tax cost.

Cost of Preferred Stock

The cost of preferred stock is the function of its stated dividend. This dividend is not a contractual obligation of the enterprise but rather is payable at the discretion of the enterprise's board of directors. Consequently, unlike debt, it does not create a risk of legal bankruptcy. To the holders of common stock, however, preferred stock is a security that takes priority over their securities when it comes to the payment of dividends and to the distribution of assets if the company is dissolved. Most corporations that issue preferred stock fully intend to pay the stated dividend. The market-required return for this stock, or simply the yield on preferred stock, serves as our estimate of the cost of preferred stock. As preferred stock has no maturity date, its cost, k_p , may be represented as

$$k_p = D_p / P_o \quad (2-3)$$

where D_p is the stated annual dividend and P_o is the current market price of the preferred stock. Note that this cost is not adjusted for taxes because the preferred stock dividend used in the formula is already an after-tax figure—preferred stock dividends being paid after taxes. Thus, the explicit cost of preferred stock is greater than that for debt.

Cost of Equity: Dividend Discount Model Approach

The cost of equity capital is by far the most difficult cost to measure. Equity capital can be raised either internally by retaining earnings or externally by selling common stocks. In theory, the cost of both may be thought of as the minimum rate of return that the company must earn on the equity-financed portion of an investment project in order to leave the market price of the enterprise's common stock unchanged. If the enterprise invests in projects having an expected return less than this required return, the market price of the stock will suffer over the long run.

In the context of the dividend discount valuation models, the cost of equity capital, k_e , can be thought of as the discount rate that equates the present value of all expected future dividends per share, as perceived by investors at the margin, with the current market price per share.

$$P_o = \frac{D_1}{(1 + k_e)} + \frac{D_2}{(1 + k_e)^2} + \dots + \frac{D_\infty}{(1 + k_e)^\infty}$$

$$= \sum_{t=1}^{\infty} \frac{D_t}{(1 + k_e)^t} \quad (2-4)$$

Where P_o is the market price of a share of stock at time 0, D_t is the dividend per share expected to be paid at the end of time period t , k_e , is the appropriate discount rate, and

Σ represents the sum of the discounted future dividends from period 1 through infinity, depicted by the symbol ∞ .

Cost of Equity: Capital-Asset Pricing Model Approach

Rather than estimation the future dividend stream of the enterprises and then solving for the cost of equity capital, we may approach the problem directly by estimating the required rate of return on the company's common stock. From our discussion of the capital-asset pricing model (CAPM), we know that the CAPM implies the following required rate of return, K_c , for a share of common stock:

$$K_c = R_f + (\bar{R}_m - R_f)\beta_j \quad (2-5)$$

where R_f is the risk-free rate, \bar{R}_m is the expected return for the market portfolio, and β is the beta coefficient for stock j . because of the market's aversion to systematic risk, the greater the beta of a stock, the greater its required return. The risk-return relationship is known as the security market line. It implies that in market equilibrium, security prices will be such that there is a linear trade-off between the required rate of return and systematic risk, as measured by beta.

Beta is a measure of the responsiveness of the excess returns for a security (in excess of the risk-free rate) to those of the market, using some broad-based index such as the S&P 500 Index as a surrogate for the market portfolio. If the historical relationship between security returns and those for the market portfolio is believed to be a reasonable proxy for the future, one can use past returns to compute beta for a stock. A characteristic line was fitted to the relationship between returns in excess of the risk-free rate for a stock and those for the market index. *Beta* is defined as the slope of this line. To free us of the need to calculate beta information directly, several services (for example, Value Line Investment Survey and Standard & Poor's Stock

Reports) provide historical beta information on a large number of publicly traded stocks. These services allow us to obtain the beta for a stock with ease, thereby greatly facilitating the calculation of the cost of equity capital. If the past is thought to be a good proxy for the future, the researcher can use Equation (2-5) to compute the cost of equity capital for a company.

Beta calculation

In order to find the value of Systematic risk or beta. There are two methods. First is using Covariance divided by square of standard deviation. And second is using regression model method by finding the slope between the closing price from SET and the closing price from company, $Y = mX + C$. While Y is SET index, X is Company index and m is the slope or in this study m is the Systematic risk or Beta. The researcher examined portfolio risk at an intuitive level. The researcher now describes how portfolio risk is actually measured and dealt with in practice. First, the riskiness of a portfolio, which may itself be continued as a single asset held in isolation, is measured by the standard deviation of its return distribution. Equation 2-6 is used to calculate this standard deviation:

$$\text{Portfolio standard deviation} = \sigma = \sqrt{\sum_{i=1}^n (k_{pi} - \hat{k}_p)^2 P_i}$$

$$\sigma = \sum_{i=1}^n \sqrt{\frac{(x_i - \bar{x})^2}{n - 1}} \quad (2-6)$$

Here σ_p is the portfolio's standard deviation; k_{pi} is the return on the portfolio under the i_{th} state of the economy; \hat{k}_p is the expected rate of return on the portfolio; P_i is the probability of occurrence of the i_{th} state of the economy; and there is n

economic states. This equation is exactly the same as the one for the standard deviation of a single asset, except that here the asset is a portfolio of assets (for example, a mutual fund).

Covariance and the Correlation Coefficient

Two key concepts in portfolio analysis are (1) covariance and (2) the correlation coefficient. **Covariance** is a measure which combines the variance (or volatility) of a stock's returns with the tendency of those returns to move up or down at the same time other stocks move up or down. For example, the covariance between Stocks A and B tells us whether the returns of the two stocks tend to rise and fall together, and how large those movements tend to be. Equation 2-7 defines the covariance (Cov) between Stocks A and B:

$$\begin{aligned} \text{Covariance} = \text{Cov}(AB) &= \sum_{i=1}^n (k_{Ai} - \hat{k}_A)(k_{Bi} - \hat{k}_B)P_i \\ \text{Cov} &= \sum_{i=1}^n \frac{(x_i - \bar{x})(y_i - \bar{y})}{n - 1} \end{aligned} \quad (2-7)$$

The first term in parentheses after the Σ is the deviation of Stock A's return from its expected value under the i_{th} state of the economy; the second term is Stock B's deviation under the same state; and P_i is the probability of the i_{th} state occurring.

In addition to beta, it is important that the numbers used for the risk-free rate and the expected market return in Equation (2-5) be the best possible estimates of the future. The risk-free return estimate is controversial—not as to the type of security return that should be used but as to the security's relevant maturity. Most agree that a Treasury security, which is backed by the full faith and credit of the U.S. government, is the proper instrument to use in making a “risk-free” return estimate. But the choice

of a proper maturity is another matter. As the CAPM is a one-period model, some contend that a short-term rate, such as that for three-month Treasury bills, is in order. Others argue that because capital investment projects are long-lived, a long-term Treasury bond rate should be used. Still others, the authors included, feel more comfortable with an intermediate-term rate, such as that on one- or two-year Treasury securities. This is a middle position in a rather murky area. With an upward sloping yield curve (graph of the relationship between yields and maturity), the longer the maturity, the higher the risk-free rate.

For the expected return on the market portfolio of stock, as usually depicted by the S&P 500 Index, one can use consensus estimates of security analysts, economists, and others who regularly predict such returns. Goldman Sachs, Merrill Lynch, and other investment banks make these predictions, often on a monthly basis. These estimated annual returns are for the immediate future. The expected return on the market portfolio has exceeded the risk-free rate by anywhere from 3 to 7 percent in recent years. Expressed differently, the “before-hand” or *ex ante* market risk premium has ranged from 3 to 7 percent. This is not the range of risk premiums actually realized over some holding period but rather the expected risk premium for investing in the market portfolio as opposed to the risk-free security. Due to changes in expected inflation, interest rates, and the degree of investor risk aversion in society, both the risk-free rate and the expected market return change over time. Therefore, the 14 percent figure that we computed earlier would be an estimate of the required return on equity at only a particular moment in time.

If measurements were exact and the assumption of a perfect capital market held, the cost of equity determined by this method would be the same as that provided by a dividend discount model. One has to recall that the latter estimate is the discount

rate that equates the present value of the stream of expected future dividends with the current market price of the stock. By now it should be apparent that we can only hope to approximate the cost of equity capital. The researcher believes that the methods suggested enable such an approximation more or less accurately, depending on the situation. For a large company whose stock is actively traded on the New York Stock Exchange and whose systematic risk is close to that of the market as a whole, managers can usually estimate more confidently than we can for a moderate-sized company whose stock is inactively traded in the over-the-counter market and whose systematic risk is very large. Managers must live with the inexactness involved in the measurement process and try to do as good a job as possible. In this study, the researcher find the Beta by running regression model to find the slope of SET closing price index and Company closing price index year by year.

The Arbitrage Pricing Theory

The restrictive assumptions on transactions costs and private information in the capital asset pricing model, and the model's dependence on the market portfolio, have long been viewed with skepticism by both academics and practitioners. Ross (1976) suggested an alternative model for measuring risk called the arbitrage pricing (APT).

If investors can invest risklessly and earn more than the riskless rate, they have found an arbitrage opportunity. The premise of the arbitrage pricing model is that investors take advantage of such arbitrage opportunities and, in the process, eliminate them. If two portfolios have the same exposure to risk but offer different expected returns, investors will buy the portfolio that has the higher expected returns, sell the portfolio with the lower expected returns, and earn the difference as a riskless profit.

To prevent this arbitrage form occurring, the two portfolios have to earn the same expected return.

Like the capital asset pricing model, the arbitrage pricing model begins by breaking risk down into firm-specific and market risk components. As in the CAPM, firm specific risk covers information that affects primarily the firm. Market risk affects many or all firms and would include unanticipated changes in a number of economic variables, including gross national product, inflation, and interest rates. Incorporating both types of risk into a return model, we get:

$$R = E(R) + m + \varepsilon$$

where R is the actual return, $E(R)$ is the expected return, m is the marketwide component of unanticipated risk, and ε is the firm-specific component. Thus, the actual return can be different from the expected return, either because of market risk or firm-specific actions.

Although both the CAPM and the APM make a distinction between firm-specific and marketwide risk, they measure market risk differently. The CAPM assumes that market risk is captured in the market portfolio, whereas the APM allows for multiple sources of marketwide risk and measures the sensitivity of investments to changes in each source. In general, the market component of unanticipated returns can be decomposed into economic factors:

$$\begin{aligned} R &= R + m + \varepsilon \\ &= R(\beta_1 F_1 + \beta_2 F_2 + \dots + \beta_n F_n) + \varepsilon \end{aligned}$$

where

β_j = Sensitivity of investment to unanticipated changes in factor j

F_j = Unanticipated changes in factor j

Note that the measure of an investment's sensitivity to any macroeconomic factor takes the form of a beta, called a factor beta. This beta has many of the same properties as the market beta in the CAPM.

The capital asset pricing model can be considered to be a special case of the arbitrage pricing model, where all of the economic factors collapsed into the market factor.

$$E(R) = R_f + \beta_m (E(R_m) - R_f)$$

The APM requires estimates of each of the factor betas and factor risk premiums in addition to the riskless rate. In practice, these are usually estimated using historical data on asset returns and a factor analysis. Intuitively, in a factor analysis, we examine the historical data looking for common patterns that affect broad groups of assets (rather than just one sector or a few assets). A factor analysis provides two output measures:

1. It specifies the number of common factors that affected the historical return data.
2. It measures the beta of each investment relative to each of the common factors and provides an estimate of the actual risk premium earned by each factor.

The factor analysis does not, however, identify the factors in economic terms. In summary, in the arbitrage pricing model, the market risk is measured relative to multiple unspecified macroeconomic variables, with the sensitivity of the investment relative to each factor being measured by a beta. The number of factors, the factor betas, and factor risk premiums can all be estimated using the factor analysis.

Multifactor Models for Risk and Return

The arbitrage pricing model's failure to identify the factors specifically in the model may be a statistical strength, but it is an intuitive weakness. The solution seems

simple. Replace the unidentified statistical factors with specific economic factors, and the resultant model should have an economic basis while still retaining much of the strength of the arbitrage pricing model. That is precisely what multifactor models try to do.

Multifactor models generally are determined by historical data rather than economic modeling. Once the number of factors has been identified in the arbitrage pricing model, their behavior over time can be extracted from the data. The behavior of the unnamed factors over time can then be compared to the behavior of macroeconomic variables over that same period to see whether any of the variables is correlated, over time, with the identified factors.

For instance, Chen, Roll, and Ross (1986) suggest that the following macroeconomic variables are highly correlated with the factors that come out of factor analysis: industrial production, changes in default premium on corporate bonds, shifts in the term structure, unanticipated inflation, and changes in the real interest rate. These variables can then be correlated with returns to come up with a model of expected returns, with firm-specific betas calculated relative to each variable.

$$E(R) = R_f + \beta_{GNP} (E(R_{GNP}) - R_f) + \beta_1 (E(R_1) - R_f) + \dots + \beta_a (E(R_a) - R_f)$$

where

β_{GNP} = Beta relative to changes in industrial production

$E(R_{GNP})$ = Expected return on a portfolio with a beta of 1 on the industrial production factor and 0 on all other factors

β_1 = Beta relative to changes in inflation

$E(R_1)$ = Expected return on a portfolio with a beta of 1 on the inflation factor and 0 on all other factors

The costs of going from the arbitrage pricing model to a macroeconomic multifactor model can be traced directly to the errors that can be made in identifying the factors. The economic factors in the model can change over time, as will the risk premiums associated with each one. For instance, oil price changes were a significant economic factor driving expected returns in the 1970s but are not as significant in other time periods. Using the wrong factor or missing a significant factor in a multifactor model can lead to inferior estimates of expected return.

In summary, multifactor models, like the arbitrage pricing model, assume that market risk can be captured best using multiple macroeconomic factors and betas relative to each. Unlike the arbitrage pricing model, multifactor models attempt to identify the macroeconomic factors that drive market risk.

Cost of Equity: Before-Tax Cost of Debt plus Risk Premium Approach

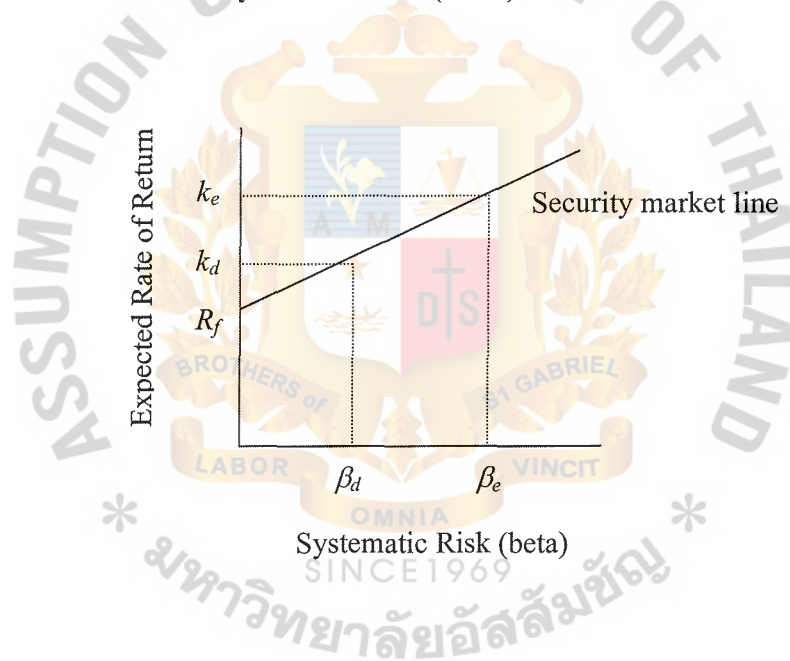
Rather than estimate the required return on equity capital using the sophisticated methods previously described, some people use a relatively simple, “fast and dirty,” approach. Here the company’s before-tax cost of debt forms the basis for estimating the enterprise’s cost of equity. The enterprise’s before-tax cost of debt will exceed the risk-free rate by a risk premium. The greater the risk of the enterprise, the greater this premium, and the more interest the enterprise must pay in order to borrow. The relationship is illustrated in Figure 2.1. On the horizontal axis, the enterprise’s debt is shown to have systematic risk equal to β_d . As a result, its required return is k_d , which exceeds the risk-free rate of R_f .

In addition to this risk premium, the common stock of a company must provide a higher expected return than the debt of the same company. The reason is that there is more systematic risk involved. This phenomenon is also illustrated in the

figure. We see that for an equity beta of β_e , and expected return of k_e is required and that this percentage exceeds the company's before-tax cost of debt, k_d . The historical risk premium in expected return for stocks over corporate bonds has been around 3 percent. If this seemed reasonable for a particular company, one could use the enterprise's before-tax cost of debt as a base and add to it a premium of around 3 percent in order to estimate its cost of equity capital.

$$k_e = \text{Before-tax cost of debt } (k_d) + \text{Risk premium in expected return for stock over debt} \quad (2-8)$$

Figure 2.1: The Security Market Line (SML) with Debt and Stock Illustrated



This percentage would then be used as an estimate of the cost of equity capital. The advantage of this approach is that one does not have to use beta information and make the calculation involved in Equation (2-5). One disadvantage is that it does not allow for changing risk premiums over time. Moreover, since the 3-4 percent risk premium is based on an average for companies overall, the approach is not as accurate as either of the other methods discussed for estimating the required

return on equity capital for a specific company. It does, however, offer an alternative method of estimating the cost of equity capital that falls within the overall framework of the capital-asset pricing model. It also provides a ready check on the reasonableness of the answers we get from applying the more complicated estimation techniques. In summary, in this study, the researcher has used CAPM model to find cost of equity (Equation 2-5).

Weighted Average Cost of Capital

Once the researcher has computed the costs of the individual components of the enterprise's financing, the researcher would assign weights to each financing source according to some standard and then calculate a weighted average cost of capital (WACC). Thus, the enterprise's overall cost of capital can be expressed as

$$\text{Cost of capital} = \sum_{x=1}^n k_x (w_x) \quad (2-9)$$

Or

$$\text{WACC} = W_d K_d (1-T) + W_p K_p + W_c K_c$$

where k_x is the after-tax cost of the x th method of financing, W_x is the weight given to that method of financing as a percentage of the enterprise's total financing, and Σ denotes the summation for financing methods 1 through n . To illustrate the calculations involved, it was supposed that the enterprise had a target capital structure calling for 30 % debt, 10 % preferred stock, and 60 % common equity. Its before-tax cost of debt, K_d , is 11 percent; its marginal tax rate is 40 percent; its cost of preferred stock, K_p , is 10.3 percent; its cost of common equity, K_c , is 14.7 percent. Hence this enterprise's Weighted Average Cost of Capital, WACC, can be calculated as follows:

$$\text{WACC} = W_d K_d (1-T) + W_p K_p + W_c K_c$$

Weighted	Cost	Results
$W_d = 0.3$	$K_d(1-T) = (11\%)(1-0.4)$	$W_d K_d(1-T) = 0.0198$
$W_p = 0.1$	$K_p = 10.3\%$	$W_p K_p = 0.0103$
$W_c = 0.6$	$K_c = 14.7\%$	$W_c K_c = 0.0882$
Therefore, WACC =		11.83%

Here W_d , W_p and W_c are the weighted averages used for debt, preferred, and common equity respectively. Common stock equity on this study is the sum total of common stock at par, additional paid-in capital, and retained earnings. For market value purpose, however, it is represented by the current market price per share of common stock times the number of shares outstanding. In calculating proportions, it is important that we use market value as opposed to book value weights. The reason for this is managers are trying to maximize the value of the enterprise for the benefit of its shareholder, only market value weights are consistent with our objective. Market values are used in the calculation of costs of the various components of financing, so market value weights should be used in determining the weighted average cost of capital. (Besides, the researcher is implicitly assuming that the current financing proportions will be maintained into the future.)

Rationale for a Weighted Average Cost

The rationale behind the use of a weighted average cost of capital is that by financing in the proportions specified and accepting projects yielding more than the weighted average required return, the enterprise is able to increase the market price of its stock. This increase occurs because investment projects are expected to return more on their equity-financed portions than the required return on equity capital, k_e .

Once these expectations are apparent to the marketplace, the market price of the enterprise's stock should rise because expected future earnings per share (and dividends per share) are higher than those expected before the projects that are expected to provide a turn greater than that required by investors at the margin, based on the risk involved.

Managers must return to the critical assumption that over time the enterprise finances projects in the proportions specified. If it does so, the financial risk of the company remains roughly unchanged. The implicit costs of financing are embodied in the weighted average cost of capital by virtue of the fact that an enterprise has to supplement non-equity financing with equity financing. It does not continually raise capital with supposedly cheaper debt funds without increasing its equity base. The enterprise's financing mix need not be optimal for the enterprise to employ the weighted average cost of capital for capital budgeting purposes. The important consideration is that the weights be based on the future financing plans of the company. If they are not, the weighted average cost of capital calculated does not correspond to the actual cost of funds obtained. As a result, capital budgeting decisions are likely to be suboptimal.

The use of a weighted average cost of capital figure must also be qualified for the points raised earlier. It assumes that the investment proposals being considered do not differ in systematic, or unavoidable, risk from that of the enterprise and that the unsystematic risk of the proposals does not provide any diversification benefits to the enterprise. Only under these circumstances is the cost of capital figure obtained appropriate as an acceptance criterion. These assumptions are extremely limiting. They imply that the projects of an enterprise are completely alike with respect to risk and that only projects of the same risk will be considered.

In actual practice, however, the issue is one of degree. If the conditions noted are approximately met, then the company's weighted average cost of capital may be used as the acceptance criterion. If an enterprise produced only one product and all proposals considered were in conjunction with the marketing and production of the product, the use of the enterprise's overall cost of capital as the acceptance criterion would probably be appropriate. (Even in this matter, however, there may be significant enough differences in risk among investment proposals to warrant separate consideration.) For a multiproduct enterprise with investment proposals of varying risk, the use of an overall required return is inappropriate. Here a required rate of return based on the risk characteristics of the specific proposal; should be used. We will determine these project-specific required rates of return with the methods proposed in the next section. The key, then, to using the overall cost of capital as a project's required rate of return is the similarity of the project with respect to the risk existing projects and investment proposals under consideration.

The CAPM: Project-Specific and Group-Specific Required Rates of Return

When the existing investment projects of the enterprise and investment proposals under consideration are not alike with respect to risk, the use of the enterprise's cost of capital as the sole acceptance criterion will not be possible. In such cases, we must formulate a specific acceptance criterion for the particular project involved. One mean for so doing relies on the capital-asset pricing model (CAPM).

Capital-Asset Pricing Model Approach to Project Selection

In this study, it is assumed initially that projects will be financed entirely by equity, that the enterprise considering projects is entirely equity financed, and that all

beta information pertains to all-equity situations. Later researcher modifies the approach for financial leverage, but in this study the understanding of the basic is made much easier if managers first ignore this consideration. This simplifying assumption results in the enterprise's overall cost of capital being simply its cost of equity. For such an enterprise, the CAPM approach to determining a required return is equivalent to determining the cost of equity capital of an enterprise. However, instead of the expected relationship between excess returns for common stock (returns in excess of the risk-free-rate) and those for the market portfolio, one is concerned with the expected relationship of excess returns for a project and those for the market portfolio. The required return for an equity-financed project, therefore, would be

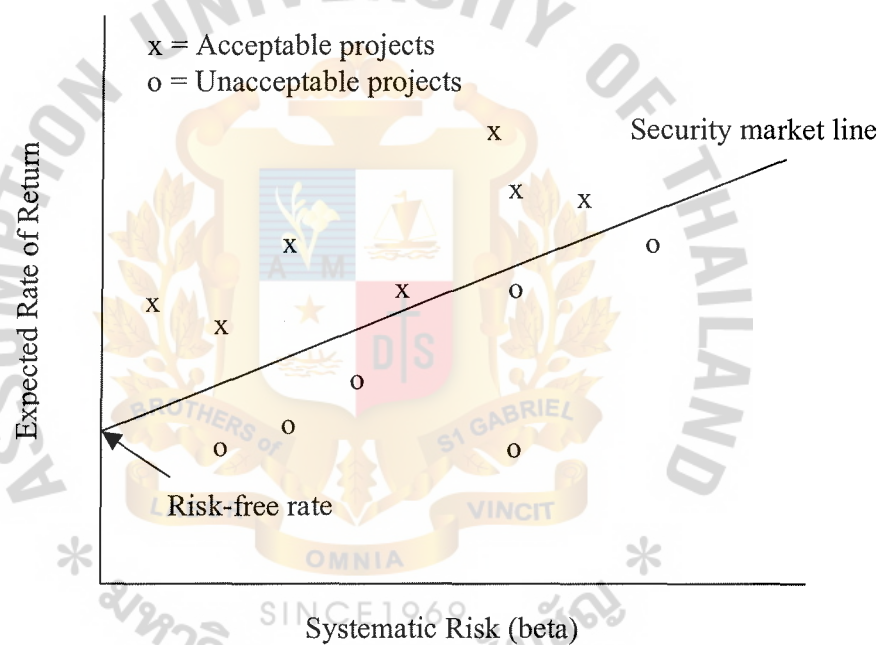
$$K_c = R_f + (\bar{R}_m - R_f)\beta_k \quad (2-10)$$

where β_k is the slope of the characteristic line that describes the relationship between excess returns for project k and those for the market portfolio. As can be seen, the right-hand side of this equation is identical to that of Equation (2-5) except for the substitution of the project's beta for that of the stock. R_k , then, becomes the required return for the project, which compensates for the project's systematic risk.

Assuming that the enterprise intends to finance a project entirely with equity, the acceptance criterion would then be to invest in the project if its expected return met or exceeded the required return, R_k , as determined by Equation (2-10). To illustrate the acceptance criterion for projects using this concept, we turn to Figure 2.2. The line in the figure represents the security market line – the market determined relationship between required rate of return and systematic risk. All projects with internal rates of return lying on or above the line should be accepted, because they are expected to provide returns greater than or equal to their respective required returns. Acceptable projects are depicted by x's. All projects lying below the line, shown by

the *o*'s, would be rejected. Note that the greater the systematic risk of a project, the greater the return that is required. If a project had no systematic risk, only the risk-free rate would be required. For projects with more risk, however, a risk premium is demanded, and it increases with the degree of systematic risk of the project. The goal of the enterprise, in this context, is to search for investment opportunities lying above the line.

Figure 2.2: Creating Value by Accepting Projects Expected to Provide Returns greater than their Respective Required Returns



2.2 Previous Empirical Studies

The other previous empirical studies are considered to be the secondary data for this research. These previous studies are considered relevant to the WACC. Different previous studies along with the relevant theories help the researcher to conceptualize researcher's particular interest in the framework.

Brennan, Michael J. (1973) studied a new look at the weighted average cost of capital.

Considering the appropriate definition of an enterprise's cost of capital for investment decision purposes, the enterprise is financing in such a way as to maintain the same capital structure measured in a book value terms. The market value weighted average cost is shown to be superior to the corresponding book value concept in imperfect capital markets, in which the enterprise has achieved an optimal capital structure. In perfect capital markets, the existence of a corporate income tax is shown to imply that neither book nor market value weighted measures of the cost of capital are appropriate.

Reilly, Raymond R. (1973) studied on the weighted average cost of capital.

The weighted average cost-of-capital is a widely used concept in the theoretical literature of finance as well as in the analysis of capital expenditure of business enterprises. The importance of the concept derives from its use as the cutoff point for investment in capital projects and as an indicator of optimal capital structures. Differences between the true overall average cost of capital and the true overall cost are typically attributed to deviations of market values from book values, changes in the proportional use of specific capital sources, or alterations in the risk characteristics of the stream of payments to owners and creditors. This empirical study abstracts from these problems to focus on the mathematical error of using weighted average costs-of-capital to represent the true overall capital cost.

Linke, Charles M. and Kim, Moon K. (1974) studied more on the weighted average cost of capital - a comment and analysis.

The mathematical difficulties encountered when attempting to express the internal rate-of-return (IRR) of a combination of two or more investments as a weighted algebraic sum of the individual investments, have been recognized in financial literature for some time. Recently, Reilly and Wecker applied the well-known mathematical impossibility of expressing the roots of a polynomial as an algebraic combination of the roots of related polynomials to question the validity of weighted cost-of-capital concepts. They concluded that the weighted cost of capital is a biased estimator of the true or overall capital cost and may lead to the establishment of erroneous investment cutoff points or a nonoptimal capital-structure. Despite the serious implications of their conclusions to received financial theory, they do not indicate the dimension or nature of the alleged bias of the estimator. Their analysis is incorrect.

Nantell, Timothy J. and Carlson, Robert C. (1975) studied the cost-of-capital as a weighted average.

The recent rash of criticisms of the modern weighted average formulation has not been useful. Much of the criticism arises from a failure to recognize that even with a generally accepted definition of the true cost-of-capital, innumerable specifications of this definition, all equally valid, are possible. A proof is presented showing that for the modern specification, the weighted-average cost of capital is minimized at the same capital structure that maximizes the value of the enterprise. As long as the cash flows are consistently specified, any one of a whole set of weighted-average cost of capital formulations is usable for making investment decisions. In general, it is concluded that the so-called modern weighted-average cost-of-capital

concept is valid for determining the optimal capital structure that maximizes the value of the enterprise.

Beranex, William (1975) studied the cost-of-capital, capital budgeting, and the maximization of shareholder wealth.

Analysis resolves several important issues. It implies the correctly defined net cash-flows to be used for budgeting purposes, and how under these assumptions to assess the appropriate MCC, including the weights of the capital costs. The solution is correct in the sense that it follows from axioms, including the objective of maximizing shareholder wealth. Three different definitions of the net cash-flow are investigated. Each led to a unique definition of the integral rate-of-return and, in turn, to an associated MCC. Difficulties of implementing this approach must be set forth as well as the ways in which they may be overcome. Alterations in the basic conditions should be investigated including among others, uneven cash-flows, use of different methods of income-tax depreciation and different methods of repaying debt, including, the important condition of a constant debt-equity ratio for finite investments.

Chen Beranek, William (1977) studied the weighted average cost of capital and shareholder wealth maximization.

A set of theorems was derived based on the following set of axioms:

1. Financial management seeks to maximize the wealth of existing shareholders.
2. All projects being considered at period zero are of one period duration and possess the attribute that their adoption or rejection by the enterprise will not affect the business risk of the enterprise's asset portfolio.

3. The ratio of debt to total book capital is given as 'a', 'r' and 'k' reflecting the enterprise's business and financial risk however perceived by investors. The net present value (NPV) of any project satisfying the above conditions could be evaluated for accept reject purposes with a cost of capital (CC) involving book weights. This cc yielded an NPV numerically equals to the NPV using market value weights under special circumstances.

Arditti, Fred D. and Levy, Haim (1977) studied the weighted average cost of capital as a cutoff rate: a critical analysis of the classical textbook weighted average.

Assuming that an enterprise has an optimal debt/equity ratio, most textbooks recommend using the weighted average cost of capital as a cutoff rate for investment decision-making. This misspecification implies that the capital structure that minimizes the weighted average after-tax cost of capital is a non-optimal one. Basically, there are 2 mistakes in these texts: one in defining the project's cash flow and one in defining the cost of capital. While these 2 mistakes may offset each other in some cases, presenting the enterprise with the correct accept-reject decision, generally the 2 mistakes do not cancel, and the textbook procedure lead the enterprise to an incorrect decision. Interest tax savings are not ignored in the formula presented in this study; it is proved that such savings are accounted for in the post-tax equity cost. Textbooks recommend that interest tax savings should be excluded from a project's cash flows.

Andrew H. (1978) studied recent developments in the cost of debt capital.

Recent developments in the theory of pricing risky debt are reviewed, and the determinants of the cost of debt capital are examined. A framework of a one-period capital asset pricing model under uncertainty is used to study the pricing of risky bonds and the determination of the cost of debt capital. The more mathematically complex models of pricing risky bonds are based on the continuous-time option pricing model. Determinants of the risk premiums on bonds based on the option pricing model are compared with those of the capital asset pricing model. The latter model is constructed to take into account the effects of corporate taxes and bankruptcy costs. Recent developments are noted in the theory of enterprise valuation and the cost of debt capital in a multi period context.

Ezzell, John R. and Porter, R. Burr (1979) studied correct specification of the cost of capital and net present value.

Recent articles by Arditti and Levy discount the applicability of textbook approaches to the cost of capital and net present value analyses. An analysis was conducted to evaluate the validity of their arguments. The framework used for the analysis is based on an equation that defines the value of the enterprise as the total payments made to owners and creditors. These payments are stated in terms of the discounted weighted average of their market yields. The analysis shows that basic inconsistencies exist with the Arditti and Levy approach to the net present value model. Specifically, in some cases a constant leverage is assumed whereas in other cases changes in debt are considered which imply changes in leverage. This analysis also reconfirms the validity of the standard textbook approach to problems involving weighted average cost of capital and net present value.

Ben-Horim, Moshe (1979) studied comment on the weighted average cost of capital as a cutoff rate.

Arditti and Levy have proposed a technique for analyzing weighted average cost of capital problems, which is different from the classical textbook methods. It is argued that when using their technique, the actual calculated net present value is different from what they state it should be. This difference results primarily because of the assumption that the target debt-value ratio is used to establish the amount of debt financing in the initial outlay. The debt-value ratio should be used in determining the debt in financing the resulting value. This conclusion was based on an analysis, which compared net present value of investment project calculations using the classical and Arditti and Levy methods. The analysis showed that only by assuming that the resulting value is financed by the target degree of leverage can a constant debt to value ratio be maintained.

Miles, James A. and Ezzell, John R. (1980) studied the weighted average cost of capital, perfect capital markets, and project life: a clarification.

The correct linkage is established between the riskiness of a enterprise's project investment, as embodied in the unlevered discount rate, and the riskiness of the future tax savings on interest payments when the market value leverage ratio is held constant. The linkage provides the foundation to establish the validity of the textbook weighted average cost of capital (WACC). A number of assumptions are made, and a model is derived for obtaining the value of a levered stream by discounting the unlevered stream by a single discount rate. The textbook approach is shown to be an implication of the Modigliani and Miller (MM) approach and is therefore a special case of Myers' MM-based APV (adjusted present value)

model. Results also demonstrate that the two polar sufficient assumptions regarding project life identified with the validity of the textbook WACC can be abandoned:

1. The project has a one-year life.
2. The project's cash flows are a level perpetuity. The critical assumption pertains to the enterprise's financing policy rather than project life.

Rege, Udayan P. and Baxter, George C. (1982) studied weighted average cost of capital: a tool for decision-making.

Weighted average cost of capital (WACC) is a means of computing cost of capital. In this research, three issues are considered in computing WACC for use as a cutoff rate for investment decisions - the issue of taxes, income versus cash flow, and market versus book value. Examples show that no matter how taxes are incorporated into the computation, as long as they are used consistently the investment decision is not affected. In addition, it is shown that either operating income or cash flow can be used, but different formulas are necessary. The values, market or book, which best approximate the debt and equity proportions in the enterprise's future capital structure should be used. The following steps can be used to operationalize WACC for investment decision-making:

1. Locate profitable investment opportunities (PIO).
2. Find alternative means of financing (AMF) the PIOs.
3. Link PIOs with AMFs to draw decision tree which will generate feasible alternatives.
4. Compute WACC for each of the feasible alternatives.
5. Use WACC to find the value of the enterprise and rank the alternatives.

Kincheloe, Stephen C. (1990) studied the weighted average cost of capital - the correct discount rate.

Two discounted cash flow (DCF) techniques are cited in the Appraisal of Real Estate, 9th Edition. In one, the market value estimate is derived by discounting the net cash flows by a single rate, the weighted average cost of capital (WACC). In the other, it is derived by discounting the equity cash flows by the equity yield rate and adding the present value of the debt. The correct discount rate for a real estate market-value DCF analysis is the pretax WACC as applied to prefinance cash flows. A principal advantage of employing the WACC is that it separates the investment and financing decisions. As long as the costs of debt and equity are held constant over the investment term and the proportion of debt diminishes and the proportion of equity increases, the implicit WACC increases over the investment period. Sophisticated investors employ the WACC for discounting prefinance cash flows, but discounting each capital source's cash flow by its respective cost results in an incorrect value estimate.

Goldenberg, David H. and Robin, Ashok J. (1991) studied the arbitrage pricing theory and cost-of-capital estimation: the case of electric utilities.

The capital asset pricing model (CAPM) and alternative arbitrage pricing theory (APT) methodologies used to estimate the cost of capital are compared. Data on 31 electric utilities over the period 1972-1982 are used to estimate the cost of capital for 1983 using the market model as well as variations within the APT. The results are supported by statistical tests based on pairwise comparisons of different sets of estimates. The statistical factors APT method is found to produce significantly different estimates depending on the number of factors specified and the set of

enterprises factor analyzed. *The use of macroeconomic factors such as inflation, interest rate, customer price index (CPI) or gross domestic product index (GDP) is explored,* and it is shown that this methodology has advantages over the statistical factors APT and the market model.

Booth, Laurence (1991) studied the influence of production technology on risk and the cost of capital.

Research has shown that an enterprise's cost of capital is a function of output uncertainty, market structure, and production technology. Theoretical results, in part, have provided the justification for specifying instrumental variables for determining the cost of capital for a division of an enterprise or a nontraded enterprise and for adjusting risk for nonstationarity. This line of research is continued by using a time-state-preference valuation model to examine how the enterprise's choice of technology and production method affects its equilibrium level of risk and, as a result, the enterprise's cost of capital. A fixed and flexible method of production is analyzed for an enterprise using a Cobb-Douglas production function. In both cases, it is found that risk and the cost of capital decrease with the level of capital intensity. Implications are drawn for the specification of empirical tests of the determinants of risk.

Clubb, Colin D. B. and Doran, Paul (1992) studied on the weighted average cost of capital with personal taxes.

The impact of personal taxation is considered on the Miles and Ezzell (1980) result that the weighted average cost of capital is the appropriate rate for discounting after corporation tax cash flows in a Modigliani and Miller (1958, 1963) perfect

capital market with corporation tax. An analogous result, incorporating a capital gains tax adjustment, is derived for the personal tax case, and its application to the UK tax system is considered. It has been shown that under assumptions as to the payment of capital gains tax, a modified form of the weighted average cost of capital (WACC) holds. In particular, for the UK tax system, post-corporation and personal tax WACC is found and then grossed up at the standard rate of tax.

Hardouvelis, Gikas A. and Wizman, Thierry A. (1992) studied the relative cost of capital for marginal enterprises over the business cycle.

The effects of the business cycle on the cost of capital faced by small, distressed enterprises and their larger, more financially secure counterparts are examined. The analysis draws on stock market returns data for a broad range of traded companies during the 1963-1991 period. The evidence suggests that *the business cycle has a differential impact on the costs of capital of enterprises grouped by the capital size, distress, and financial leverage*. From peak to trough of a recession, the premium in the cost of capital for the smallest over the largest enterprises increases by 329 basis points on a monthly basis. From trough to peak of an expansion, the same premium declines by 366 basis points. The change in the marginal enterprises' relative monthly cost of capital is attributable in part to a change in the cross-sectional sensitivity of the cost of capital to each of the 3 characteristics - market value, book-to-market equity, and debt-to-equity ratio - used in the study.

This article uses the expected rate of return on an enterprise's stock as a measure of the enterprise's cost of capital. To estimate the expected rate of return, the authors regress the realized real stock return of the enterprise on a parsimonious set of financial variables. The regression fit is a proxy for the enterprise's expected monthly

rate of return, or its short-run cost of capital. The short-run cost of capital affects a enterprise's decision to postpone a capital project and is also related to the long-term cost of capital if the short-run required rates of return show some persistence.

The weight of evidence suggests that the business cycle and the performance of the enterprise (measure by some financial ratio such as liquidity ratio, debt ratio, profitability and etc) has a differential impact on the costs of capital of enterprises grouped by size, distress, and financial leverage. From peak to trough of a recession, the premium in the cost of capital for the smallest over the largest enterprises--what we call the relative cost of capital--increases by 329 basis points on a monthly basis. From trough to peak of an expansion, the same premium declines by 366 basis points. Similar variations in the relative cost of capital are observed when enterprises are grouped according to other characteristics. For example, the premium of enterprises with negative earnings increases from peak to trough by 175 basis points and decreases from trough to peak by 205 basis points.

The change in the marginal enterprises relative monthly cost of capital is attributable in part to a change in the cross-sectional sensitivity of the cost of capital to each of the three characteristics--market value, book-to-market equity, debt-to-equity ratio--used as proxies for risk in this study. This sensitivity can be thought of as the price of risk, with the quantity of risk captured by the accounting variables. At business cycle peaks, a 1 percent increase in market equity leads to an average reduction in the cost of capital of 3 basis points. At business cycle troughs, however, a 1 percent increase in market value elicits a 54 basis point reduction in the cost of capital. The positive elasticity of the cost of capital to the debt-to-equity ratio also varies considerably across the cycle, rising threefold from peak to trough. The

sensitivity of the cost of capital to book-to-market equity follows a similar pattern, although its variability is less pronounced.

The regressions indicate that the asymmetric effects of the business cycle on marginal enterprises' cost of capital are not trivial. Therefore, it is appropriate to consider the broader economic consequences of these effects. First, such effects may be an important element in the propagation and duration of the business cycle. A sharp increase in the cost of capital to small, highly leveraged, or distressed enterprises could transform a decline in aggregate demand or some other shock to economic activity into a downturn large enough to be judged a recession. Second, the differential effect of the business cycle upon the cost of capital may influence industrial structure by promoting merger activity. Small, distressed, or highly levered enterprises that wish to overcome a competitive disadvantage in the market for capital during recessions may seek to merge so as to achieve a lower cost of capital. Such possible repercussions should prompt economists to look more closely at this issue.

Paulo, Stanley B. S. (1992) studied the weighted average cost of capital: a caveat.

The weighted average cost of capital (WACC) is subject to serious reservations if used as a capital budgeting discount rate. The net cash flow for purposes of capital budgeting subscribes to 4 fundamental principles. Apart from conflicting with these principles, there are other reasons that bring into question the validity of the WACC as a discount rate, namely:

1. Only marginal revenues and marginal costs are relevant to the determination of the net cash flow, and hence average, fixed, sunk, historic, pro-rata, and overhead costs and revenues are ignored.

2. Finance charges are not featured in the computation of the net cash flow since they are taken into account in the discount rate.
3. Working capital that is needed to support the optimal level of functioning of fixed assets frequently needs to be increased when a capital project is implemented.
4. WACC proponents have called for the exclusion of depreciation, a major source of internal equity finance, from the WACC. A discount rate based on sequential marginal costing will provide superior valuations to those based on the WACC.

WACCists have skillfully argued their cause. Sequentialists have not responded appropriately, but have retreated behind the argument of "financial process." An appropriate response should include the fact that, unlike WACCism which conflicts with the principles of capital budgeting, sequentialism does not conflict with these principles, especially that of ex-ante marginalism. Consequently, a discount rate based on sequential marginal costing will provide superior valuations to those based on the WACC.

Wang, Louie K. (1994) studied the weighted average cost of capital and sequential marginal costing: a clarification.

In a comment, Paulo's (1992) argument that the weighted average cost of capital (WACC) is subject to serious reservations if used as a capital budgeting discount rate is discussed. Paulo claims that a discount rate based on sequential marginal costing (SMC) will provide superior valuations to those based on the WACC. However, the comparison between the WACC and the SMC as presented by Paulo may not be appropriate. Paulo's arguments seem to contain some

misinterpretations about the WACC. The WACC is not ex-post, fixed average cost as he claims. Some of the critiques are directed to the functions that the WACC is not supposed to perform. Usually the WACC has been adjusted to become a proper discount rate in those situations.

The cost of capital is critical in the capital budgeting decisions. It is beyond the scope of this note to give a full discussion of the WACC. There are surely limitations and qualifications for its proper use. Paulo's critique would be more convincing if he had taken these into consideration.

Meanwhile, his arguments seem to contain some misinterpretations about the WACC. The WACC is certainly not ex-post, fixed average cost as he claims. Some of the critiques are directed to the functions that the WACC is not supposed to perform. And usually the WACC has been adjusted to become a proper discount rate in those situations.

Reservation also exists regarding to his conclusion of superiority of SMC approach even though he emphasizes that "financing takes place in large chunks of a specific component". As stated in Fundamentals of Corporate Finance [15, p. 444]: "The key fact to grasp is that the cost of capital associated with an investment depends on the systematic risk of that investment. In other words, the cost of capital depends primarily on the use of the funds, not the source."

Krueger Mark K. and Linke Charles M. (1994) studied a spanning approach for estimating divisional cost of capital.

The spanning approach, developed here for estimating a division's cost of capital, enjoys the advantages of both the analytical and pure-play techniques while minimizing their implementation problems. The spanning approach uses the linkage

between an asset's required return and the systematic variability of its cash flows. It is implemented by constructing portfolios of publicly traded companies that span the systematic cash flow variability of the division. Such a portfolio can be expected to have the same return as the division. Univariate and multivariate return series tests for a sample of 436 enterprises support the use of the linkage between systematic cash flow variability and asset returns to estimate the required return for divisions. Application of the spanning approach to the divisions of Hershey Foods demonstrates the way this technique helps resolve the problem of estimating divisional cost of capital.

Maruca, Regina Fazio (1996) studied the cost of capital.

Researchers from the University of Virginia's Darden Graduate School of Business Administration and from the University of Washington's Graduate School of Business say that although leading companies use the same general theoretical approaches to estimate the weighted average cost of capital (WACC), there is significant variation in practice when they calculate several key elements of the formula. That variation can lead to wide disparities in the resultant estimates of capital costs.

Dempsey, Mike (1998) studied the impact of personal taxes on the enterprise's weighted average cost of capital and investment behavior: a simplified approach using the Dempsey discounted dividends model.

The discounted dividends model advanced by Dempsey (1996) is extended to provide a weighted average cost of capital (WACC) assessment of investment opportunities with irregular cash flows. Thereafter, the framework is extended to an

assessment of the implications of government tax policy for the enterprise's investment behavior. The developed framework is consistent with the empirical evidence of Poterba and Summers (1985) which - over the period of UK tax history 1950-1983 encompassing 4 major tax equity reforms - observes how the related dividend and investment politics of UK enterprises appear to be influenced by the level of dividend taxes.

Heaton, Hal B. (1998) studied valuing small businesses: the cost of capital.

When valuing a small business, appraisers are often restricted to discounted cash flow approaches. Appraisers valuing small businesses will frequently use discounted cash flow analysis because data for the market comparison approach is unavailable and the cost approach ignores valuable intangible assets. In selecting a discount rate, appraisers must recognize the limited sources of capital available to small businesses and also adjust estimates obtained from market data on large, actively traded companies to reflect the risk, size, and illiquidity of small companies.

Bowes, Peter D. (1999) studied cost of capital: estimation and applications.

A book review is presented of Cost of Capital: Estimation and Applications by Shannon P. Pratt. It is amazing to see how similar business appraising and its concepts are to real estate appraising and its concepts. In some places the terminology and notations are different, but the uses and applications are the same.

Dr. Pratt writes in a gentle style, translating technical jargon into words we can understand and relate to. This book presents basic concepts and serves as an introduction to the subject. This allows real estate appraisers to understand and

appreciate the whys and wherefores and offers sources to pursue if we need more details. Concepts in the book to which real estate appraisers can relate include:

In some places, however, the formulas and arithmetic are more detailed than the level of the explanation. The discussion of risk relates to real estate as much as to cost of capital and business values. Appraisers can never get too much information about understanding, measuring, and adjusting for risk. The weighted average cost of capital is like the real estate appraiser's band of investment. Pratt says investors are risk-averse. This is a different concept. The author thinks investors match risk and return, and decide how much risk to accept based on return and other individual factors.

Minority control and marketability implications are important in real estate appraisal too. Real estate appraisers do not have to deal with these issues often and tend to struggle with them when they do. The introduction to concepts here is good information.

Pratt discusses common errors. Information about the strengths, weaknesses, and pitfalls of appraisal methods is always useful. He recommends that everything be balanced and consistent, which is a good advice. The author enjoyed Cost of Capital: Estimation and Applications because it concenterprised that the work of all appraisers, whether they appraise businesses or real estate, is similar - despite some word and notation differences. They can work around the differences to communicate well. The conenterpriseation of similar concepts that the author got from this book, however, though satisfying, was not enough in itself for the author to recommend this book as required reading for real estate appraisers.

Wojcik, Joanne (2002) studied understanding a company's cost of capital valuable.

WACC is an acronym for "weighted average cost of capital," or how much it costs a publicly traded company to raise cash, explained Scott Settje, an underwriting technical specialist at FM Global in Dallas, during a session at the Risk & Insurance Management Society Inc. annual conference, held April 14-18 in New Orleans. While the cost of capital is not directly related to risk management programs or insurance costs, risk managers who understand such financial terms can more easily capture the attention of corporate officers and directors.



Table 2.1: Summary of the previous studies.

Year	Author	Topic	Subject
1973	Brennan, Michael J.	A new look at the weighted average cost of capital	Definition of firm's cost of capital for investment decision purposes.
1973	Reilly, Raymond R.	The weighted average cost of capital	Using WACC concept in the theoretical literature of finance as well as in the analysis of capital expenditure of business enterprises.
1974	Linke, Charles M. and Kim, Moon K.	The weighted average cost of capital - a comment and analysis	Attempting to express IRR of a combination of two or more investments as a weighted algebraic sum of the individual investments.
1975	Nantell, Timothy J. and Carlson, Robert C.	The cost-of-capital as a weighted average	The recent rash of criticisms of the modern weighted average formulation.
1975	Beranex, William	The cost-of-capital, capital budgeting, and the maximization of shareholder wealth	Implying the correctly defined net cash-flows to be used for budgeting purposes, and how under these assumptions to include the weights of the capital costs.

Year	Author	Topic	Subject
1977	Chen Beranek, William	The weighted average cost of capital and shareholder wealth maximization	A set of theorems was derived based on the set of 3 axioms.
1977	Arditti, Fred D. and Levy, Haim	The weighted average cost of capital as a cutoff rate: a critical analysis of the classical textbook weighted average	Using the weighted average cost of capital as a cutoff rate for investment decision-making.
1978	Andrew H.	Recent developments in the cost of debt capital	Recent developments in the theory of pricing risky debt and the determinants of the cost of debt capital.
1979	Ezzell, John R. and Porter, R. Burr	Correct specification of the cost of capital and net present value	Reconenterprising the validity of the standard approach to problems involving weighted average cost of capital and net present value.
1979	Ben-Horim, Moshe	Comment on the weighted average cost of capital as a cutoff rate	Assuming that if the resulting value is financed by the target degree of leverage, a constant debt to value ratio can be maintained.

Year	Author	Topic	Subject
1980	Miles, James A. and Ezzell, John R.	The weighted average cost of capital, perfect capital markets, and project life: a clarification	The correct linkage is established between the riskiness of a enterprise's project investment, and the riskiness of the future tax savings on interest payments.
1982	Rege, Udayan P. and Baxter, George C.	Weighted average cost of capital: a tool for decision-making	Considering three issues in computing WACC for use as a cutoff rate for investment decisions.
1990	Kincheloe, Stephen C.	The weighted average cost of capital - the correct discount rate	Two discounted cash flow (DCF) techniques in real estate. The correct discount rate for a real estate market-value DCF analysis is the pretax WACC as applied to prefinance cash flows.
1991	Goldenberg, David H. and Robin, Ashok J.	The arbitrage pricing theory (APT) and cost-of-capital estimation: the case of electric utilities	APT method is found to produce significantly different estimates depending on the number of factors specified and the set of enterprises factor analyzed. The use of macroeconomic <u>factors such as inflation, interest rate, CPI or GDP is explored</u>

Year	Author	Topic	Subject
1991	Booth, Laurence	The influence of production technology on risk and the cost of capital	An enterprise's cost of capital is a function of output uncertainty, market structure, and production technology.
1992	Clubb, Colin D. B. and Doran, Paul	The weighted average cost of capital with personal taxes	Post-corporation and personal tax WACC is found and then grossed up at the standard rate of tax.
1992	Hardouvelis, Gikas A. and Wizman, Thierry A.	The relative cost of capital for marginal enterprises over the business cycle	<p>The business cycle has a differential <u>impact on the costs of capital of enterprises grouped by the capital size</u>, distress, and financial leverage.</p> <p>The weight of evidence suggests that the business cycle and the performance of the <u>enterprise (measure by some financial ratio such as liquidity ratio, debt ratio, profitability and etc)</u> has a differential impact on the costs of capital of enterprises grouped by size, distress, and financial leverage.</p>

Year	Author	Topic	Subject
1992	Paulo, Stanley B. S.	The weighted average cost of capital: a caveat.	WACC is subject to serious reservations if used as a capital budgeting discount rate. The net cash flow for purposes of capital budgeting subscribes to four fundamental principles.
1994	Wang, Louie K.	The weighted average cost of capital and sequential marginal costing: a clarification	<u>The cost of capital associated with an investment depends on the systematic risk</u> of that investment. The cost of capital depends primarily on the use of the funds, not the source.
1994	Krueger Mark K. and Linke Charles M.	A spanning approach for estimating divisional cost of capital	Explaining the spanning approach (using the linkage between an asset's required return and the systematic variability of its cash flows).
1996	Maruca, Regina Fazio	The cost of capital	Although using the same general theoretical approaches to estimate WACC, there is significant variation in practice when calculating several key elements of the formula.

Year	Author	Topic	Subject
1998	Dempsey, Mike	The impact of personal taxes on the enterprise's weighted average cost of capital and investment behavior: a simplified approach using the Dempsey discounted dividends model	The discounted dividends model advanced by Dempsey (1996) is extended to provide a weighted average cost of capital (WACC) assessment of investment opportunities with irregular cash flows.
1998	Heaton, Hal B.	Valuing small businesses: the cost of capital	When valuing a small business, appraisers are often restricted to discounted cash flow approaches.
1999	Bowes, Peter D.	Cost of capital: estimation and applications	To see how similar business appraising and its concepts.
2002	Wojcik, Joanne	Understanding a company's cost of capital valuable	Explaining WACC (how much it costs a publicly traded company to raise cash).

CHAPTER 3

RESEARCH FRAMEWORK

In this part of the study, the researcher draws the theories from the literature review to develop the conceptual framework of the research. This chapter comprises of four sections. Section one of this chapter is theoretical framework. It is logically developed, described, and elaborated network of associations among studied variables. Section two is conceptual framework that is the researcher's own framework explaining the independent and dependent variables. Section three is research hypotheses that are the statements specifying the relationship of variables that will be tested in this research. The last section is operationalization of related variables that describes conceptual definition, and operational definition.

3.1 Theoretical Framework

From the previous chapter, chapter 2 - review of related literature and studies, Goldenberg (1991) stated that the capital asset pricing model (CAPM) and alternative arbitrage pricing theory (APT) methodologies used to estimate the cost of capital are compared. Similarly in this study, the researcher applied the multiple regression model in order to find cost of capital or WACC. The researcher has drawn the theoretical framework to develop a conceptual model of the study. It discusses the relationship among the variables that are deemed to be integral to the dynamics of the situation being investigated. The researcher relates the theories of Cost of Capital in order to develop the conceptual framework. The independent variables of this research are External factors (inflation, GDP) and Company-Specific factors

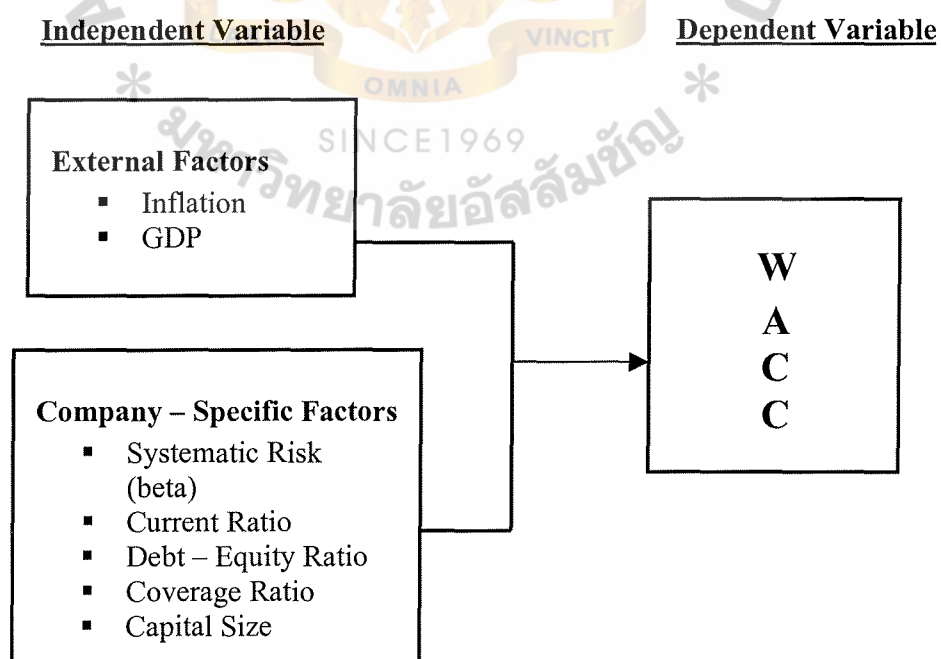
(systematic risk or beta, current ratio, coverage ratio and capital size). The dependent variable of this research is Weighted Average Cost of Capital or (WACC).

3.2 Conceptual Framework

Concepts are the basic building blocks of scientific investigation. They are creations of the human mind used in the classification and communication of the essence of some set of observations. A concept can be defined as an abstract idea generalized from particular facts. A concept can be directly tied to observable facts.

A conceptual framework is developed based on the previous empirical researches and relevant theories. The conceptual framework explicates the relationship between influencing factors, external and company – specific factors. The models are used as representations of theoretical systems so that the researcher can be tested, examined, and generally analyzed. Figure 3.1 depicted conceptual framework employed in this study.

Figure 3.1: Conceptual Framework



There are many factors that affect WACC, based on previous research studies as explained in literature review part. This study will emphasize on the External factors which compose of Inflation and GDP and the Company – Specific factors which consist of Systematic risk (beta), Current Ratio and Capital size which are considered as factors affecting WACC. Here, the framework is built to understand both the external factors and Company – Specific factors on WACC.

In the framework, the External factors include Inflation and GDP. The company – Specific factors consist of Systematic Risk (beta), Current Ratio, and Capital size. The main process, which is the WACC, is the dependent variable or the variable to be explained. External factors and Company – Specific factors are independent variables or the variables that influence the dependent variable.

3.3 Research Hypotheses

A hypothesis is an unproven proposition or supposition that tentatively explains certain facts or phenomena. It is a statement, an assumption, about the nature of the world. After the identification of the proper variables, the network of associations among the variables needs to be elaborated so that relevant hypothesis can be developed and subsequently tested. In this research, the results of hypothesis testing will bring about the conclusion. The problem can be solved as the findings of the research become evident. The researcher can classify research hypotheses into two groups are as follows:-

Research Question 1: Do the External factors relate to WACC?

H1_o: There is no relationship between *Inflation* and WACC.

H1_a: There is a relationship between *Inflation* and WACC.

H2₀: There is no relationship between *GDP* and WACC.

H2_a: There is a relationship between *GDP* and WACC.

Research Question 2: Do the Company – Specific factors relate to WACC?

H3₀: There is no relationship between *Systematic risk (beta)* and WACC.

H3_a: There is a relationship between *Systematic risk (beta)* and WACC.

H4₀: There is no relationship between *Current Ratio* and WACC.

H4_a: There is a relationship between *Current Ratio* and WACC.

H5₀: There is no relationship between *Debt to Equity Ratio* and WACC.

H5_a: There is a relationship between *Debt to Equity Ratio* and WACC.

H6₀: There is no relationship between *Coverage Ratio* and WACC.

H6_a: There is a relationship between *Coverage Ratio* and WACC.

H7₀: There is no relationship between *Capital Size* and WACC.

H7_a: There is a relationship between *Capital Size* and WACC.

3.4 Operationalization of the Independent and Dependent Variables

Before operationalization takes place, concepts must be defined first. Concepts are abstract ideas generalized from particular facts. Without concepts, there can be no theory (Davis and Cosenza, 1993). An operational definition gives meaning to a concept by specifying the activities or operations necessary to measure it.

The operational definition specifies what must be done to measure the concept under investigation. Operational definitions help the researcher to specify the rules for assigning numbers. The values assigned in the measuring process can be manipulated according to certain mathematical rules. Once the variables of interest have been identified and defined conceptually, a specific type of scale must be selected. In this research, Table 3.1 describes the measurement of each variable.

Table 3.1: Operational Definition of Influencing Variables

Concept	Conceptual Definition	Expectation	Level of Measurement
External factor: Inflation Rate	A sustained increase in the prices of all goods and services. - Data from Bank of Thailand website for the years 1994 to 2001.	▪ Relationship with WACC.	Ratio Scale
External factor: GDP Growth Rate	The sum of all goods and services produced within a nation's boundaries. - Data from Bank of Thailand website for the years 1994 to 2001.	▪ Relationship with WACC.	Ratio Scale

Concept	Conceptual Definition	Expectation	Level of Measurement
Company- Specific factor: Systematic Risk (beta)	A measure of the responsiveness of the excess returns for a security to those of the market. - Calculated by running regression model to find the slope of SET closing price index and Company closing price index year by year.	Relationship with WACC.	Ratio Scale
Company- Specific factor: Current Ratio	Calculated by dividing current assets by current liabilities, in order to measure the liquidity of the enterprise.	Relationship with WACC	Ratio Scale
Company- Specific factor: Debt to Equity Ratio	Calculated by dividing interest bearing debt to total equity, in order to measure the percentage of funds provided by creditor.	Relationship with WACC	Ratio Scale

Concept	Conceptual Definition	Expectation	Level of Measurement
Company-Specific factor: Coverage Ratio	Calculated by dividing earning before interest and taxes (EBIT) by interest expenses, in order to measure the ability of companies to pay interest expenses.	Relationship with WACC	Ratio Scale
Company-Specific factor: Capital size	Calculated by Neutral logarithm of the amount of the company capital both in debt and equity capital.	Relationship with WACC	Ratio Scale
Weighted Average Cost of Capital (WACC).	The cost of capital used to analyze capital budgeting decisions should be a weight average of the various components' cost. (Please see WACC calculation on Chapter two).	Relationship with Inflation, GDP, Systematic Risk, Current Ratio, Debt – Equity Ratio, Coverage Ratio and Capital size.	Ratio Scale

Table 3.2: Measurement of the Dependent Variable.

WACC Components	Calculation
$WACC = W_d K_d (1-T) + W_p K_p + W_e K_e$	
W_d = Weighted of Debt	Calculated by dividing interest bearing debt (IBD) by total market value, where IBD = OverDraft + Current portion of Longterm + Loans from & amount due to related parties + Longterm loans + Longterm Debt instruments. And total market value = IBD + Market value of Equity or MVE.
W_e = Weighted of Equity	Calculated by dividing MVE by total market value (IBD + MVE)
K_d = Cost of Debt	Calculated by dividing Interest expenses by average IBD, and average IBD = (IBD present year + IBD last year) divided by two.
K_e = Cost of Equity	Calculated by using CAPM model, $K_e = R_f + (\bar{R}_m - R_f) \beta_j$ (Equation 2-5). Gordon model can't be used because some companies don't pay the dividend and don't use cost of debt plus risk premium approach as the data isn't based on theoretically observation.

In this study, due to some company not issuing preferred stock, the researcher didn't include weighted of preferred stock and cost of preferred stock to calculate the WACC. Tax rate for communication corporations is 30%.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Research Methods Used

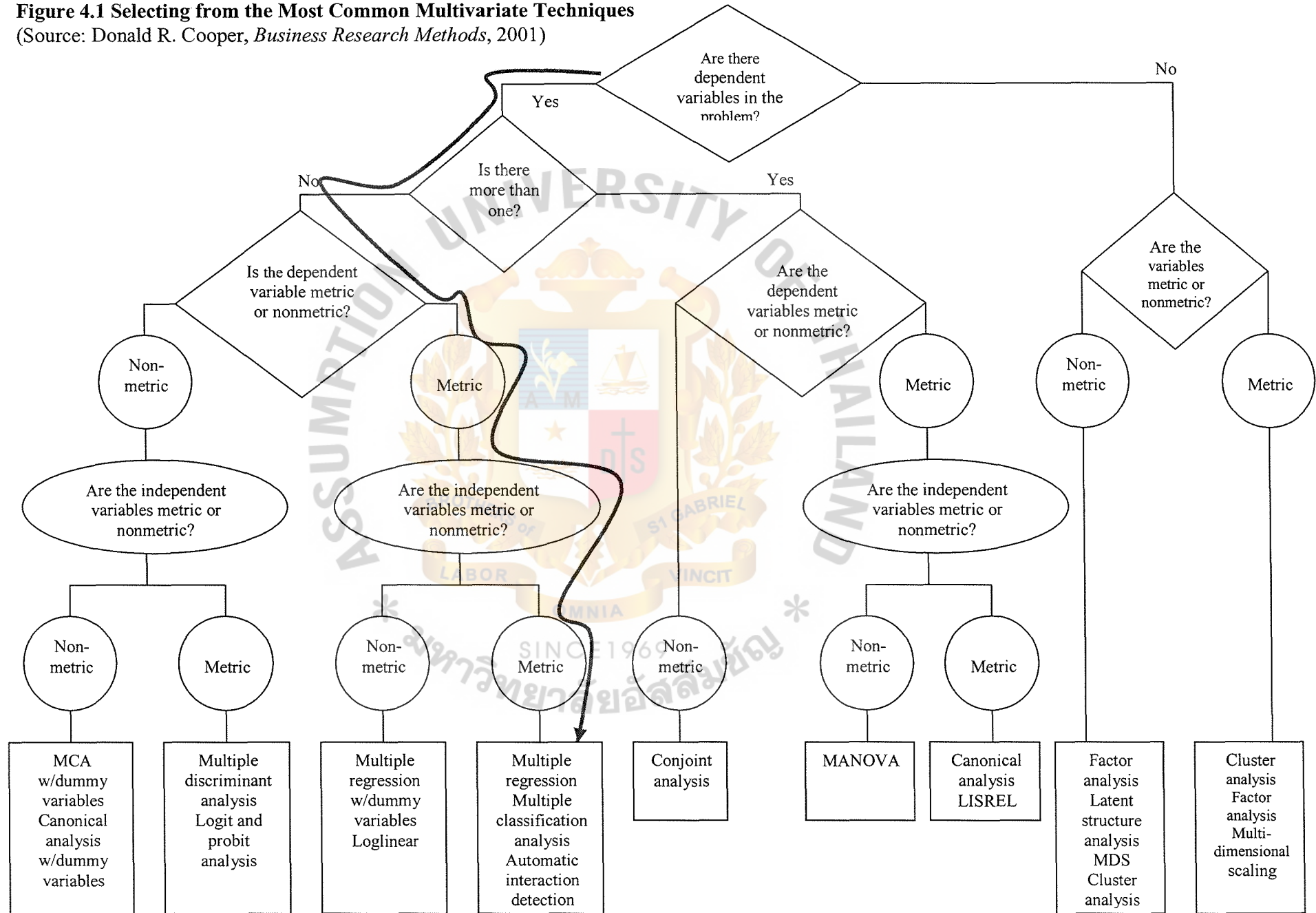
The first objective of this study is to study the factors that affect WACC of Thai Communication Corporations listed on SET. These factors are divided into the external factors and the company-specific factors. The second objective is to develop WACC regression models on the basis of accounting data by considering financial statement for Thai Communication Corporations listed on SET. In order to study those relationships between a single dependent variable and several independent variables, in this study, the researcher applied the “Multivariate Analysis”

In recent years, multivariate statistical tools have been applied with increasing frequency to research problems reference. This recognizes that many problems we encounter are more complex than the problems bivariate models can explain. Simultaneously, computer programs have taken advantage of the complex mathematics needed to manage multiple variable relationships. Today, computers with fast processing speeds and versatile software bring these powerful techniques to researchers. Throughout the functional areas of management, more and more problems are being addressed by considering multiple independent and/or multiple dependent variables. Sales managers' base forecasts on various product history variables; marketers consider the complex set of buyer preferences and preferred product options; financial analysts classify levels of credit risk based on a set of predictors; and human resource managers devise future wage and salary compensation plans with multivariate techniques.

Bereson and Levine (1999) defines multivariate analysis as “those statistical techniques which focus upon, and bring out in bold relief, the structure of simultaneous relationships among three or more phenomena.” Multivariate techniques may be classified as dependency and interdependency techniques. Selecting an appropriate technique starts with understanding of this distinction. If criterion and predictor variable exist in the research question, multiple regression, multivariate analysis of variance (MANOVA), and discriminant analysis are techniques where criterion or dependent variables and predictor or independent variable are present. Alternatively, if the variables are interrelated without designating some dependent and others independent, then interdependence of the variables is assumed. Factor analysis, cluster analysis, and multidimensional scaling are examples of the interdependency techniques.

Figure 4.1 provides a diagram to guide in the selection of techniques. Figure 4.1, refers to the first question “Are there dependent variables in the problem” for this research, and the answer is “Yes” and that dependent variable is WACC. This decision leads the researcher to the second question “Is the dependent variable more than one” and for this question the answer should be “No” because in this study there is only one dependent variable and that’s WACC. Moreover, in this research all the variables are metric measures therefore, the third and fourth question are “Is dependent variable metric or nonmetric” and “Are the independent variables metric or nonmetric” and the answer should be “metric”. Therefore the above mentioned reasons will lead the researcher to select “Multiple Regression Technique” in order to construct the regression model to study how significantly or sensitively of those independent variables affect WACC for Thai Communication Corporations listed on The Stock Exchange of Thailand (SET).

Figure 4.1 Selecting from the Most Common Multivariate Techniques
 (Source: Donald R. Cooper, *Business Research Methods*, 2001)



Multiple Regression

Multiple regression analysis is a statistical technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent (predictor) variables. The objective of multiple regression analysis is to use the independent variables whose values are known to predict the single dependent value selected by the researcher. Each predictor variable is weighted, and the weights denoting their relative contribution to the overall prediction. In calculating the weights, the regression analysis procedure ensures maximal prediction from the set of independent variables in the variate. These weights also facilitate interpretation as they influence of each variable in making the prediction, although correlation among the independent variables complicates the interpretative process. The set of weighted independent variables is also known as the *regression variate*, and a linear combination of the independent variables best predicts the dependent variable. The regression equation, also referred to as the regression variate, is the most widely known example of a variate among all the multivariate techniques.

Multiple regression analysis is a dependence technique. Thus, to use it, manager must be able to divide the variables into dependent and independent variables. Regression analysis is also a statistical tool that should be used only when both the dependent and independent variables are metric. However, under certain circumstances, it is possible to include nonmetric data for independent variables (by transforming either ordinal or nominal data with dummy-variable coding) or the dependent variable (by the use of a binary measure in the specialized technique of logistic regression). In summary, to apply multiple regression analysis,

1. The data must be metric or appropriately transformed.

2. Before deriving the regression equation, the researcher must decide which variable is to be dependent and which remaining variables will be independent.
3. The residual e variable should have a normal distribution
4. The independent variables are all independent to each other. (X_i and X_j should be independent).

Relating Independent to Dependent Variables with Regression

The objective of regression analysis is to predict a single dependent variable from the knowledge of one or more independent variables. When the problem involves a single independent variable, the statistical technique is called simple regression. When the problem involves two or more independent variables, it is called *multiple regression*. And the regression equation is represented as

$$y = b_o + b_1x_1 + b_2x_2 + \dots b_nx_n + \varepsilon \quad (4-1)$$

where

y = dependent variable, in this case, WACC

b_o = Y intercept

b_i = regression coefficient

x_i = independent variable i , where i is Inflation, GDP, Systematic risk or beta, Current ratio, Debt to equity ratio, Coverage ratio, and Capital size.

ε = An error term.

Because the researcher did not achieve perfect predictions of the dependent variable, the researcher would also like to estimate the range of predicted values that the researcher might expect, rather than relying just on the single (point) estimate. The point estimate is our best estimate of the dependent variable and can be shown to be

the average prediction for any given value of the independent variable. Using this point estimate, the researcher can calculate the range of predicted values based on a measure of the prediction errors we expect to make. Known as *the standard error of the estimate*, this measure in simple terms is the standard deviation of the prediction errors. The researcher can construct a confidence interval for a variable about its mean value by adding (plus and minus) a certain number of standard deviations. The standard error of the estimate (S_{yx}) is calculated by

$$\text{Standard Error of the Estimate } (S_{yx}) = \sqrt{\frac{\text{Sum of Squared Errors}}{\text{Sample Size} - 2}} \quad (4-2)$$

If the sum of squared errors represents a measure of our prediction errors, we should also be able to determine a measure of our prediction success, which we can term the sum of squares regression. Together, these two measures should equal the *total sum of squares*. The total sum of squares is based on the differences of the observations from the mean, the best prediction possible without using any additional variables that provides the baseline prediction. As the analyst adds independent variables, the total sum of squares can now be divided into (1) the sum of squares predicted by the independent variable(s), also known as the *sum of squares regression*, and (2) the sum of squared errors (SSE). The general formula for obtaining the sum of squared errors and the sum of squares regression is

$$\sum_{i=1}^n (y_i - \bar{y})^2 = \sum_{i=1}^n (y_i - \hat{y}_i)^2 + \sum_{i=1}^n (\hat{y}_i - \bar{y})^2 \quad (4-3)$$

$$\text{TSS} = \text{SSE} + \text{SSR}$$

$$\begin{array}{lcl} \text{Total Sum} & & \text{Sum of} \\ \text{of Squares} & = & \text{Squared} \\ & & \text{Error} \end{array} \quad \begin{array}{l} \text{Sum of Squares} \\ \text{Regression} \end{array}$$

where \bar{y} = average of all observations

y_i = value of individual observation

\hat{y}_i = predicted value for observation

Another way to express this level of prediction accuracy is the coefficient of determination (R^2), the ratio of the regression sum of squares to the total sum of squares as shown in the following equation:

$$\text{Coefficient of determination } (R^2) = \frac{\text{Sum of Squares Regression}}{\text{Total Sum of Squares}} \quad (4-4)$$

In the statistic, the coefficient of correlation (r) is often used to assess the relationship between Y and X . The sign of the correlation coefficient ($+r$, $-r$) denotes the slope of the regression line. However, the “strength” of the relationship is best represented by R^2 .

The ability of an additional independent variable to improve the prediction of the dependent variable is related not only to the correlation of the additional independent variable to the dependent variable but also the correlation(s) of the additional independent variable (s) to the independent variable (s) already in the regression equation. *Collinearity* is the association, measured as the correlation, between two independent variables. *Multicollinearity* refers to the correlation among three or more independent variables (evidenced when one is regressed against the others). Although there is a precise distinction in statistical terms, it is rather a common practice to use the terms interchangeably.

The impact of multicollinearity is to reduce any individual independent variable's predictive power by the extent to which it is associated with the other independent variables. For example, assume that one independent variable (X_1) has a correlation with the dependent variable .60 and a second independent variable (X_2) has a correlation of .50. Then X_1 would explain 36 percent (obtained by squaring the

correlation of .60) of the variance of the dependent variable, and X_2 would explain 25 percent (correlation of .50 squared). If the two independent variables are not correlated with each other at all, there is no “overlap,” or sharing, of their predictive power. The total explanation would be their sum of 51 percent. But as collinearity increases, there is some “sharing” of predictive power and the collective predictive power of the independent variables decreases.

Moreover, a test of hypothesis was performed on the slope in a simple linear regression model to determine the significance of the relationship between X and Y . In addition, a confidence interval was used to estimate the population slope. In this section these procedures will be extended to situations involving multiple regression.

Test of Hypothesis

To test the hypothesis the researcher used Equation (4-5):

$$t = \frac{b_1}{S_{b_1}} \quad (4-5)$$

However, this equation can be generalized for multiple regression as follows:

Testing for the Slope in Multiple Regression

$$t = \frac{b_k}{S_{b_k}}$$

where

- p = number of explanatory variables in the regression equation
- b_k = slope of variable k with Y holding constant the effects of all other independent variables
- S_{b_k} = standard error of the regression coefficient b_k
- t = test statistic for a t distribution with $n-p-1$ degrees of freedom

And will reject H_0 when t from calculation $< t$ from table with degree of freedom or P value < 0.05 .

Explanation with Multiple Regression

Multiple regression provides a means of objectively assessing the degree and character of the relationship between dependent and independent variables by forming the variate of independent variables. The independent variables, in addition to their collective prediction through the dependent variable, may also be considered for their individual contribution to the variate and its predictions. Interpretation of the variate may rely on any of the three perspectives: the importance of the independent variables, the types of relationship found, or the interrelationships among the independent variables.

1. The most direct interpretation of the regression variate is a determination of the relative importance of each independent variable in the prediction of the dependent measure. In all applications, the selection of independent variables should be based on their theoretical relationships to the dependent variable. Regression analysis then provides a means of objectively assessing the magnitude and direction (positive or negative) of each independent variable's relationship. The multivariate character of multiple regression that differentiates it from its univariate counterparts is the simultaneous assessment of relationships between each independent variable and the dependent measure. In making this simultaneous assessment, the relative importance of each predictor is determined.
2. In addition to assessing the importance of each variable, multiple regression also affords the analyst a means of assessing the nature of the relationships between the predictors and the dependent variable. The assumed relationship

is a linear association based on the correlations among the independent variables and the dependent measure. But transformations are also available to assess whether other types of relationships exist, particularly curvilinear relationships. This flexibility ensures that the analyst may examine the true nature of the relationship beyond the assumed linear relationship.

3. Finally, multiple regression also provides insight into the relationships among independent variables in their prediction of the dependent measure. These interrelationships are important for two reasons. First, correlation among the independent variables may make some variables redundant in the predictive effort. As such, they are not needed to produce the optimal prediction. This does not reflect their individual relationships with the dependent variable but instead indicates that in a multivariate context, they are not needed if another set of independent variables explaining this variance is employed. The analyst must guard against determining the importance of independent variables based solely on the derived variate, because relationships among the independent variables may “mask” relationships that are not needed for predictive purposes but that represent substantive findings nonetheless. The interrelationships among variables can extend not only to their predictive power but also to interrelationships among their estimated effects. This is best seen when one independent variable’s effect is contingent on another independent variable. Multiple regression provides diagnostic analyses that can determine whether such effects exist based on empirical or theoretical rationale.

4.2 Respondents and Sampling Procedures

Target population

In this study, the target population of this research is made up of the ten communication companies in Thailand that are listed on The Stock Exchange Thailand (SET), and the ten companies are as follows: 1. Advanced Info Service Public Company Limited (ADVANC), 2. The International Engineering Public Company Limited (IEC), 3. Jasmine International Public Company Limited (JASMN), 4. Samart Corporation Public Company Limited (SAMART), 5. Samart Telecoms Public Company Limited (SAMTEL), 6. Shinawatra Satellite Company Limited (SATTEL), 7. Shin Corporation Public Company Limited (SHIN), 8. Telecomasia Corporation Public Company Limited (TA), 9. Thai Telephone & Telecommunication Public Company Limited (TT&T), 10. United Communication Industry Public Company Limited (UCOM).

The data are restricted by ISIMS (Integrated – SET Information Management System) CD ROM in the period from the years 1994 to 2001., and the researcher selected only the Communication Corporation group due to differences in accounting procedure or taxation rate for different business that affect the transaction as reported in financial statements.

Sampling Procedure

The sample size used in multiple regression is perhaps the most influential single element under the control of the analyst in designing the analysis. The effects of sample size are seen most directly in the statistical power of the significance testing and the generalizability of the result. In this research, all calculation is measured

based on the financial statement, and this secondary data collection technique used in the present investigation was gathered from The Stock Exchange of Thailand Listed Company Information CD-ROM database volume 1, 2, and 3 from year 1994 – 2001, which contains the year – end balance sheets and income statements for all listed companies in the SET. Only Communication enterprises are the target population in this analysis. The size of the sample has a direct impact on the appropriateness and the statistical power of multiple regression. Small samples, usually characterized as having fewer than 20 observations, are appropriate only for analysis by simple regression with a single independent variable. Even in these situations, only very strong relationships can be detected with any degree of certainty. Likewise, very large samples of 1,000 observations or more make the statistical significance tests overly sensitive, indicating that almost any relationship is statistically significant. With very large samples the analyst must ensure that the criteria of practical significance are met along with statistical significance.

In addition to sample size's role in determining statistical power, it also affects the generalizability of the results by the ratio of observations to independent variables. A general rule is that the ratio should never fall below five, meaning that there should be five observations for each independent variable in the variate. If this ratio falls below five, the analyst encounters the risk of "over fitting" the variate to the sample, making the results too specific to the sample and thus lacking generalizability. While the minimum ratio is 5 to 1, the desired level is between 15 to 20 observations for each independent variable. When this level is reached, the results should be generalizable if the sample is representative. However, if a stepwise procedure is employed (discussed in stage four under model estimation approaches), the recommended level increases to 50 to 1. In cases when the available sample does not

meet these criteria, the analyst should be certain to validate the generalizability of the results. In this study there are 80 observations for each independent variable.

4.3 Research Instruments

In this study, the financial data is used in computation for each company from year 1994 – 2001 based from The Stock Exchange of Thailand Listed Company Information CD-ROM database volume 1, 2, and 3. Moreover, the regression model that represented the factors affects WACC constructed by using Multiple Regression Analysis in order to analyze the relationship between a single dependent variable and several independent variables.

4.4 Collection Data

The collection of data for measuring WACC and any independent variables in order to study the relationship between WACC and factors influencing WACC is measured based on the financial statement, and this secondary data collection technique used in the present investigation was gathered from The Stock Exchange of Thailand Listed Company Information CD-ROM database volume 1, 2, and 3 from year 1994 – 2001, which contains the year – end balance sheets and income statements for all listed companies in the SET. Only Communication enterprises are the target population in this analysis and they are as follows:-

1. Advanced Info Service Public Company Limited (ADVANC).
2. The International Engineering Public Company Limited (IEC).
3. Jasmine International Public Company Limited (JASMN).
4. Samart Corporation Public Company Limited (SAMART).
5. Samart Telecoms Public Company Limited (SAMTEL).

6. Shinawatra Satellite Company Limited (SATTEL).
7. Shin Corporation Public Company Limited (SHIN).
8. Telecomasia Corporation Public Company Limited (TA).
9. Thai Telephone & Telecommunication Public Company Limited (TT&T).
10. United Communication Industry Public Company Limited (UCOM).

4.5 Statistical Treatment of Data

This study employs the Multiple Regression Analysis method in predicting a determination of the relative importance of each independent variable in the prediction of the dependent measure. The SPSS program is used for all models.



CHAPTER 5

PRESENTATION OF DATA AND
CRITICAL DISCUSSION OF RESULTS

This chapter reports the empirical results on the multiple regression model.

The researcher separates it into two parts. Part one reports and discusses the results of the regression model for the dependent variable, WACC and independent variables, Inflation rate, GDP, Systematic risk or Beta, Current ratio, Debt – Equity ratio, Coverage ratio, and Capital size. Part two reports and discusses the results of testing hypothesis for studying the relationship between the independent variables and dependent variable, WACC.

5.1 The Multiple Regression Model

Table 5.1: Dependent and Independent Variables

Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
1.6	1.8	0.0613	0.94	1.23	7.40	11.64	4.2459
1.6	4.6	1.6428	1.22	0.49	15.92	10.99	13.5973
0.3	4.4	0.6627	0.87	0.33	7.63	10.59	11.1180
8.1	-10.5	1.5890	0.51	0.93	4.83	10.63	18.0156
5.6	-1.4	1.6303	0.73	0.83	10.86	10.47	20.0992
5.9	5.9	2.1182	0.79	0.23	21.89	9.99	24.1260
5.8	9.2	0.6044	1.04	0.51	14.94	9.91	17.5942
5.0	9.0	0.0073	1.28	0.80	10.54	9.65	18.7533
1.6	1.8	7.6541	3.13	0.14	-1.51	7.73	31.7785
1.6	4.6	22.0666	0.81	0.51	-0.58	7.77	40.9974
0.3	4.4	8.9030	0.37	4.72	-0.08	7.88	20.8125
8.1	-10.5	40.3208	0.40	3.85	1.53	8.24	23.6139
5.6	-1.4	5.6544	0.87	6.99	-1.62	8.48	7.4344
5.9	5.9	5.4402	0.84	0.86	3.15	8.94	25.3106
5.8	9.2	0.8148	1.67	0.95	3.11	8.62	15.5191
5.0	9.0	-0.1231	1.37	0.45	19.43	8.02	16.9079
1.6	1.8	3.8052	0.62	16.55	1.61	9.80	7.7238

Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
1.6	4.6	8.2630	1.47	65.40	0.56	9.89	12.9759
0.3	4.4	5.6004	1.07	3.23	-1.00	10.13	20.3627
8.1	-10.5	11.6491	0.70	1.75	1.44	10.16	26.0553
5.6	-1.4	13.3339	1.00	1.43	0.05	10.07	38.6153
5.9	5.9	6.7012	1.37	0.44	2.87	10.03	38.3980
5.8	9.2	-0.0151	1.27	0.38	5.45	9.74	14.1202
5.0	9.0	0.9416	1.10	0.42	2.72	9.41	22.8791
1.6	1.8	4.0021	0.84	-46.26	1.24	8.96	9.6295
1.6	4.6	5.8090	0.91	-5.40	4.27	9.33	8.3336
0.3	4.4	2.9925	0.84	-11.26	-0.49	9.43	8.7860
8.1	-10.5	12.4743	0.35	6.67	0.42	9.94	8.4746
5.6	-1.4	3.8511	0.77	8.31	-0.33	9.67	12.2208
5.9	5.9	7.8196	0.88	1.70	2.72	9.37	33.6451
5.8	9.2	3.6674	0.95	1.16	3.85	8.87	27.0335
5.0	9.0	0.8414	0.93	1.55	4.46	8.37	20.0139
1.6	1.8	4.6193	2.97	0.62	-0.22	7.94	18.1576
1.6	4.6	9.1869	3.30	0.75	1.57	8.13	28.1598
0.3	4.4	4.6156	4.11	0.68	0.88	8.28	26.1897
8.1	-10.5	18.0973	4.25	0.77	1.19	8.42	45.9005
5.6	-1.4	6.8850	5.39	0.63	2.34	8.36	28.1976
5.9	5.9	12.2600	5.67	0.07	5.56	7.58	71.6394
5.8	9.2	9.2774	2.32	0.88	2.94	6.79	55.5755
5.0	9.0	9.2774	1.88	1.23	2.40	6.66	59.2345
1.6	1.8	5.6672	2.06	1.12	5.38	9.57	21.6601
1.6	4.6	12.3173	2.07	1.33	2.45	9.38	42.1375
0.3	4.4	8.7530	2.57	1.44	1.47	9.32	39.2735
8.1	-10.5	7.6522	10.16	3.38	3.61	9.32	24.9098
5.6	-1.4	12.2384	12.46	21.96	0.20	9.51	10.4222
5.9	5.9	27.4663	32.89	0.47	2.22	9.55	23.3905
5.8	9.2	8.1381	76.16	0.27	3.64	9.34	50.4191
5.0	9.0	2.9145	10.72	0.29	-0.50	8.79	31.0202
1.6	1.8	0.1482	0.37	0.57	6.18	10.63	5.2235
1.6	4.6	1.0963	0.50	0.56	4.62	10.54	10.9695
0.3	4.4	0.5287	0.84	0.56	12.18	10.15	10.4730
8.1	-10.5	1.6070	0.44	10.84	2.14	10.96	17.0890
5.6	-1.4	2.2255	0.55	9.29	3.49	11.00	20.0450
5.9	5.9	1.2867	0.95	0.52	8.05	10.72	19.9568
5.8	9.2	0.7852	1.44	0.69	8.76	10.59	18.4686
5.0	9.0	1.0350	1.27	0.77	11.47	10.32	23.7454
1.6	1.8	1.9975	1.16	14.71	0.28	11.37	7.7453
1.6	4.6	4.7642	2.23	8.08	0.19	11.39	14.7481
0.3	4.4	5.5997	0.17	4.43	-0.06	11.50	25.7224
8.1	-10.5	19.8379	0.24	3.35	2.33	11.56	43.0713
5.6	-1.4	10.3501	0.34	8.40	0.31	11.54	19.3308
5.9	5.9	11.0610	0.66	0.74	0.50	11.48	56.7366
5.8	9.2	3.0302	1.05	0.44	2.14	11.26	27.4512
5.0	9.0	3.6689	1.36	0.35	2.70	10.94	34.2229
1.6	1.8	17.6811	1.78	2.93	0.23	10.72	22.8962
1.6	4.6	18.8663	0.10	8.45	-0.55	10.84	19.3875
0.3	4.4	15.8529	0.10	3.36	0.14	10.86	37.7097

Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
8.1	-10.5	35.9045	0.23	2.48	1.17	10.92	43.9311
5.6	-1.4	18.0111	0.27	3.06	-0.46	10.97	19.9530
5.9	5.9	3.9781	0.87	0.01	1.63	10.79	32.9588
5.8	9.2	2.0662	1.07	0.0002	3.24	10.33	24.7861
5.0	9.0	4.4831	2.14	0.0014	1.71	10.11	41.1434
1.6	1.8	0.9864	1.19	1.19	3.40	9.90	7.9194
1.6	4.6	4.2250	1.34	1.91	3.16	9.92	19.9282
0.3	4.4	7.2196	1.79	14.67	-0.22	11.23	16.2639
8.1	-10.5	8.3775	1.30	11.22	3.14	11.36	9.8533
5.6	-1.4	2.6117	0.93	85.07	1.59	11.54	4.8377
5.9	5.9	2.7983	2.05	3.03	3.90	11.19	12.2932
5.8	9.2	1.9060	1.73	0.65	6.46	10.72	20.9037
5.0	9.0	0.7370	0.88	1.03	12.39	9.87	19.2152

Table 5.1 shows the entire figure of Dependent (WACC) and Independent variables for 10 communication companies which are: AIS, IEC, JASMIN, SMART, SAMTEL, SATTEL, SHIN, TA, TT&T and UCOM for years 1994 to years 2001. In this table the researcher applies the multiple regression technique to study the factors that affect WACC and develop WACC regression models of Thai Communication Corporations listed on The Stock Exchange of Thailand.

Table 5.2 Model Summary^a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.404 ^a	.164	.153	12.69055	.164	15.256	1	78	.000	1.798
2	.526 ^b	.277	.258	11.87529	.113	12.077	1	77	.001	
3	.601 ^c	.362	.336	11.23243	.085	10.066	1	76	.002	
4	.636 ^d	.405	.373	10.91928	.043	5.422	1	75	.023	

a. Predictors: (Constant), Systematic Risk

b. Predictors: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

The meaning of table 5.2: Model Summary

- | | |
|------------|--|
| • R Square | WACC can be explained by Inflation rate, GDP, Systematic |
|------------|--|

	Risk, Current Ratio, and Debt – Equity Ratio, Coverage Ratio, and Capital size with 40.5 %
• Standard Error of the estimate	This is standard error for predicting the value of WACC. That is 10.92 %
• Durbin - Watson	Durbin – Watson value is 1.798 (the value between 1.5 and 2.5). Therefore, the independent variables are all independent.

Table 5.3 **ANOVA^e**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2457.025	1	2457.025	15.256	.000 ^a
	Residual	12561.90	78	161.050		
	Total	15018.93	79			
2	Regression	4160.190	2	2080.095	14.750	.000 ^b
	Residual	10858.74	77	141.023		
	Total	15018.93	79			
3	Regression	5430.202	3	1810.067	14.347	.000 ^c
	Residual	9588.724	76	126.167		
	Total	15018.93	79			
4	Regression	6076.630	4	1519.157	12.741	.000 ^d
	Residual	8942.296	75	119.231		
	Total	15018.93	79			

a. Predictors: (Constant), Systematic Risk

b. Predictors: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

The meaning of table 5.3: ANOVA

• MSR and MSE	$MSR = \frac{6076.630}{4} = 1519.157$ and $MSE = \frac{8942.930}{75} = 119.231$
• Test Statistic F $F = \frac{MSR}{MSE}$	$F = \frac{1519.157}{119.231} = 12.741$ or Significant ($F > 12.741$) = .000, This mean that Significant .000 < 0.05. Therefore there is at least one variable that has a relationship with WACC.

Table 5.4 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	18.693	1.930		9.684	.000		
	Systematic Risk	.724	.185	.404	3.906	.000	1.000	1.000
2	(Constant)	14.086	2.241		6.287	.000		
	Systematic Risk	1.027	.194	.574	5.291	.000	.798	1.253
	GDP Growth (%)	.858	.247	.377	3.475	.001	.798	1.253
3	(Constant)	6.409	3.217		1.993	.050		
	Systematic Risk	1.001	.184	.559	5.447	.000	.796	1.256
	GDP Growth (%)	1.108	.246	.487	4.496	.000	.716	1.396
	Inflation Rate (%)	1.685	.531	.314	3.173	.002	.860	1.162
4	(Constant)	32.066	11.454		2.800	.007		
	Systematic Risk	.904	.184	.505	4.924	.000	.755	1.325
	GDP Growth (%)	.958	.248	.421	3.866	.000	.668	1.496
	Inflation Rate (%)	1.649	.517	.307	3.192	.002	.860	1.163
	Capital Size	-2.479	1.065	-.217	-2.328	.023	.916	1.091

a. Dependent Variable: Weighted Average Cost of Capital

Table 5.5 Excluded Variables^a

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Inflation Rate (%)	.171 ^a	1.638	.106	.183	.958	1.043	.958
	GDP Growth (%)	.377 ^a	3.475	.001	.368	.798	1.253	.798
	Current Ratio	.183 ^a	1.778	.079	.199	.983	1.017	.983
	Debt-Equity Ratio	-.200 ^a	-1.962	.053	-.218	1.000	1.000	1.000
	Coverage Ratio	.019 ^a	.164	.870	.019	.835	1.197	.835
	Capital Size	-.299 ^a	-3.013	.004	-.325	.985	1.015	.985
2	Inflation Rate (%)	.314 ^b	3.173	.002	.342	.860	1.162	.716
	Current Ratio	.120 ^b	1.209	.230	.137	.944	1.059	.764
	Debt-Equity Ratio	-.152 ^b	-1.567	.121	-.177	.977	1.024	.780
	Coverage Ratio	-.024 ^b	-.223	.824	-.026	.824	1.213	.712
	Capital Size	-.226 ^b	-2.291	.025	-.254	.917	1.090	.743
3	Current Ratio	.073 ^c	.761	.449	.088	.919	1.089	.675
	Debt-Equity Ratio	-.149 ^c	-1.626	.108	-.185	.977	1.024	.701
	Coverage Ratio	-.118 ^c	-1.130	.262	-.129	.765	1.307	.688
	Capital Size	-.217 ^c	-2.328	.023	-.260	.916	1.091	.668
4	Current Ratio	.060 ^d	.640	.524	.074	.915	1.093	.636
	Debt-Equity Ratio	-.111 ^d	-1.211	.230	-.139	.936	1.068	.663
	Coverage Ratio	-.106 ^d	-1.043	.300	-.120	.763	1.310	.640

a. Predictors in the Model: (Constant), Systematic Risk

b. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

The meaning of table 5.4 and 5.5: Coefficients and Excluded Variables

<ul style="list-style-type: none"> Unstandardized Coefficient, B 	<p>B is the coefficient of the multiple regression model, that's $b_0, b_1, b_2, \dots, b_n$ from $y = b_0 + b_1x_1 + b_2x_2 + \dots b_nx_n + \varepsilon$. So WACC regression model should be WACC = 32.066 + 1.649(Inflation Rate) + 0.958(GDP Growth) + 0.904(Systematic Risk) - 2.479(Capital Size) + 10.92</p>
<ul style="list-style-type: none"> Standard Error 	<p>This stand error is mean standard error for each coefficient of each independent variable.</p>
<ul style="list-style-type: none"> Standardized Coefficient, Beta 	<p>There is no unit for this Beta. It means if an independent variable has a high beta, that independent variable will have a strong relationship with WACC than the one with a low beta. Beta for Inflation Rate = 0.327, GDP = 0.421, Systematic risk = 0.505, and Capital Size = -0.217.</p>
<ul style="list-style-type: none"> Tolerance and VIF. 	<p>If the tolerance ($1-R_i^2$) of an independent variable is lower than 0.5, that independent variable will have a relationship with others independent variables. And if VIF (Variance Inflation Factor) or $1/(1-R_i^2)$ for an independent variable is greater than 2.0, that independent variable will have a relationship with others independent variables as well. From table 5.4 and 5.5 show that there is no Tolerance values less than 0.5 or VIF values greater than 2.0.</p>
<ul style="list-style-type: none"> Excluded Variables 	<p>From table 5.5, can observe that significant of t-statistic for Current Ratio, Debt to Equity Ratio and Coverage Ratio are greater than 0.05. Therefore, these three variables are not statically significant at 5 % level to include in the WACC regression model.</p>

Table 5.6 **Descriptive Statistics**

	Mean	Std. Deviation	N
Weigthed Average Cost of Capital	23.8057	13.78815	80
Inflation Rate (%)	4.2375	2.56507	80
GDP Growth (%)	2.8750	6.06186	80
Systematic Risk	7.0610	7.70272	80
Current Ratio	3.0279	9.23964	80
Debt-Equity Ratio	3.8643	13.62958	80
Coverage Ratio	3.6077	4.63942	80
Capital Size	9.8360	1.20531	80

Table 5.7 **Residuals Statistics^a**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7.6274	51.3765	23.8057	8.77037	80
Std. Predicted Value	-1.845	3.144	.000	1.000	80
Standard Error of Predicted Value	1.65476	5.61030	2.62872	.74067	80
Adjusted Predicted Value	7.8581	61.3343	23.8452	9.26827	80
Residual	-27.7626	31.9012	.0000	10.63925	80
Std. Residual	-2.543	2.922	.000	.974	80
Stud. Residual	-2.964	3.030	-.001	1.024	80
Deleted Residual	-37.7203	34.3051	-.0395	11.77869	80
Stud. Deleted Residual	-3.133	3.212	.000	1.046	80
Mahal. Distance	.827	19.868	3.950	3.211	80
Cook's Distance	.000	.630	.023	.077	80
Centered Leverage Value	.010	.251	.050	.041	80

a. Dependent Variable: Weigthed Average Cost of Capital

The meaning of table 5.6 and 5.7: Descriptive and Residuals Statistics

• Predicted Value	The approximate of predicted WACC figures, which have Minimum of WACC, is 7.63 %, Maximum WACC is 51.3765 %, Mean of WACC is 23, and Standard Deviation is 8.77 %.
• Std. Residuals	Maximum should not exceed more than 3.0 In this study; Maximum of this Std. Residuals is 2.922 (less than 3.0). This implies that all data used for regression model are normal.

Figure 5.1 and 5.2: Show the dependent variable (WACC) that has normal distribution.

Histogram

Dependent Variable: Weighed Average Cost of Capital

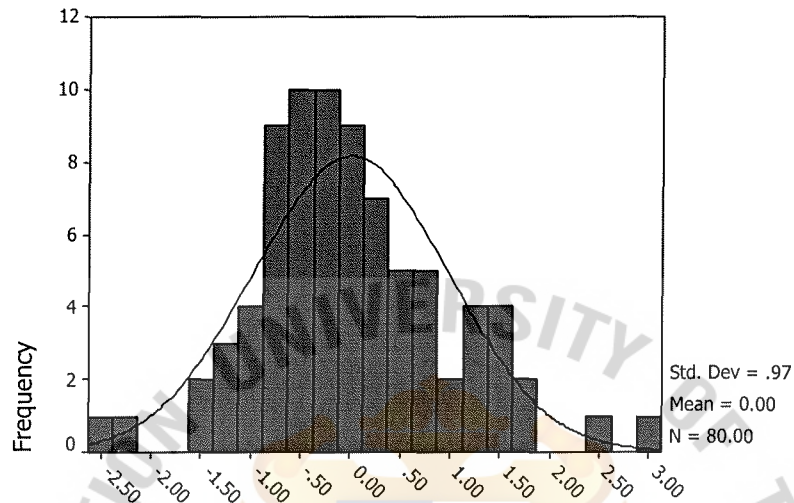


Figure 5.1: Histogram for WACC

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Weighed Average Cost of Capital

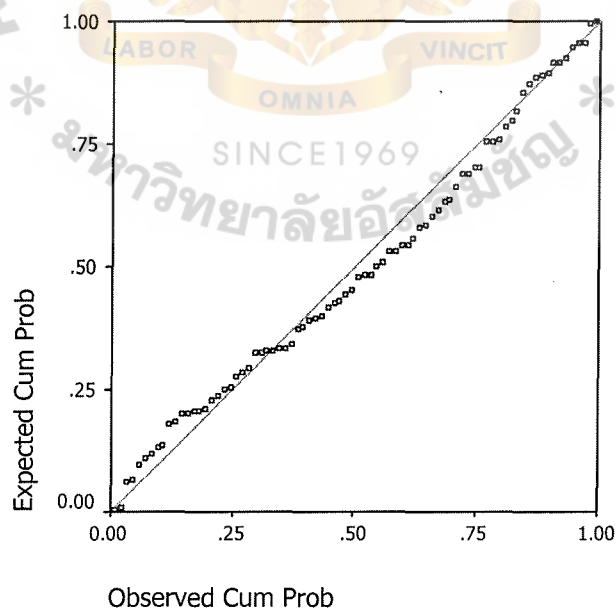


Figure 5.2: Normal P-P Plot of WACC

5.2 Testing Hypothesis

Inflation Rate

H1₀: $b_1 = 0$ There is no relationship between *Inflation* factor and WACC.

H1_a: $b_1 \neq 0$ There is a relationship between *Inflation* factor and WACC.

According to table 5.4, the value of Significance (2-tailed) is 0.002 and that is less than 0.05. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It implies that there is a relationship between Inflation Rate factor and WACC with 95 % confidence or it is statistically significant at 5 % level.

GDP Growth Rate

H2₀: $b_2 = 0$ There is no relationship between *GDP* factor and WACC.

H2_a: $b_2 \neq 0$ There is a relationship between *GDP* factor and WACC.

According to table 5.4, the value of Significance (2-tailed) is 0.000 and that is less than 0.05. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It implies that there is a relationship between GDP factor and WACC with 95 % confidence or it is statistically significant at 5 % level.

Systematic Risk (Beta)

H3₀: $b_3 = 0$ There is no relationship between *Systematic risk (beta)* factor and WACC.

H3_a: $b_3 \neq 0$ There is a relationship between *Systematic risk (beta)* factor and WACC.

According to table 5.4, the value of Significance (2-tailed) is 0.000 and that is less than 0.05. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It implies that there is a relationship between Systematic risk (beta) factor and WACC with 95 % confidence or it is statistically significant at 5 % level.

Current Ratio

H4₀: $b_4 = 0$ There is no relationship between *Current Ratio* factor and WACC.

H4_a: $b_4 \neq 0$ There is a relationship between *Current Ratio* factor and WACC.

According to table 5.5, the value of Significance (2-tailed) is 0.524 and that is greater than 0.05. Therefore, it is failed to reject the null hypothesis. It implies that there is no relationship between Current Ratio factor and WACC with 95 % confidence or it is not statistically significant at 5 % level.

Debt to Equity Ratio

H5₀: $b_5 = 0$ There is no relationship between *Debt to Equity Ratio* factor and WACC.

H5_a: $b_5 \neq 0$ There is a relationship between *Debt to Equity Ratio* factor and WACC.

According to table 5.5, the value of Significance (2-tailed) is 0.230 and that is greater than 0.05. Therefore, it is failed to reject the null hypothesis. It implies that there is no relationship between Debt to Equity Ratio factor and WACC with 95 % confidence or it is not statistically significant at 5 % level.

Coverage Ratio

H6₀: $b_6 = 0$ There is no relationship between *Coverage Ratio* factor and WACC.

H6_a: $b_6 \neq 0$ There is a relationship between *Coverage Ratio* factor and WACC.

According to table 5.5, the value of Significance (2-tailed) is 0.300 and that is greater than 0.05. Therefore, it is failed to reject the null hypothesis. It implies that there is no relationship between Coverage Ratio factor and WACC with 95 % confidence or it is not statistically significant at 5 % level.

Capital Size

H7_o: $b_7 = 0$ There is no relationship between *Capital Size* factor and WACC.

H7_a: $b_7 \neq 0$ There is a relationship between *Capital Size* factor and WACC.

According to table 5.4, the value of Significance (2-tailed) is 0.023 and that is less than 0.05. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It implies that there is a relationship between Capital Size factor and WACC with 95 % confidence or it is statistically significant at 5 % level.



CHAPTER 6

SUMMARY OF FINDINGS, CONCLUSION, AND RECCOMENDATION

6.1 Summary of Findings

The WACC regression model presented in table 5.4 aims to investigate the relationship between WACC and Independent variables, namely, Inflation Rate, GDP Growth, Systematic Beta, Current Ratio, Debt to Equity Ratio, Coverage Ratio and Capital Size using multiple regression model technique. In this study the researcher can develop WACC regression model as follow: -

$$WACC = 32.066 + 1.649(Inflation\ Rate) + 0.958(GDP\ Growth\ Rate) + 0.904(Systematic\ Risk) - 2.479(Capital\ Size) + 10.92$$

The computed F value in table 5.3 is higher than critical value and it is significant at 5 % level. Therefore, The Multiple regression as a whole is highly significant. In addition, according to the R^2 in table 5.2, WACC can be explained by Inflation rate, GDP, Systematic Risk, and Capital size with 40.5 %. However from the regression model, the researcher can find that there are errors for predicting the value of WACC. That is 10.92 %.

Table 6.1: Standardized Coefficient Beta

Independent Variables	Standardized Coefficient Beta
1. Inflation Rate	0.307
2. GDP Growth	0.421
3. Systematic Risk (Beta)	0.505
4. Current Ratio	0.060
5. Debt to Equity Ratio	- 0.111
6. Coverage Ratio	- 0.106
7. Capital Size	- 0.217

From the value of the Standardized Coefficient Beta table 5.4, the researcher can construct table 6.1 that is the Standardized Coefficient Beta of each independent variable, in order to study which independent variables have more effect on the WACC. There is no unit for this Beta. It means if an independent variable has a high beta, that independent will have a strong relationship with WACC than the one with a low beta. Beta for Inflation Rate = 0.307, GDP = 0.421, **Systematic risk = 0.505**, **Current Ratio = 0.060**, Debt to Equity Ratio = -0.111, Coverage Ratio = -0.106, and Capital Size = -0.217.

From the above results, it can be reasonably concluded that Systematic Risk is the most important variable affecting WACC followed by GDP Growth rate, Inflation Rate, Capital Size, and Debt to Equity Ratio, Coverage Ratio, and Current Ratio respectively.

Table 6.2: Test Hypothesis Results

Independent Variables	Test Hypothesis
1. Inflation Rate	Reject H_0
2. GDP Growth	Reject H_0
3. Systematic Risk (Beta)	Reject H_0
4. Current Ratio	Failed to reject H_0
5. Debt to Equity Ratio	Failed to reject H_0
6. Coverage Ratio	Failed to reject H_0
7. Capital Size	Reject H_0

From t-statistic testing in table 5.4 and Standardized Coefficient Beta in table 6.1, the researcher can summarize the results of testing hypothesis that are shown in table 6.2 and the researcher can find the direction (positive or negative) of that relationship as well. For Inflation Rate, GDP Growth, and Systematic Risk (Beta), and Capital Size the null hypotheses are rejected and the alternative hypotheses are accepted. It implies that WACC is positively related with Inflation Rate, GDP Growth, and Systematic Risk (Beta), and negatively related with Capital Size, the relationship is statistically significant at 5 % level.

For Current Ratio, Debt to Equity Ratio, and Coverage Ratio, the null hypothesis is failed to reject. It implies that WACC is positively related with Current Ratio, and negatively related with Debt to Equity Ratio, and Coverage Ratio, but the relationship is not statistically significant at 5 % level.

6.2 Conclusion

The general purpose of this research study as stated in Chapter 1, is to study the determinants of WACC for Thai Communication Corporations listed on The Stock Exchange of Thailand (SET). Specifically, the objectives of this research are as follows:

- To study the factors that affect WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET). These factors are divided into the external factors and the company – specific factors.
- To develop WACC regression models on the basis of accounting data by considering financial statement for Thai Communication Corporations listed on The Stock Exchange of Thailand (SET).

A corporate manager requires an estimate of his or her companies WACC to evaluate the cash flows associated with proposed capital investments. The manager should also understand how the WACC changes overtime. In connection with these issues, this study is designed to seek answers to the following question:

- What are the factors that influence WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET)?
- How significant are the relationships between the factors and WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET)?

Referring to table 5.4 the results of this study, show that the WACC regression model is $WACC = 32.066 + 1.649(\text{Inflation Rate}) + 0.958(\text{GDP Growth Rate}) + 0.904(\text{Systematic Risk}) - 2.479(\text{Capital Size}) + 10.92$. After analyzing the results, only four of the seven variables are statistically significant at 5 % level. They are

Inflation Rate, GDP Growth, Systematic Risk (Beta), Capital Size and they are also consistent with the theories of Weighted Average Cost of Capital. The first three variables are found to be positively related with WACC while The Capital Size is negatively related with WACC. The rest are Current Ratio, Debt to Equity Ratio, and Coverage Ratio. Even though these three variables failed to rejected the null hypothesis at statistically significant 5 % level, based on the previous studies these three variables still have an impact on the WACC and in this study, the researcher has found that the coefficient sign for Current Ratio is positively related with WACC while Debt to Equity Ratio, and Coverage Ratio are negatively related with WACC.

The researcher can conclude that Inflation Rate, GDP Growth Rate, Systematic Risk, and Capital Size are the factors that influence WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET) with statistically significant at 5 % level. However, based on the previous studies, Current Ratio, Debt to Equity Ratio, and Coverage Ratio still have an impact on the cost of capital but are not statistically significant in this study. The investors look on the overall required rate of return or WACC and hence they don't look at the credit risk or those accounting factors (current ratio, debt to equity ratio, and coverage ratio), they look on the market risk or market condition (systematic risk or beta) and general economic condition as indicated by inflation, and GDP.

In addition, referring to table 6.1, it can be reasonably concluded that Systematic Risk is the most important variable affecting WACC for Thai Communication Corporations followed by GDP Growth rate, Inflation Rate, Capital Size, and Debt to Equity Ratio, Coverage Ratio, and Current Ratio respectively.

6.3 Recommendation

The lessons that Thai enterprises encountered in the year 1997 with the economic crisis could remind many financial executives who had always enjoyed borrowing without any concern on the cost of capital, the paying back is very difficult. Therefore, the finding of this research would lead to optimal approach for Thai Communication Corporations to survive and compete with others in this Millennium. This section begins with the recommendation for the investors followed by one for the managers.

For the investors, who look on the overall required rate of return or WACC and not looking at the credit risk or those accounting factors (current ratio, debt to equity ratio, and coverage ratio), the recommendation is to study the market risk or market condition (systematic risk or beta) and general economic condition as indicated by inflation, and GDP. If the costs of capital or WACC increase, it will affect the value of the company by reducing the value of the company and will decrease the stock price of the company. Therefore, the investors have to take an interest in all variables that have an impact on the cost of capital of the company and to put more emphasize on the market condition and general economic condition (Inflation Rate, GDP Growth Rate, Systematic Risk or Beta and Capital Size).

Managers need to understand how cost of capital affects the valuation of the enterprise. The consequences of misunderstanding can be devastating. Correctly evaluating the cost of capital and thereby determining the value creation potential of investments in a business is imperative. A clear understanding of the cost of capital is one important factor that can help the enterprise to maximize shareholders' value, because the most important use of the cost of capital is in the capital budgeting process of the company. Managers need cost of capital as the acceptance criterion for

investment decisions. Therefore, managers have to take interest in all variables that have impact on the cost of capital of the company and to put more emphasize on the Inflation Rate, GDP Growth Rate, Systematic Risk or Beta, and Capital Size.

The evidence of this research was obtained in Thailand by employing data from the ISIMS (Integrated – SET Information Management System) CD ROM in the period of 1994-2001. The multiple regression model is used, the results of regression are not satisfactory, but still consistent with international studies. This is because only four of seven independent variables are statistically significant and consistent with the theories of Cost of Capital. They are Inflation Rate, GDP Growth, Systematic Risk (Beta), and Capital Size. The reason may be that the Current Ratio, Debt to Equity Ratio and Coverage Ratio are not statistically significant but these are practically significant to have an impact on WACC of Thai Communication Corporations listed on The Stock Exchange of Thailand (SET). Therefore, mail survey should be used with some financial executives or who are involved in this field and the same multiple regression technique should be used in others sectors that are listed on The Stock Exchange of Thailand (SET) in order to compare with the multiple regression model used in this research study.

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APPENDICES



APPENDIX A.1

(Advanced Info Service
Public Company Limited)



Company : ADVANCED INFO SERVICE PUBLIC COMPANY LIMITED (ADVANC)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	6,535.54	1,497.30	839.65	2,062.85	520.09	636.91	737.35	662.50
SHORT-TERM INVESTMENTS	8,822.62	10,854.72	2,810.13	2,456.01	4,256.94	1,160.00	4,020.13	3,656.95
TRADE ACCOUNTS AND NOTES RECEIVABLE	7,674.22	5,445.31	3,848.35	2,625.76	3,152.25	2,199.33	1,966.29	1,066.66
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	1.03	4.20	0.55	17.65	256.31	490.45	704.02	690.46
INVENTORIES	2,238.47	1,970.37	939.47	683.43	66.00			
OTHER CURRENT ASSETS	5,781.85	2,201.22	1,090.63	977.47	907.27	485.65	262.86	282.17
TOTAL CURRENT ASSETS	31,053.73	21,973.11	9,528.78	8,823.17	9,158.86	4,972.33	7,690.66	6,358.74
SHORT-TERM INVESTMENTS	13.96	14.32	41.33	0.51				
INVESTMENT AND LOANS TO RELATED PARTIES				122.12	62.37	63.87	64.87	80.87
PROPERTY, PLANT AND EQUIPMENT, NET	62,567.25	36,287.34	28,787.03	31,739.54	25,426.63	665.55	508.65	408.83
OTHER ASSETS	19,903.44	895.19	1,507.02	840.84	680.62	16,096.02	11,844.80	8,678.67
TOTAL ASSETS	113,538.39	59,169.96	39,864.16	41,526.17	35,328.48	21,797.75	20,108.98	15,527.09
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	5,456.76	2,049.96	1,950.00	881.66		51.32	1,130.75	1,461.44
TRADE ACCOUNTS AND NOTES PAYABLE	10,701.38	4,602.48	2,324.11	8,603.22	7,674.17	4,790.81	4,074.24	2,279.72
CURRENT PORTION OF LONG-TERM LIABILITIES	10,256.03	2,302.05	1,033.13	5,799.92	2,025.94	465.54	1,125.43	738.83
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	334.27	294.21	135.05	30.89	88.03	68.76	221.94	103.26
OTHER CURRENT LIABILITIES	6,128.85	8,797.17	5,529.45	1,863.38	2,729.99	921.38	862.04	377.19
TOTAL CURRENT LIABILITIES	32,877.29	18,045.88	10,971.74	17,179.07	12,518.12	6,297.80	7,414.41	4,960.43
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES				129.27				
LONG-TERM LIABILITIES	33,918.12	9,084.72	3,891.87	6,483.73	7,584.35	1,836.55	1,807.18	2,665.05
LOANS	4,515.98	250.00	2,391.87	4,483.73	6,584.35			
DEBT INSTRUMENTS	29,402.14	8,834.72	1,500.00	2,000.00	1,000.00			
OTHER LIABILITIES	5,721.48	3,914.58	3,475.17	2,958.95	3,270.29	2,839.71	2,280.83	1,495.08
TOTAL LIABILITIES	72,516.89	31,045.18	18,338.78	26,751.02	23,372.76	10,974.07	11,502.41	9,120.56
MINORITY INTEREST	260.81	159.42	158.96	398.37	289.36	276.40	218.57	193.87
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	2,935.00	2,700.00	2,700.00	2,340.00	2,340.00	2,340.00	2,340.00	2,340.00
PAID-IN CAPITAL	20,004.00	10,215.00	10,215.00	2,295.00	2,295.00	2,295.00	2,295.00	2,295.00
RETAINED EARNINGS	17,821.69	15,050.37	8,451.42	9,741.77	7,031.36	5,912.29	3,753.00	1,577.66
APPROPRIATED	500.00	500.00	500.00	500.00	500.00			
UNAPPROPRIATED	17,321.69	14,550.37	7,951.42	9,241.77	6,531.36			
SHAREHOLDERS' EQUITY	40,760.69	27,965.37	21,366.42	14,376.77	11,666.36	10,547.29	8,388.00	6,212.66
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	113,538.39	59,169.96	39,864.16	41,526.17	35,328.48	21,797.75	20,108.98	15,527.09

Company : ADVANCED INFO SERVICE PUBLIC COMPANY LIMITED (ADVANC)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	59,257.24	36,958.65	25,213.65	14,944.40	15,166.03	12,720.89	9,955.06	6,197.36
EQUITY INCOME				6.20				
OTHER INCOME	1,480.79	2,771.00	659.04	2,333.03	409.05	594.51	595.90	281.00
TOTAL REVENUES	60,738.03	39,729.64	25,872.69	17,283.63	15,575.08	13,315.40	10,550.96	6,478.36
COST OF SALES	35,242.74	22,412.54	15,930.83	8,205.57	6,183.48	4,873.39	3,591.93	2,569.09
SELLING AND ADMINISTRATIVE EXPENSES	9,588.69	5,703.52	4,344.82	3,144.43	3,097.12	2,826.18	2,201.33	1,337.60
DIRECTORS' REMUNERATION	2.78	1.66	5.06	0.72	2.48			
INTEREST EXPENSES	1,572.90	729.44	718.29	1,216.86	572.17	253.08	314.95	239.40
OTHER EXPENSES	4,264.62		108.65	56.28	76.19	77.06	52.60	48.49
INCOME (LOSS) FROM OPERATION	10,066.30	10,882.49	4,765.03	4,659.77	5,643.65	5,285.70	4,390.16	2,283.79
INCOME TAX EXPENSES	6,238.44	4,283.08	1,995.71	1,584.98	1,797.83	1,664.59	1,371.12	711.29
INCOME (LOSS) AFTER INCOME TAX	3,827.86	6,599.40	2,769.32	3,074.79	3,845.82	3,621.11	3,019.04	1,572.50
EXTRAORDINARY ITEMS					(1,239.79)			
MINORITY INTEREST	(23.46)	0.46	19.26	109.02	82.96	57.83	24.70	27.60
NET INCOME (LOSS)	3,851.32	6,598.95	2,750.06	2,965.77	2,523.08	3,563.28	2,994.34	1,544.90
EARNINGS PER SHARE (BAHT)	1.39	24.44	10.37	12.67	10.78	15.23	12.80	15.82

EBIT	11,639.20	11,611.93	5,483.32	5,876.63	6,215.82	5,538.78	4,705.11	2,523.19
Coverage Ratio	7.40	15.92	7.63	4.83	10.86	21.89	14.94	10.54
Current Ratio	0.94	1.22	0.87	0.51	0.73	0.79	1.04	1.28
IBD (Interest Bearing Debt)	49,965.18	13,730.94	7,010.05	13,325.47	9,698.32	2,422.17	4,285.30	4,968.58
D-E Ratio	1.23	0.49	0.33	0.93	0.83	0.23	0.51	0.80
Capital Size	11.64	10.99	10.59	10.63	10.47	9.99	9.91	9.65
MVE	119,601.25	972,000.00	1,215,000.00	496,080.00	542,880.00	510,120.00	1,043,640.00	814,320.00
Closing Price (at the end of the year)	40.75	360.00	450.00	212.00	232.00	218.00	446.00	348.00

AIS Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	0.0613	0.94	1.23	7.40	11.64	4.2459
2000	1.6	4.6	1.6428	1.22	0.49	15.92	10.99	13.5973
1999	0.3	4.4	0.6627	0.87	0.33	7.63	10.59	11.1180
1998	8.1	-10.5	1.5890	0.51	0.93	4.83	10.63	18.0156
1997	5.6	-1.4	1.6303	0.73	0.83	10.86	10.47	20.0992
1996	5.9	5.9	2.1182	0.79	0.23	21.89	9.99	24.1260
1995	5.8	9.2	0.6044	1.04	0.51	14.94	9.91	17.5942
1994	5.0	9.0	0.0073	1.28	0.80	10.54	9.65	18.7533

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	119,601.25	49,965.18	1,572.90	0.0315	0.2947	0.7053	0.0510
5.75	972,000.00	13,730.94	729.44	0.0229	0.0139	0.9861	0.1377
7.92	1,215,000.00	7,010.05	718.29	0.0693	0.0057	0.9943	0.1115
10.52	496,080.00	13,325.47	1,216.86	0.1197	0.0262	0.9738	0.1827
12.44	542,880.00	9,698.32	572.17	0.0497	0.0176	0.9824	0.2040
13.89	510,120.00	2,422.17	253.08	0.0418	0.0047	0.9953	0.2423
14.69	1,043,640.00	4,285.30	314.95	0.0939	0.0041	0.9959	0.1764
18.81	814,320.00	4,968.58	239.40	0.0517	0.0061	0.9939	0.1885

APPENDIX A.2

(The International
Engineering Public
Company Limited)



Company : THE INTERNATIONAL ENGINEERING PUBLIC COMPANY LIMITED (IEC)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	43.65	93.24	365.68	616.37	538.62	41.15	103.23	55.74
SHORT-TERM INVESTMENTS	154.43	207.46	86.56	8.51	2.68	1,384.78	1,533.42	870.59
TRADE ACCOUNTS AND NOTES RECEIVABLE	181.44	143.98	82.41	161.04	371.62	496.11	569.36	502.92
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	22.45							
INVENTORIES	222.96	174.64	177.44	136.51	224.42	467.76	479.53	409.92
OTHER CURRENT ASSETS	116.09	94.35	101.39	88.67	1,514.02	89.10	100.32	133.24
TOTAL CURRENT ASSETS	741.01	713.65	813.48	1,011.10	2,651.36	2,478.91	2,785.85	1,972.40
INVESTMENT AND LOANS	70.60	100.93	127.76	910.84	124.08	81.03		
INVESTMENT AND LOANS TO RELATED PARTIES		22.41	43.68	52.06	69.70	1,709.16	830.06	60.62
PROPERTY, PLANT AND EQUIPMENT, NET	1,437.25	1,519.18	1,650.27	1,796.73	499.82	550.08	546.91	816.14
LONG-TERM PROJECT DEVELOPMENT UNDER CONSTRUCTION						1,199.67	1,214.25	
OTHER ASSETS	15.47	3.09	9.14	34.29	1,483.65	1,620.37	139.93	206.87
TOTAL ASSETS	2,264.33	2,359.28	2,644.33	3,805.03	4,828.61	7,639.21	5,517.00	3,056.03
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND LOANS FROM FINANCIAL INSTITUTIONS	61.98	398.17	1,521.35	1,958.59	486.67	1,040.59	494.75	721.20
TRADE ACCOUNTS AND NOTES PAYABLE	40.58	82.61	42.48	485.06	402.28	1,433.41	917.02	272.60
CURRENT PORTION OF LONG-TERM LIABILITIES	78.36	243.23	427.83		1,889.88			
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES				0.01	72.28			0.54
OTHER CURRENT LIABILITIES	56.00	159.35	234.17	97.77	204.46	471.99	257.89	450.15
TOTAL CURRENT LIABILITIES	236.92	883.37	2,225.82	2,541.42	3,055.58	2,945.98	1,669.66	1,444.48
TOTAL DEBENTURES						1,060.46	1,085.30	
CONVERTIBLE DEBENTURES						1,060.46	1,085.30	
LONG-TERM LIABILITIES	123.69	71.05		427.83	1,054.32	1,025.20	1,009.60	
LOANS	53.69	71.05						
DEBT INSTRUMENTS	61.77			427.83	1,054.32			
OTHERS	8.23							
OTHER LIABILITIES	28.50	5.97	5.84	214.73	217.37	148.56	52.58	
TOTAL LIABILITIES	389.11	960.38	2,231.66	3,183.98	4,327.27	5,180.19	3,817.13	1,444.48
MINORITY INTEREST	10.67			1.35	0.41	8.11	30.31	
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	718.61	437.61	437.61	437.61	437.61	437.61	405.97	398.40
PAID-IN CAPITAL	1,100.33	1,100.33	1,100.33	1,100.33	1,100.33	1,100.33	627.13	520.00
RETAINED EARNINGS	41.95	(139.04)	(1,136.60)	(918.24)	(1,037.02)	912.97	636.45	693.15
APPROPRIATED	53.00	53.00	53.00	53.00	53.00			
UNAPPROPRIATED	(11.05)	(192.04)	(1,189.60)	(971.24)	(1,090.02)			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT	3.66		11.32					
SHAREHOLDERS' EQUITY	1,864.55	1,398.90	412.67	619.71	500.93	2,450.91	1,669.55	1,611.55
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	2,264.33	2,359.28	2,644.33	3,805.03	4,828.61	7,639.21	5,517.00	3,056.03

Company : THE INTERNATIONAL ENGINEERING PUBLIC COMPANY LIMITED (IEC)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	2,102.85	1,580.33	955.98	1,241.32	2,199.42	2,922.61	3,002.15	2,729.58
EQUITY INCOME	(7.45)	(32.27)	(8.37)	63.00	(434.78)			
OTHER INCOME	82.17	50.86	997.51	1,116.54	409.13	244.85	153.77	87.44
TOTAL REVENUES	2,177.57	1,598.91	1,945.11	2,420.86	2,173.78	3,167.46	3,155.92	2,817.02
COST OF SALES	1,675.70	1,136.27	585.48	900.04	1,679.68	2,009.10	2,272.35	1,814.10
SELLING AND ADMINISTRATIVE EXPENSES	531.70	440.21	533.30	458.60	897.67	637.26	583.50	466.16
DIRECTORS' REMUNERATION	4.26	2.96	1.17	0.43				
INTEREST EXPENSES	30.40	108.14	203.32	209.77	249.37	269.04	121.04	27.63
OTHER EXPENSES	11.88	82.20	841.55	739.92		(327.60)	(76.80)	
INCOME (LOSS) BEFORE INCOME TAX AND EXTRAORDINARY ITEMS	(76.36)	(170.86)	(219.71)	112.10	(652.94)	579.66	255.83	509.13
INCOME TAX EXPENSES						182.29	81.49	158.96
INCOME (LOSS) BEFORE EXTRAORDINARY ITEMS	(76.36)	(170.86)	(219.71)	112.10	(652.94)	397.37	174.33	350.17
EXTRAORDINARY ITEMS	255.44	1,168.41			(1,173.46)			
MINORITY INTEREST	(1.92)		(1.35)	(6.68)	(7.70)	(0.94)	(8.01)	
NET INCOME (LOSS)	180.99	997.55	(218.36)	118.78	(1,818.70)	398.31	182.35	350.17
EARNINGS PER SHARE (BAHT)	2.97	22.80	(4.99)	2.71	(41.56)	9.56	4.57	14.29

EBIT	-45.96	-62.72	-16.39	321.87	-403.57	848.70	376.87	536.76
Coverage Ratio	-1.51	-0.58	-0.08	1.53	-1.62	3.15	3.11	19.43
Current Ratio	3.13	0.81	0.37	0.40	0.87	0.84	1.67	1.37
IBD (Interest Bearing Debt)	255.80	712.45	1,949.18	2,386.43	3,503.15	2,101.05	1,580.05	721.74
D-E Ratio	0.14	0.51	4.72	3.85	6.99	0.86	0.95	0.45
Capital Size	7.73	7.77	7.88	8.24	8.48	8.94	8.62	8.02
MVE	578.48	249.44	645.47	218.81	161.92	2,581.90	5,480.60	8,446.08
Closing Price (at the end of the year)	8.05	5.70	14.75	5.00	3.70	59.00	135.00	212.00

IEC Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	7.6541	3.13	0.14	-1.51	7.73	31.7785
2000	1.6	4.6	22.0666	0.81	0.51	-0.58	7.77	40.9974
1999	0.3	4.4	8.9030	0.37	4.72	-0.08	7.88	20.8125
1998	8.1	-10.5	40.3208	0.40	3.85	1.53	8.24	23.6139
1997	5.6	-1.4	5.6544	0.87	6.99	-1.62	8.48	7.4344
1996	5.9	5.9	5.4402	0.84	0.86	3.15	8.94	25.3106
1995	5.8	9.2	0.8148	1.67	0.95	3.11	8.62	15.5191
1994	5.0	9.0	-0.1231	1.37	0.45	19.43	8.02	16.9079

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	578.48	255.80	30.40	0.1188	0.3066	0.6934	0.4215
5.75	249.44	712.45	108.14	0.2234	0.7407	0.2593	1.1343
7.92	645.47	1,949.18	203.32	0.1528	0.7512	0.2488	0.5137
10.52	218.81	2,386.43	209.77	0.0968	0.9160	0.0840	2.0729
12.44	161.92	3,503.15	249.37	0.0847	0.9558	0.0442	0.4003
13.89	2,581.90	2,101.05	269.04	0.0960	0.4487	0.5513	0.4044
14.69	5,480.60	1,580.05	121.04	0.0658	0.2238	0.7762	0.1867
18.81	8,446.08	721.74	27.63	0.0240	0.0787	0.9213	0.1821

APPENDIX A.3

(Jasmine International Public Company Limited)



Company : JASMIN INTERNATIONAL PUBLIC COMPANY LIMITED (JASMIN)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	1,928.90	1,534.17	3,093.80	797.88	415.17	530.18	316.58	400.19
SHORT-TERM INVESTMENTS	110.12	371.15	210.25	78.42	0.30	1,346.14	2,079.78	1,604.00
TRADE ACCOUNTS AND NOTES RECEIVABLE	883.04	3,714.71	5,342.96	4,707.86	4,551.66	2,264.33	1,040.52	923.90
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	10.73	409.98	419.48	1,044.22	669.51	2,914.65	990.41	477.21
INVENTORIES	241.52	316.79	578.29	1,009.37	503.57	648.07	282.93	124.33
OTHER CURRENT ASSETS	486.52	384.61	472.59	644.47	763.36	1,012.52	1,211.87	170.75
TOTAL CURRENT ASSETS	3,660.83	6,731.40	10,117.37	8,282.23	6,903.55	8,715.89	5,922.09	3,700.37
INVESTMENT AND LOANS	801.52	744.62	604.04	661.58	653.59			
INVESTMENT AND LOANS TO RELATED PARTIES	5,347.47	2,493.16	4,727.97	6,333.61	5,648.02	6,621.70	4,769.00	2,605.12
PROPERTY, PLANT AND EQUIPMENT, NET	7,277.22	8,159.38	3,758.01	9,519.66	3,882.66	1,535.02	1,245.93	586.29
LONG-TERM PROJECT DEVELOPMENT UNDER CONSTRUCTION						5,235.75		
OTHER ASSETS	1,023.49	1,684.40	5,812.18	1,116.38	6,492.20	539.84	4,996.29	5,361.86
TOTAL ASSETS	18,110.52	19,812.96	25,019.57	25,913.45	23,580.02	22,648.19	16,933.31	12,253.65
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	125.72	225.71	3,194.57	5,031.47	4,355.50	3,675.66	3,172.57	2,294.20
TRADE ACCOUNTS AND NOTES PAYABLE	469.28	1,058.99	1,681.39	1,806.36	1,175.25	996.70	475.26	405.56
CURRENT PORTION OF LONG-TERM LIABILITIES	4,390.24	2,488.04	3,383.98	3,392.60	411.74	420.19	413.64	302.54
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	82.98	19.68	30.02	438.08	3.31			
OTHER CURRENT LIABILITIES	839.32	790.12	1,163.89	1,144.53	951.18	1,249.98	607.83	368.38
TOTAL CURRENT LIABILITIES	5,907.55	4,582.53	9,453.85	11,813.05	6,896.98	6,342.52	4,669.29	3,370.69
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES		56.28	299.96					
LONG-TERM LIABILITIES	11,076.38	14,721.51	10,743.75	8,223.17	12,710.82	6,441.90	2,325.81	2,608.72
LOANS	11,076.38	14,721.51						
DEBT INSTRUMENTS			2,906.88					
OTHERS			7,836.87					
OTHER LIABILITIES	24.86	22.13	1,245.90	404.28	262.76			
TOTAL LIABILITIES	17,008.78	19,382.45	21,743.46	20,440.50	19,870.56	12,784.42	6,995.10	5,979.41
MINORITY INTEREST	154.79	162.74	232.87	412.68	378.26	590.18	607.10	84.58
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	4,745.36	4,475.97	3,435.21	3,336.00	3,336.00	3,336.00	3,336.00	1,112.00
TREASURY STOCKS	(600.00)	(600.00)						
WARRANTS	25.74	28.43	32.37					
PAID-IN CAPITAL	3,838.77	4,303.14	4,423.12	4,471.74	4,139.37	4,471.74	4,471.74	4,139.37
RETAINED EARNINGS	(7,379.61)	(7,332.85)	(6,549.77)	(3,809.52)	(4,476.54)	1,469.72	1,523.38	938.29
APPROPRIATED	318.36	310.85	276.46	271.80	231.50			
UNAPPROPRIATED	(7,697.96)	(7,643.70)	(6,826.23)	(4,081.32)	(4,708.04)			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT	(12.49)	(604.62)	1,696.48					
UNREALIZED GAIN (LOSS) ON FOREIGN CURRENCY TRANSLATION	(3.20)	(2.31)	5.83	1,062.06		(3.87)		
OTHER CAPITAL SURPLUSES	332.37				332.37			
SHAREHOLDERS' EQUITY	946.95	267.77	3,043.24	5,060.28	3,331.20	9,273.59	9,331.11	6,189.65
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	18,110.52	19,812.96	25,019.57	25,913.45	23,580.02	22,648.19	16,933.31	12,253.65

INCOME STATEMENT 1994-2001
Company : JASMINE INTERNATIONAL PUBLIC COMPANY LIMITED (JASMIN)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	4,176.78	4,469.43	6,716.29	5,532.74	5,518.12	6,942.51	4,199.60	2,841.91
EQUITY INCOME	(92.31)	(15.29)	(868.43)	(573.54)	(1,336.91)			
OTHER INCOME	1,007.37	400.12	327.66	1,330.50	624.18	373.29	1,281.49	538.63
TOTAL REVENUES	5,091.83	4,854.26	6,175.52	6,289.70	4,805.39	7,315.79	5,481.08	3,380.54
COST OF SALES	2,229.66	2,400.56	4,108.17	3,246.08	3,451.62	4,205.91	2,395.71	1,436.27
SELLING AND ADMINISTRATIVE EXPENSES	672.96	638.44	931.50	745.03	1,290.33	892.22	642.21	370.66
DIRECTORS' REMUNERATION	7.51	6.54	7.84	8.89				
INTEREST EXPENSES	1,358.40	1,431.46	1,330.42	1,588.08	1,323.62	772.85	448.25	562.83
OTHER EXPENSES		1,007.71	2,452.65					40.17
INCOME (LOSS) FROM OPERATION	823.30	(630.45)	(2,655.06)	701.63	(1,260.19)	1,444.81	1,994.91	970.61
INCOME TAX EXPENSES	146.47	169.64	119.77	149.90	255.72	501.92	579.12	313.65
INCOME (LOSS) AFTER INCOME TAX	676.83	(800.09)	(2,774.82)	551.73	(1,515.90)	942.89	1,415.79	656.96
EXTRAORDINARY ITEMS			30.61		(4,140.09)			
MINORITY INTEREST	0.06	(17.01)	(166.68)	27.12	(210.13)	(4.26)	46.74	55.61
NET INCOME (LOSS)	676.77	(783.08)	(2,577.53)	524.61	(5,445.86)	947.15	1,369.05	601.36
EARNINGS PER SHARE (BAHT)	1.71	(2.08)	(7.71)	1.57	(16.32)	2.84	4.92	5.95

EBIT	2,181.70	801.01	-1,324.64	2,289.71	63.43	2,217.66	2,443.16	1,533.44
Coverage Ratio	1.61	0.56	-1.00	1.44	0.05	2.87	5.45	2.72
Current Ratio	0.62	1.47	1.07	0.70	1.00	1.37	1.27	1.10
IBD (Interest Bearing Debt)	15,675.32	17,511.22	9,815.41	8,862.15	4,770.55	4,095.85	3,586.21	2,596.74
D-E Ratio	16.55	65.40	3.23	1.75	1.43	0.44	0.38	0.42
Capital Size	9.80	9.89	10.13	10.16	10.07	10.03	9.74	9.41
MVE	1,660.88	3,670.30	8,931.55	3,035.76	3,069.12	13,093.80	43,034.40	50,040.00
Closing Price (at the end of the year)	3.50	8.20	26.00	9.10	9.20	39.25	129.00	450.00

Jasmin Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	3.8052	0.62	16.55	1.61	9.80	7.7238
2000	1.6	4.6	8.2630	1.47	65.40	0.56	9.89	12.9759
1999	0.3	4.4	5.6004	1.07	3.23	-1.00	10.13	20.3627
1998	8.1	-10.5	11.6491	0.70	1.75	1.44	10.16	26.0553
1997	5.6	-1.4	13.3339	1.00	1.43	0.05	10.07	38.6153
1996	5.9	5.9	6.7012	1.37	0.44	2.87	10.03	38.3980
1995	5.8	9.2	-0.0151	1.27	0.38	5.45	9.74	14.1202
1994	5.0	9.0	0.9416	1.10	0.42	2.72	9.41	22.8791

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	1,660.88	15,675.32	1,358.40	0.0867	0.9042	0.0958	0.2337
5.75	3,670.30	17,511.22	1,431.46	0.0863	0.8267	0.1733	0.4607
7.92	8,931.55	9,815.41	1,330.42	0.0974	0.5236	0.4764	0.3525
10.52	3,035.76	8,862.15	1,588.08	0.1701	0.7448	0.2552	0.6737
12.44	3,069.12	4,770.55	1,323.62	0.1942	0.6085	0.3915	0.7751
13.89	13,093.80	4,095.85	772.85	0.1743	0.2383	0.7617	0.4659
14.69	43,034.40	3,586.21	448.25	0.1167	0.0769	0.9231	0.1462
18.81	50,040.00	2,596.74	562.83	0.1821	0.0493	0.9507	0.2341

APPENDIX A.4

(Samart Corporation Public Company Limited)



Company : SAMART CORPORATION PUBLIC COMPANY LIMITED (SAMART)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	278.49	136.72	552.45	590.32	446.18	488.38	248.95	165.63
SHORT-TERM INVESTMENTS	0.55	1,214.71	147.72	397.59	169.80	300.35	481.75	393.44
TRADE ACCOUNTS AND NOTES RECEIVABLE	662.55	946.99	1,143.55	1,588.43	1,950.69	2,868.13	1,024.35	762.02
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	88.42	0.09	14.34	2.99	102.34	98.35	410.92	372.59
INVENTORIES	683.35	550.50	672.48	490.84	1,306.86	1,098.48	709.01	434.53
OTHER CURRENT ASSETS	444.84	425.51	340.76	469.21	1,594.22	387.00	273.79	114.00
TOTAL CURRENT ASSETS	2,158.20	3,274.51	2,871.30	3,539.39	5,570.08	5,240.69	3,148.77	2,242.20
INVESTMENT AND LOANS	125.64	1,295.25	82.09	14.25	358.61		15.43	15.44
INVESTMENT AND LOANS TO RELATED PARTIES	343.66	82.93	2,779.54	88.94	426.53	609.68	644.34	755.71
PROPERTY, PLANT AND EQUIPMENT, NET	4,589.84	5,560.71	6,196.62	14,880.08	7,909.65	1,490.62	631.76	290.71
LONG-TERM PROJECT DEVELOPMENT UNDER CONSTRUCTION						12.72		
OTHER ASSETS	543.78	1,022.71	525.39	2,307.25	1,501.78	4,366.94	2,686.64	1,015.94
TOTAL ASSETS	7,761.12	11,236.11	12,454.94	20,829.89	15,766.65	11,720.65	7,126.95	4,319.99
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	444.40	653.60	497.80	6,893.72	4,198.32	3,306.08	1,649.81	1,285.12
TRADE ACCOUNTS AND NOTES PAYABLE	591.86	769.30	487.16	780.90	1,357.85	450.20	255.40	109.67
CURRENT PORTION OF LONG-TERM LIABILITIES	619.74	1,105.20	276.11	1,354.59	697.11	951.45	748.93	96.36
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	2.91	0.05	815.99	22.04	76.43	668.70	342.38	812.19
OTHER CURRENT LIABILITIES	902.14	1,060.23	1,333.77	1,086.76	869.32	566.38	326.94	110.22
TOTAL CURRENT LIABILITIES	2,561.05	3,588.39	3,410.82	10,138.01	7,199.04	5,942.82	3,323.47	2,413.56
TOTAL DEBENTURES								
DEBENTURES						1,000.87		
LONG-TERM LIABILITIES	4,134.08	8,574.23	9,010.40	5,677.44	4,930.42	326.81	1,227.79	477.85
LOANS	4,134.08	8,441.14	8,714.96	404.09				
DEBT INSTRUMENTS				1,535.28				
OTHERS		133.09	295.44	3,738.07				
OTHER LIABILITIES	85.38	165.63	198.27	257.73	496.21	142.91	25.78	4.26
TOTAL LIABILITIES	6,780.51	12,328.24	12,619.50	16,073.18	12,625.66	7,413.40	4,577.04	2,895.67
MINORITY INTEREST	1,093.05	797.88	750.75	3,225.24	2,542.85	813.02	190.59	11.89
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	939.09	753.15	741.08	741.08	741.08	695.81	695.81	450.00
WARRANTS			24.19					
ADVANCE FROM STOCK SUBSCRIPTION				1,091.95				
APPRAISAL SURPLUS	138.61	167.22	168.28	191.15	316.52	316.52		
PAID-IN CAPITAL	1,486.21	1,391.75	1,367.56	1,367.56	1,367.56	1,012.71	1,012.71	630.00
EXCESS OF INVESTMENT (OVER) LESS NET BOOK VALUE						527.87		
RETAINED EARNINGS	(3,220.72)	(3,442.15)	(5,271.05)	(3,920.06)	(3,257.15)	946.32	655.09	333.37
APPROPRIATED	69.83	69.83	69.83	69.83				
UNAPPROPRIATED	(3,290.55)	(3,511.97)	(5,340.88)	(3,989.88)	(3,326.97)			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT		(1,402.10)				(5.00)	(4.29)	(0.93)
UNREALIZED GAIN (LOSS) ON FOREIGN CURRENCY TRANSLATION							0.00	
OTHER CAPITAL SURPLUSES	544.37	642.10	2,054.64	2,059.81	1,430.13			
SHAREHOLDERS' EQUITY	(112.44)	(1,890.02)	(915.30)	1,531.48	598.14	3,494.23	2,359.32	1,412.44
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	7,761.12	11,236.11	12,454.94	20,829.89	15,766.65	11,720.65	7,126.95	4,319.99

Company : SAMART CORPORATION PUBLIC COMPANY LIMITED (SAMART)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	6,823.44	5,301.31	4,370.21	5,924.46	5,852.29	4,691.93	2,327.65	1,280.16
EQUITY INCOME	(10.67)	(119.19)	(232.75)	(100.08)	(41.53)			
OTHER INCOME	1,968.01	2,885.97	313.15	933.50	604.85	692.99	887.04	305.32
TOTAL REVENUES	8,780.78	8,068.09	4,450.61	6,757.88	6,415.62	5,384.92	3,214.70	1,585.48
COST OF SALES	5,427.27	3,803.57	2,904.94	4,179.57	4,180.76	3,097.96	1,649.57	826.23
SELLING AND ADMINISTRATIVE EXPENSES	1,688.07	1,209.28	1,205.75	1,769.31	2,411.00	1,109.54	665.83	252.06
DIRECTORS' REMUNERATION	3.14	1.61	5.08	1.13	4.68			
INTEREST EXPENSES	527.14	613.31	664.64	907.19	556.95	432.64	233.65	113.71
OTHER EXPENSES	1,006.05	436.38	659.63	425.05	0.71			
INCOME (LOSS) FROM OPERATION	129.11	2,003.95	(989.42)	(524.36)	(738.48)	744.78	665.64	393.48
INCOME TAX EXPENSES	50.23	131.47	39.97	81.92	110.17	252.76	195.19	106.53
INCOME (LOSS) AFTER INCOME TAX	78.88	1,872.48	(1,029.39)	(606.28)	(848.64)	492.02	470.45	286.95
EXTRAORDINARY ITEMS					(3,218.48)			
MINORITY INTEREST	(142.11)	44.64	5.07	56.63	(89.80)	(7.95)	(4.34)	3.22
NET INCOME (LOSS)	220.99	1,827.84	(1,034.46)	(662.91)	(3,977.33)	499.98	474.79	283.73
EARNINGS PER SHARE (BAHT)	2.89	24.27	(13.96)	(8.95)	(56.66)	7.19	7.10	6.31

EBIT	656.25	2,617.26	-324.78	382.83	-181.53	1,177.42	899.29	507.19
Coverage Ratio	1.24	4.27	-0.49	0.42	-0.33	2.72	3.85	4.46
Current Ratio	0.84	0.91	0.84	0.35	0.77	0.88	0.95	0.93
IBD (Interest Bearing Debt)	5,201.13	10,199.99	10,304.86	10,209.72	4,971.86	5,927.10	2,741.12	2,193.67
D-E Ratio	-46.26	-5.40	-11.26	6.67	8.31	1.70	1.16	1.55
Capital Size	8.96	9.33	9.43	9.94	9.67	9.37	8.87	8.37
MVE	896.83	1,092.07	3,186.64	370.54	1,852.70	9,045.53	11,480.87	12,690.00
Closing Price (at the end of the year)	9.55	14.50	43.00	5.00	25.00	130.00	165.00	282.00

Samart Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	4.0021	0.84	-46.26	1.24	8.96	9.6295
2000	1.6	4.6	5.8090	0.91	-5.40	4.27	9.33	8.3336
1999	0.3	4.4	2.9925	0.84	-11.26	-0.49	9.43	8.7860
1998	8.1	-10.5	12.4743	0.35	6.67	0.42	9.94	8.4746
1997	5.6	-1.4	3.8511	0.77	8.31	-0.33	9.67	12.2208
1996	5.9	5.9	7.8196	0.88	1.70	2.72	9.37	33.6451
1995	5.8	9.2	3.6674	0.95	1.16	3.85	8.87	27.0335
1994	5.0	9.0	0.8414	0.93	1.55	4.46	8.37	20.0139

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	896.83	5,201.13	527.14	0.1014	0.8529	0.1471	0.2433
5.75	1,092.07	10,199.99	613.31	0.0796	0.9033	0.0967	0.3410
7.92	3,186.64	10,304.86	664.64	0.0648	0.7638	0.2362	0.2252
10.52	370.54	10,209.72	907.19	0.0884	0.9650	0.0350	0.7139
12.44	1,852.70	4,971.86	556.95	0.0734	0.7285	0.2715	0.3123
13.89	9,045.53	5,927.10	432.64	0.0794	0.3959	0.6041	0.5205
14.69	11,480.87	2,741.12	233.65	0.0539	0.1927	0.8073	0.3259
18.81	12,690.00	2,193.67	113.71	0.0461	0.1474	0.8526	0.2292

APPENDIX A.5

(Samarit Telecoms Public
Company Limited)



Company : SAMART TELCOMS PUBLIC COMPANY LIMITED (SAMTEL)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	31.09	83.58	161.11	221.99	39.43	17.36	5.74	24.53
SHORT-TERM INVESTMENTS						281.35	29.82	
TRADE ACCOUNTS AND NOTES RECEIVABLE	217.82	178.71	278.61	329.15	341.29	149.40	63.59	47.70
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	0.03	0.16	0.62	1.31	1.30	8.81	6.61	1.73
INVENTORIES	18.87	19.82	33.45	25.10	25.67	51.34	2.64	4.43
OTHER CURRENT ASSETS	37.09	28.23	51.72	47.00	216.17	77.31	36.82	31.99
TOTAL CURRENT ASSETS	304.89	310.50	525.50	624.55	623.87	585.57	145.22	110.38
INVESTMENT AND LOANS	10.24							
INVESTMENT AND LOANS TO RELATED PARTIES	1.00							
PROPERTY, PLANT AND EQUIPMENT, NET	2,447.48	3,047.32	3,417.27	3,842.42	250.19	321.74	127.00	664.66
OTHER ASSETS	47.65	40.60	5.58	87.32	3,394.13	1,059.97	621.06	4.22
TOTAL ASSETS	2,811.26	3,398.42	3,948.35	4,554.29	4,268.18	1,967.28	893.28	779.25
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	197.74	174.87	260.36	813.43	636.12	68.61	312.87	59.33
TRADE ACCOUNTS AND NOTES PAYABLE	352.65	420.12	1,071.14	1,187.18	1,478.54	77.86	28.98	14.22
CURRENT PORTION OF LONG-TERM LIABILITIES	98.39	84.00	84.00				36.00	71.77
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	6.46	2.80	376.06	471.59	396.86	42.55	6.84	207.36
OTHER CURRENT LIABILITIES	102.71	94.16	127.96	146.97	115.85	103.29	62.66	58.64
TOTAL CURRENT LIABILITIES	757.94	775.95	1,919.51	2,619.18	2,627.37	292.32	447.35	411.32
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	368.22	713.59						
LONG-TERM LIABILITIES	188.89	296.64	493.11	262.44			33.34	88.18
LOANS	188.89	231.03	315.03					
OTHERS		65.61	178.08					
OTHER LIABILITIES	110.97	3.49	4.60	4.64	6.26	7.35	7.13	5.56
TOTAL LIABILITIES	1,426.02	1,789.67	2,417.21	2,886.26	2,633.64	299.67	487.82	505.07
MINORITY INTEREST	0.30	0.45	0.00		0.00	0.00	0.00	
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	520.00	520.00	520.00	520.00	520.00	520.00	400.00	350.00
APPRAISAL SURPLUS	1.54	1.54	1.54	8.59	8.59	8.59		
PAID-IN CAPITAL	1,032.00	1,032.00	1,032.00	1,032.00	1,032.00	1,032.00		
EXCESS OF INVESTMENT (OVER) LESS NET BOOK VALUE					1.41			
RETAINED EARNINGS	(168.59)	54.76	(22.41)	107.44	72.55	107.03	5.46	(75.82)
APPROPRIATED	7.71	7.71	7.71	7.71	5.97			
UNAPPROPRIATED	(176.30)	47.05	(30.12)	99.72	66.58			
SHAREHOLDERS' EQUITY	1,384.95	1,608.30	1,531.13	1,668.03	1,634.54	1,667.62	405.46	274.18
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	2,811.26	3,398.42	3,948.35	4,554.29	4,268.18	1,967.28	893.28	779.25

INCOME STATEMENT 1994-2001
Company : SAMART TELCOMS PUBLIC COMPANY LIMITED (SAMTEL)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	1,229.57	1,217.11	1,355.32	1,330.51	836.41	488.26	363.75	344.52
OTHER INCOME	31.04	50.78	20.53	83.44	26.92	70.33	10.73	13.98
TOTAL REVENUES	1,260.60	1,267.89	1,375.85	1,413.95	863.33	558.59	374.48	358.50
COST OF SALES	902.76	828.05	948.23	838.63	504.42	286.15	173.82	189.82
SELLING AND ADMINISTRATIVE EXPENSES	140.66	113.11	140.15	144.72	170.08	111.37	66.22	48.43
DIRECTORS' REMUNERATION	1.08		6.00	1.99	1.10			
INTEREST EXPENSES	159.21	208.73	318.44	361.37	80.24	28.95	45.73	50.05
OTHER EXPENSES	251.36		2.51					
INCOME (LOSS) FROM OPERATION	(194.46)	118.00	(39.48)	67.23	107.48	132.12	88.71	70.21
INCOME TAX EXPENSES	29.04	40.88	3.69	32.34	66.65	30.56	7.43	
INCOME (LOSS) AFTER INCOME TAX	(223.50)	77.13	(43.17)	34.89	40.83	101.57	81.28	70.21
EXTRAORDINARY ITEMS					(28.50)			
MINORITY INTEREST	(0.15)	(0.05)			0.00		0.00	
NET INCOME (LOSS)	(223.35)	77.17	(43.17)	34.89	12.32	101.57	81.28	70.21
EARNINGS PER SHARE (BAHT)	(4.30)	1.48	(0.83)	0.67	0.24	2.26	2.19	2.15

EBIT	-35.25	326.73	278.96	428.60	187.72	161.07	134.44	120.26
Coverage Ratio	-0.22	1.57	0.88	1.19	2.34	5.56	2.94	2.40
Current Ratio	2.97	3.30	4.11	4.25	5.39	5.67	2.32	1.88
IBD (Interest Bearing Debt)	859.70	1,206.29	1,035.45	1,285.02	1,032.98	111.16	355.71	338.46
D-E Ratio	0.62	0.75	0.68	0.77	0.63	0.07	0.88	1.23
Capital Size	7.94	8.13	8.28	8.42	8.36	7.58	6.79	6.66
MVE	486.20	754.00	1,534.00	585.00	1,352.00	3,640.00	3,393.60	3,430.00
Closing Price (at the end of the year)	9.35	14.50	29.50	11.25	26.00	70.00	84.84	98.00

Samtel Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	4.6193	2.97	0.62	-0.22	7.94	18.1576
2000	1.6	4.6	9.1869	3.30	0.75	1.57	8.13	28.1598
1999	0.3	4.4	4.6156	4.11	0.68	0.88	8.28	26.1897
1998	8.1	-10.5	18.0973	4.25	0.77	1.19	8.42	45.9005
1997	5.6	-1.4	6.8850	5.39	0.63	2.34	8.36	28.1976
1996	5.9	5.9	12.2600	5.67	0.07	5.56	7.58	71.6394
1995	5.8	9.2	9.2774	2.32	0.88	2.94	6.79	55.5755
1994	5.0	9.0	9.2774	1.88	1.23	2.40	6.66	59.2345

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	486.20	859.70	159.21	0.1852	0.6388	0.3612	0.2734
5.75	754.00	1,206.29	208.73	0.2021	0.6154	0.3846	0.5058
7.92	1,534.00	1,035.45	318.44	0.2841	0.4030	0.5970	0.3044
10.52	585.00	1,285.02	361.37	0.3115	0.6872	0.3128	0.9883
12.44	1,352.00	1,032.98	80.24	0.0692	0.4331	0.5669	0.4604
13.89	3,640.00	111.16	28.95	0.0506	0.0296	0.9704	0.7372
14.69	3,393.60	355.71	45.73	0.1959	0.0949	0.9051	0.5996
18.81	3,430.00	338.46	50.05	0.1442	0.0898	0.9102	0.6408

APPENDIX A.6

(Shinawatra Satellite
Company Limited)



BALANCE SHEET 1994-2001

Company : SHINAWATRA SATELLITE PUBLIC COMPANY LIMITED (SATEL)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	799.42	643.41	328.86	404.42	168.93	241.26	78.01	178.55
SHORT-TERM INVESTMENTS	19.66	85.75	38.43	217.69	1.40	1,626.82	3,467.05	180.00
TRADE ACCOUNTS AND NOTES RECEIVABLE	663.18	568.06	574.08	321.30	398.98	603.07	535.81	90.48
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES			0.04	2.54	1.28	0.14	4.00	3.19
INVENTORIES	39.79	26.54	20.88		0.18			
OTHER CURRENT ASSETS	349.62	426.84	363.65	186.06	230.80	211.62	157.92	84.76
TOTAL CURRENT ASSETS	1,871.66	1,750.60	1,325.97	1,132.01	801.57	2,682.90	4,242.79	536.99
INVESTMENT AND LOANS	29.32	29.32	7,503.97	30.02	3,029.44	1,647.10		
INVESTMENT AND LOANS TO RELATED PARTIES	477.24	237.98	89.36				662.93	
PROPERTY, PLANT AND EQUIPMENT, NET	11,880.63	9,657.88	1,251.25	8,901.10	9,471.47	1,889.62	382.27	79.47
OTHER ASSETS	117.72	155.85	973.84	1,054.26	210.98	7,790.13	6,141.59	5,974.19
TOTAL ASSETS	14,376.57	11,831.62	11,144.39	11,117.40	13,513.45	14,009.76	11,429.58	6,590.65
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	2,509.97	1,157.59	274.53	514.90	510.22	407.67	857.84	102.36
TRADE ACCOUNTS AND NOTES PAYABLE	941.05	743.94	130.22	437.40	255.07	239.95	201.42	108.28
CURRENT PORTION OF LONG-TERM LIABILITIES	2,081.97	2,101.43	1,198.22	2,316.84	3,719.88	663.62	313.76	312.52
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	178.51	184.47	179.12	0.01	350.08	1,362.64	195.84	431.26
OTHER CURRENT LIABILITIES	908.12	844.79	516.46	111.44	64.31	81.56	55.71	50.09
TOTAL CURRENT LIABILITIES	6,619.61	5,032.22	2,298.54	3,380.60	4,899.55	2,755.44	1,624.57	1,004.51
LONG-TERM LIABILITIES	1,687.21	2,180.31	4,474.89	5,311.13	8,027.28	4,970.71	3,396.02	2,674.48
LOANS	1,687.21	680.31	1,474.89	4,311.13	8,027.28			
DEBT INSTRUMENTS		1,500.00	3,000.00	1,000.00				
OTHER LIABILITIES	274.00	381.09	86.45			543.99	753.33	
TOTAL LIABILITIES	8,580.82	7,593.62	6,859.89	8,691.72	12,926.83	8,270.14	5,773.92	3,679.00
MINORITY INTEREST	18.91	23.86	28.85	16.63	12.61	583.07	530.32	3.19
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	4,375.00	4,375.00	4,375.00	3,500.00	3,500.00	3,500.00	3,500.00	1,750.00
PAID-IN CAPITAL	2,190.00	2,190.00	2,190.00	1,315.00	1,315.00	1,315.00	1,315.00	1,315.00
RETAINED EARNINGS	(808.50)	(2,371.65)	(2,312.28)	(2,405.95)	(4,240.98)	341.55	310.34	(156.53)
APPROPRIATED	27.58	27.58	27.58	27.58	27.58			
UNAPPROPRIATED	(836.08)	(2,399.22)	(2,339.86)	(2,433.53)	(4,268.56)			
UNREALIZED GAIN (LOSS) ON FOREIGN CURRENCY TRANSLATION	20.34	20.79	2.92					
SHAREHOLDERS' EQUITY	5,776.84	4,214.14	4,255.64	2,409.05	574.02	5,156.55	5,125.34	2,908.47
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	14,376.57	11,831.62	11,144.39	11,117.40	13,513.45	14,009.76	11,429.58	6,590.65

INCOME STATEMENT 1994-2001

Company : SHINAWATRA SATELLITE PUBLIC COMPANY LIMITED (SATTEL)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	4,817.48	4,016.50	2,980.80	2,415.59	1,895.62	1,758.67	1,153.13	281.27
EQUITY INCOME	324.85	181.60	36.65		191.78			
OTHER INCOME	19.08	35.80	66.30	1,901.34	532.19	338.98	634.05	98.11
TOTAL REVENUES	5,161.40	4,233.90	3,083.75	4,316.93	2,619.59	2,097.65	1,787.18	379.38
COST OF SALES	2,559.92	2,070.67	1,601.13	1,395.81	1,388.42	999.25	628.33	286.30
SELLING AND ADMINISTRATIVE EXPENSES	567.83	541.56	366.19	377.53	751.81	375.88	284.49	145.83
DIRECTORS' REMUNERATION	1.78	1.54	1.56	0.74	0.84			
INTEREST EXPENSES	358.56	491.20	623.68	703.80	528.56	325.29	240.43	105.50
OTHER EXPENSES	103.31	418.27	199.17		371.49			
INCOME (LOSS) FROM OPERATION	1,570.01	710.66	292.03	1,839.05	(421.52)	397.23	633.93	(158.25)
INCOME TAX EXPENSES	11.81	2.21				128.07	119.79	
INCOME (LOSS) AFTER INCOME TAX	1,558.20	708.46	292.03	1,839.05	(421.52)	269.15	514.15	(158.25)
EXTRAORDINARY ITEMS					(4,073.52)			
MINORITY INTEREST	(4.95)	(2.08)	12.23	4.02		27.95	47.27	(1.72)
NET INCOME (LOSS)	1,563.15	710.54	279.80	1,835.03	(4,495.03)	241.21	466.88	(156.53)
EARNINGS PER SHARE (BAHT)	3.57	1.62	0.75	5.24	(12.84)	0.69	1.44	(0.89)

EBIT	1,928.57	1,201.86	915.71	2,542.85	107.04	722.52	874.36	-52.75
Coverage Ratio	5.38	2.45	1.47	3.61	0.20	2.22	3.64	-0.50
Current Ratio	2.06	2.07	2.57	10.16	12.46	32.89	76.16	10.72
IBD (Interest Bearing Debt)	6,457.66	5,623.80	6,126.76	8,142.88	12,607.46	2,433.93	1,367.44	846.14
D-E Ratio	1.12	1.33	1.44	3.38	21.96	0.47	0.27	0.29
Capital Size	9.57	9.38	9.32	9.32	9.51	9.55	9.34	8.79
MVE	10,631.25	8,640.63	17,171.88	6,387.50	1,400.00	10,150.00	14,262.50	10,237.50
Closing Price (at the end of the year)	24.30	19.75	39.25	18.25	4.00	29.00	40.75	58.50

Sattle Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	5.6672	2.06	1.12	5.38	9.57	21.6601
2000	1.6	4.6	12.3173	2.07	1.33	2.45	9.38	42.1375
1999	0.3	4.4	8.7530	2.57	1.44	1.47	9.32	39.2735
1998	8.1	-10.5	7.6522	10.16	3.38	3.61	9.32	24.9098
1997	5.6	-1.4	12.2384	12.46	21.96	0.20	9.51	10.4222
1996	5.9	5.9	27.4663	32.89	0.47	2.22	9.55	23.3905
1995	5.8	9.2	8.1381	76.16	0.27	3.64	9.34	50.4191
1994	5.0	9.0	2.9145	10.72	0.29	-0.50	8.79	31.0202

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	10,631.25	6,457.66	358.56	0.0555	0.3779	0.6221	0.3246
5.75	8,640.63	5,623.80	491.20	0.0813	0.3943	0.6057	0.6586
7.92	17,171.88	6,126.76	623.68	0.1062	0.2630	0.7370	0.5063
10.52	6,387.50	8,142.88	703.80	0.0986	0.5604	0.4396	0.4786
12.44	1,400.00	12,607.46	528.56	0.0509	0.9001	0.0999	0.7216
13.89	10,150.00	2,433.93	325.29	0.0433	0.1934	0.8066	1.4793
14.69	14,262.50	1,367.44	240.43	0.1265	0.0875	0.9125	0.5440
18.81	10,237.50	846.14	105.50	0.0953	0.0763	0.9237	0.3303

APPENDIX A.7

(Shin Corporation Public
Company Limited)



BALANCE SHEET 1994-2001

Company : SHIN CORPORATION PUBLIC COMPANY LIMITED (SHIN)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	1,084.86	1,052.11	1,565.76	3,227.68	1,584.05	1,260.45	1,170.47	1,427.98
SHORT-TERM INVESTMENTS	1,207.46	2,407.36	1,721.93	3,245.21	5,080.29	3,595.13	11,361.92	6,275.69
TRADE ACCOUNTS AND NOTES RECEIVABLE	1,877.88	1,698.31	1,384.44	3,880.96	5,284.97	4,885.50	3,795.20	2,847.88
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	14.94	102.34	4.61	187.43	340.33	517.40	523.58	503.46
INVENTORIES	112.71	198.24	243.61	870.26	1,446.07	958.82	634.37	544.67
OTHER CURRENT ASSETS	613.87	1,012.09	494.43	1,436.23	1,577.84	1,254.19	673.45	646.97
TOTAL CURRENT ASSETS	4,911.71	6,470.45	5,414.77	12,847.77	15,313.55	12,471.49	18,158.98	12,246.65
INVESTMENT AND LOANS	62.93	52.00	49.50	201.41	3,072.85			
INVESTMENT AND LOANS TO RELATED PARTIES	18,770.06	13,376.73	9,237.46	733.37	4,562.42	5,458.89	2,232.23	1,248.37
PROPERTY, PLANT AND EQUIPMENT, NET	15,088.25	15,648.74	9,101.80	41,537.31	35,705.90	3,224.74	1,440.58	1,362.84
OTHER ASSETS	2,523.55	2,331.17	1,762.50	2,468.05	1,245.42	24,184.09	18,075.40	15,540.53
TOTAL ASSETS	41,356.50	37,879.10	25,566.03	57,787.91	59,900.14	45,339.21	39,907.20	30,398.40
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	5,990.10	5,066.97	1,174.61	5,482.12	7,561.18	3,037.07	4,085.84	3,604.00
TRADE ACCOUNTS AND NOTES PAYABLE	1,667.58	1,751.22	597.62	10,170.77	9,362.59	6,527.75	5,289.01	3,526.99
CURRENT PORTION OF LONG-TERM LIABILITIES	2,285.25	2,143.67	1,198.41	10,184.07	8,833.43	1,148.29	1,787.75	1,317.89
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	0.83	12.10	0.70	16.74	91.96	1,228.04	222.22	69.58
OTHER CURRENT LIABILITIES	3,454.50	4,035.23	3,472.62	3,630.90	2,047.08	1,233.76	1,201.45	1,127.11
TOTAL CURRENT LIABILITIES	13,398.25	13,009.19	6,443.95	29,484.59	27,896.24	13,174.91	12,586.27	9,645.57
LONG-TERM LIABILITIES	3,615.19	2,818.39	4,474.99	13,672.39	18,747.47	10,134.82	8,210.67	5,813.48
LOANS	3,615.19	1,318.39	1,474.99	8,672.39	17,147.47			
DEBT INSTRUMENTS		1,500.00	3,000.00	5,000.00	1,600.00			
OTHER LIABILITIES	384.31	1,946.99	86.74	3,449.95	4,156.61	3,807.76	3,336.36	2,733.93
TOTAL LIABILITIES	17,397.75	17,774.57	11,005.68	46,606.93	50,800.31	27,117.48	24,133.30	18,192.98
MINORITY INTEREST	3,157.25	2,122.99	2,360.22	8,471.72	5,306.25	7,865.04	6,941.06	5,697.11
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	2,937.00	2,937.00	2,772.00	1,386.00	1,386.00	1,386.00	1,386.00	1,386.00
PAID-IN CAPITAL	4,837.50	4,837.50	1,917.00	1,224.00	1,224.00	1,224.00	1,224.00	1,224.00
RETAINED EARNINGS	13,016.52	10,196.33	7,514.96	134.30	1,221.24	7,747.90	6,225.35	3,899.62
APPROPRIATED	500.00	500.00	300.00	300.00	300.00			
UNAPPROPRIATED	12,516.52	9,696.33	7,214.96	(165.70)	921.24			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT					(101.58)			
UNREALIZED GAIN (LOSS) ON FOREIGN CURRENCY TRANSLATION	10.48	10.71	(3.83)	(35.04)	63.93	(1.22)	(2.51)	(1.31)
SHAREHOLDERS' EQUITY	20,801.50	17,981.54	12,200.13	2,709.27	3,793.59	10,356.69	8,832.84	6,508.31
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	41,356.50	37,879.10	25,566.03	57,787.91	59,900.14	45,339.21	39,907.20	30,398.40

INCOME STATEMENT 1994-2001
Company : SHIN CORPORATION PUBLIC COMPANY LIMITED (SHIN)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	8,642.18	6,868.13	4,539.99	22,806.82	24,539.69	20,150.25	18,633.46	13,853.59
EQUITY INCOME	1,371.96	2,847.94	1,322.99	(2,292.94)	(976.68)			
OTHER INCOME	2,377.65	965.51	11,848.40	8,418.96	1,445.53	1,081.20	2,417.70	2,337.68
TOTAL REVENUES	12,391.78	10,681.58	17,711.38	28,932.83	25,008.54	21,231.45	21,051.16	16,191.27
COST OF SALES	6,060.46	4,611.43	2,875.77	13,818.15	13,350.55	9,785.40	9,338.68	7,813.10
SELLING AND ADMINISTRATIVE EXPENSES	2,055.76	2,472.12	1,230.26	5,269.51	4,903.85	4,220.29	3,793.94	2,784.49
DIRECTORS' REMUNERATION	3.17	3.44	3.57	5.83	4.12			
INTEREST EXPENSES	691.26	778.38	850.01	2,554.09	1,803.89	897.21	904.31	487.61
OTHER EXPENSES			3,249.86	4,384.12	458.06			
INCOME (LOSS) FROM OPERATION	3,581.14	2,816.21	9,501.91	2,901.13	4,488.08	6,328.56	7,014.23	5,106.06
INCOME TAX EXPENSES	194.25	57.52	99.15	1,875.21	2,596.30	2,080.26	2,238.02	1,634.41
INCOME (LOSS) AFTER INCOME TAX	3,386.89	2,758.69	9,402.76	1,025.92	1,891.78	4,248.30	4,776.21	3,471.64
EXTRAORDINARY ITEMS					(9,088.97)			
MINORITY INTEREST	566.70	374.55	15.41	2,113.96	(1,553.11)	1,616.94	1,480.29	706.26
NET INCOME (LOSS)	2,820.19	2,384.14	9,387.35	(1,088.04)	(5,644.08)	2,631.36	3,295.93	2,765.38
EARNINGS PER SHARE (BAHT)	0.96	8.28	38.87	(7.85)	(40.72)	18.99	23.78	21.51

EBIT	4,272.40	3,594.59	10,351.92	5,455.22	6,291.97	7,225.77	7,918.54	5,593.67
Coverage Ratio	6.18	4.62	12.18	2.14	3.49	8.05	8.76	11.47
Current Ratio	0.37	0.50	0.84	0.44	0.55	0.95	1.44	1.27
IBD (Interest Bearing Debt)	11,891.37	10,041.13	6,848.71	29,355.32	35,234.04	5,413.40	6,095.81	4,991.47
D-E Ratio	0.57	0.56	0.56	10.84	9.29	0.52	0.69	0.77
Capital Size	10.63	10.54	10.15	10.96	11.00	10.72	10.59	10.32
MVE	45,817.20	461,109.00	875,952.00	166,320.00	174,636.00	429,660.00	859,320.00	759,528.00
Closing Price (at the end of the year)	15.60	157.00	316.00	120.00	126.00	310.00	620.00	548.00

Shin Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	0.1482	0.37	0.57	6.18	10.63	5.2235
2000	1.6	4.6	1.0963	0.50	0.56	4.62	10.54	10.9695
1999	0.3	4.4	0.5287	0.84	0.56	12.18	10.15	10.4730
1998	8.1	-10.5	1.6070	0.44	10.84	2.14	10.96	17.0890
1997	5.6	-1.4	2.2255	0.55	9.29	3.49	11.00	20.0450
1996	5.9	5.9	1.2867	0.95	0.52	8.05	10.72	19.9568
1995	5.8	9.2	0.7852	1.44	0.69	8.76	10.59	18.4686
1994	5.0	9.0	1.0350	1.27	0.77	11.47	10.32	23.7454

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	45,817.20	11,891.37	691.26	0.0581	0.2061	0.7939	0.0552
5.75	461,109.00	10,041.13	778.38	0.0710	0.0213	0.9787	0.1110
7.92	875,952.00	6,848.71	850.01	0.1007	0.0078	0.9922	0.1050
10.52	166,320.00	29,355.32	2,554.09	0.1411	0.1500	0.8500	0.1836
12.44	174,636.00	35,234.04	1,803.89	0.0559	0.1679	0.8321	0.2330
13.89	429,660.00	5,413.40	897.21	0.0441	0.0124	0.9876	0.2017
14.69	859,320.00	6,095.81	904.31	0.1571	0.0070	0.9930	0.1852
18.81	759,528.00	4,991.47	487.61	0.0880	0.0065	0.9935	0.2386

APPENDIX A.8

(Telecomasia Corporation
Public Company Limited)



Company : TELECOMASIA CORPORATION PUBLIC COMPANY LIMITED (TA)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	2,684.26	1,054.62	2,903.14	2,706.10	2,451.84	9,999.42	10,444.59	11,002.70
SHORT-TERM INVESTMENTS	177.34	288.80	1,459.97	580.91	1,341.61	5,159.86	8,925.07	7,236.12
TRADE ACCOUNTS AND NOTES RECEIVABLE	5,540.69	5,834.25	5,120.76	4,192.10	3,681.86	3,399.25	1,488.27	935.41
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	151.62	131.63	169.92	1.66	1,347.43	252.30	776.76	
INVENTORIES	1,113.38	875.72	878.11	965.55	1,314.64	972.82	835.97	95.94
OTHER CURRENT ASSETS	2,640.56	5,416.15	2,360.75	2,559.41	3,003.26	1,358.72	873.25	828.75
TOTAL CURRENT ASSETS	12,307.83	13,601.18	12,892.65	11,005.72	13,140.64	21,142.36	23,343.92	20,098.92
INVESTMENT AND LOANS	3,313.28	4,018.76	2,970.46	3,979.81	5,009.69	167.43	172.16	496.28
INVESTMENT AND LOANS TO RELATED PARTIES	4,492.13	5,430.04	2,546.99	4,385.98	1,209.06	3,683.23	3,843.69	898.12
PROPERTY, PLANT AND EQUIPMENT, NET	64,836.96	64,775.52	80,198.73	84,375.09	82,945.90	8,369.16	4,610.22	2,782.15
LONG-TERM PROJECT DEVELOPMENT UNDER CONSTRUCTION						61,681.34	44,638.22	30,735.94
OTHER ASSETS	1,522.10	558.16	207.11	613.60	832.39	1,887.92	929.22	1,224.30
TOTAL ASSETS	86,472.29	88,383.65	98,815.94	104,360.20	103,137.67	96,931.45	77,537.43	56,235.71
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	3,214.29	1,782.48	53,853.18	741.62	603.71	248.13	141.21	26.01
TRADE ACCOUNTS AND NOTES PAYABLE	2,584.81	1,700.68	1,169.20	1,903.30	6,105.69	3,009.59	2,477.27	347.77
CURRENT PORTION OF LONG-TERM LIABILITIES				22,689.44	14,723.74	5,178.40	15,977.34	12,390.45
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	155.22	83.13		108.63	372.09	20,290.15	71.05	20.36
OTHER CURRENT LIABILITIES	4,639.27	2,534.48	20,201.29	20,467.45	17,311.20	3,188.33	3,594.30	1,951.09
TOTAL CURRENT LIABILITIES	10,593.59	6,100.78	75,223.67	45,910.44	39,116.43	31,914.60	22,261.17	14,735.68
LONG-TERM LIABILITIES	61,944.18	73,075.35	794.20	39,414.80	55,132.04	30,305.22	18,713.53	6,250.08
LOANS	61,944.18	63,819.64	794.20	38,577.98	52,567.24			
OTHERS		9,255.71		836.82	2,564.80			
OTHER LIABILITIES	9,039.49	580.64	10,002.62	21.14	166.49	84.36	48.91	9.42
TOTAL LIABILITIES	81,577.25	79,756.77	86,020.49	85,346.38	94,414.96	62,304.18	41,023.61	20,995.18
MINORITY INTEREST	454.36	498.65	462.62	462.63	593.90	77.21	39.64	57.06
ISSUED & PAID-UP PREFERRED STOCKS/SUBORDINATED CONV. BOND	7,020.00	7,020.00						
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	25,305.00	22,230.00	22,230.00	22,230.00	22,230.00	22,230.00	22,230.00	22,230.00
PAID-IN CAPITAL	9,616.93	9,933.57	11,835.00	11,835.00	11,835.00	11,835.00	11,835.00	11,835.00
RETAINED EARNINGS	(32,902.22)	(29,477.10)	(21,889.70)	(15,643.27)	(26,145.63)	485.05	2,409.17	1,118.47
APPROPRIATED	34.88	34.88	34.88	34.88	34.88			
UNAPPROPRIATED	(32,937.10)	(29,511.98)	(21,924.58)	(15,678.16)	(26,180.52)			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT	(4,703.37)	(1,682.58)	9.84					
UNREALIZED GAIN (LOSS) ON FOREIGN CURRENCY TRANSLATION	104.34	104.34	147.69	129.47	209.44			
SHAREHOLDERS' EQUITY	4,440.68	8,128.24	12,332.83	18,551.19	8,128.81	34,550.05	36,474.17	35,183.47
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	86,472.29	88,383.65	98,815.94	104,360.20	103,137.67	96,931.45	77,537.43	56,235.71

INCOME STATEMENT 1994-2001

Company : TELECOMASIA CORPORATION PUBLIC COMPANY LIMITED (TA)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	20,636.44	19,387.56	12,634.23	11,481.98	12,494.07	9,734.35	4,795.67	1,822.21
EQUITY INCOME	(628.47)	(1,128.45)	(79.01)	(735.55)	77.65			
OTHER INCOME	1,044.60	2,495.54	913.38	15,973.36	1,227.36	2,345.79	4,579.90	3,341.66
TOTAL REVENUES	21,052.57	20,754.65	13,468.60	26,719.79	13,799.08	12,080.14	9,375.57	5,163.87
COST OF SALES	14,926.12	13,807.57	4,669.83	4,432.51	5,697.52	4,417.73	401.51	781.47
SELLING AND ADMINISTRATIVE EXPENSES	4,762.78	3,030.58	6,995.87	5,547.85	5,748.39	5,895.47	3,786.49	2,698.89
DIRECTORS' REMUNERATION	45.72	45.98	36.77	45.80	80.11			
INTEREST EXPENSES	4,718.43	5,676.51	5,874.71	7,154.05	6,362.53	3,529.88	1,846.15	624.64
OTHER EXPENSES		2,817.14	2,127.08		281.15		1,240.41	
INCOME (LOSS) FROM OPERATION	(3,400.48)	(4,623.12)	(6,235.66)	9,539.59	(4,370.61)	(1,762.94)	2,101.01	1,058.87
INCOME TAX EXPENSES	68.93	76.44	118.51	48.94	64.41	105.38	917.17	453.40
INCOME (LOSS) AFTER INCOME TAX	(3,469.42)	(4,699.56)	(6,354.16)	9,490.65	(4,435.02)	(1,868.32)	1,183.85	605.47
CUMULATIVE EFFECT OF CHANGES IN ACCOUNTING PRINCIPLES				975.99				
EXTRAORDINARY ITEMS		1,378.06			(22,273.19)			
MINORITY INTEREST	(44.29)	(13.36)	6.35	(35.72)	(77.52)	55.80	(106.85)	(33.13)
NET INCOME (LOSS)	(3,425.13)	(3,308.15)	(6,360.51)	10,502.36	(26,630.69)	(1,924.12)	1,290.70	638.61
EARNINGS PER SHARE (BAHT)	(1.81)	(1.73)	(2.86)	4.72	(11.98)	(0.87)	0.58	0.29

EBIT	1,317.95	1,053.39	-360.95	16,693.64	1,991.92	1,766.94	3,947.16	1,683.51
Coverage Ratio	0.28	0.19	-0.06	2.33	0.31	0.50	2.14	2.70
Current Ratio	1.16	2.23	0.17	0.24	0.34	0.66	1.05	1.36
IBD (Interest Bearing Debt)	65,313.69	65,685.25	54,647.38	62,117.67	68,266.78	25,716.68	16,189.60	12,436.82
D-E Ratio	14.71	8.08	4.43	3.35	8.40	0.74	0.44	0.35
Capital Size	11.37	11.39	11.50	11.56	11.54	11.48	11.26	10.94
MVE	25,811.10	40,014.00	108,371.25	33,345.00	19,562.40	118,930.50	170,059.50	155,610.00
Closing Price (at the end of the year)	10.20	18.00	48.75	15.00	8.80	53.50	76.50	70.00

TA Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	1.9975	1.16	14.71	0.28	11.37	7.7453
2000	1.6	4.6	4.7642	2.23	8.08	0.19	11.39	14.7481
1999	0.3	4.4	5.5997	0.17	4.43	-0.06	11.50	25.7224
1998	8.1	-10.5	19.8379	0.24	3.35	2.33	11.56	43.0713
1997	5.6	-1.4	10.3501	0.34	8.40	0.31	11.54	19.3308
1996	5.9	5.9	11.0610	0.66	0.74	0.50	11.48	56.7366
1995	5.8	9.2	3.0302	1.05	0.44	2.14	11.26	27.4512
1994	5.0	9.0	3.6689	1.36	0.35	2.70	10.94	34.2229

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	25,811.10	65,313.69	4,718.43	0.0722	0.7167	0.2833	0.1455
5.75	40,014.00	65,685.25	5,676.51	0.0867	0.6214	0.3786	0.2900
7.92	108,371.25	54,647.38	5,874.71	0.0976	0.3352	0.6648	0.3525
10.52	33,345.00	62,117.67	7,154.05	0.1225	0.6507	0.3493	1.0733
12.44	19,562.40	68,266.78	6,362.53	0.0976	0.7773	0.2227	0.6295
13.89	118,930.50	25,716.68	3,529.88	0.0751	0.1778	0.8222	0.6787
14.69	170,059.50	16,189.60	1,846.15	0.0881	0.0869	0.9131	0.2948
18.81	155,610.00	12,436.82	624.64	0.0436	0.0740	0.9260	0.3671

APPENDIX A.9

(Thai Telephone and
Telecommunication Public
Company Limited)



Company : THAI TELEPHONE & TELECOMMUNICATION PUBLIC COMPANY LIMITED (TT&T)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	697.89	142.41	40.15		69.40	120.78	148.85	216.88
SHORT-TERM INVESTMENTS	850.00		46.00	15.45	2,088.00	1,657.13	1,188.70	5,215.00
TRADE ACCOUNTS AND NOTES RECEIVABLE	1,625.51	3,118.50	2,583.58	2,213.31	1,069.34	3,112.84	755.43	945.55
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES						265.45	302.29	65.13
INVENTORIES	406.61	502.69	615.71	668.01	604.53	793.42	521.87	82.22
OTHER CURRENT ASSETS	495.27	774.40	747.41	2,250.83	1,843.40	1,091.78	404.96	218.27
TOTAL CURRENT ASSETS	4,075.28	4,538.00	4,032.84	5,147.60	5,674.68	7,041.39	3,322.11	6,743.05
INVESTMENT AND LOANS		133.22	132.61	1,465.39	320.00	13,011.57	8,951.24	
INVESTMENT AND LOANS TO RELATED PARTIES								6,163.52
PROPERTY, PLANT AND EQUIPMENT, NET	40,664.52	41,938.79	44,253.26	47,967.21	49,156.54	1,982.08	1,866.99	1,304.86
LONG-TERM PROJECT DEVELOPMENT UNDER CONSTRUCTION						19,935.78	11,454.30	5,939.52
OTHER ASSETS	638.82	4,378.88	3,603.19	534.24	2,848.49	6,762.89	5,111.98	4,461.04
TOTAL ASSETS	45,378.61	50,988.88	52,021.90	55,114.44	57,999.71	48,733.70	30,706.62	24,611.99
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS			0.44	1.47	6.71	197.89	2.57	20.00
TRADE ACCOUNTS AND NOTES PAYABLE	1,070.43	12,179.46	11,429.64	13,491.35	15,454.05	7,324.26	2,630.08	2,774.07
CURRENT PORTION OF LONG-TERM LIABILITIES	249.88	25,147.53	23,569.13	2,759.66	1,951.74			
OTHER CURRENT LIABILITIES	974.46	7,989.93	7,100.23	6,035.09	3,758.67	569.18	468.33	352.93
TOTAL CURRENT LIABILITIES	2,294.77	45,316.91	42,099.42	22,287.57	21,171.17	8,091.33	3,100.98	3,147.00
LONG-TERM LIABILITIES	32,062.19	2,409.53	2,239.65	22,590.53	27,282.15	22,503.52	12,391.01	7,080.86
LOANS	32,062.19	2,409.53	2,239.65	22,590.53	27,282.15			
TOTAL LIABILITIES	34,356.95	47,726.44	44,339.07	44,878.10	48,453.32	30,594.85	15,491.99	10,227.86
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	28,123.24	11,250.00	11,250.00	11,250.00	11,250.00	7,500.00	5,000.00	5,000.00
PAID-IN CAPITAL	670.58	9,360.30	9,360.30	9,360.30	9,360.30	9,360.30	9,360.30	9,360.30
RETAINED EARNINGS	(17,772.16)	(17,347.85)	(12,927.48)	(10,373.96)	(11,063.91)	1,278.55	854.33	23.82
APPROPRIATED	63.36	63.36	63.36	63.36	63.36			
UNAPPROPRIATED	(17,835.52)	(17,411.21)	(12,990.83)	(10,437.32)	(11,127.27)			
SHAREHOLDERS' EQUITY	11,021.66	3,262.45	7,682.83	10,236.34	9,546.39	18,138.85	15,214.63	14,384.12
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	45,378.61	50,988.88	52,021.90	55,114.44	57,999.71	48,733.70	30,706.62	24,611.99

Company : THAI TELEPHONE & TELECOMMUNICATION PUBLIC COMPANY LIMITED (TT&T)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	6,656.02	6,679.76	6,121.92	5,883.69	6,264.05	4,736.59	3,382.93	741.78
OTHER INCOME	200.78	72.09	108.35	4,596.57	323.85	100.11	332.66	629.17
TOTAL REVENUES	6,856.80	6,751.85	6,230.27	10,480.26	6,587.90	4,836.70	3,715.59	1,370.94
COST OF SALES	482.55	435.47	470.80	368.92	801.48	583.89	421.49	
SELLING AND ADMINISTRATIVE EXPENSES	5,439.80	5,456.39	4,944.53	5,300.42	7,116.61	1,173.81	810.42	544.78
DIRECTORS' REMUNERATION	8.77	9.36	8.13	8.72	31.76			
INTEREST EXPENSES	2,514.75	2,813.90	2,913.02	4,096.37	2,956.85	1,095.11	536.20	287.80
OTHER EXPENSES	352.55	2,406.19	391.82			1,296.69	748.80	334.34
INCOME (LOSS) FROM OPERATION	(1,941.62)	(4,369.45)	(2,498.02)	705.83	(4,318.80)	687.20	1,198.69	204.03
INCOME TAX EXPENSES	87.56	50.93	29.19	15.89	16.60	262.99	368.18	13.68
INCOME (LOSS) AFTER INCOME TAX	(2,029.18)	(4,420.38)	(2,527.22)	689.95	(4,335.40)	424.21	830.51	190.36
EXTRAORDINARY ITEMS	1,604.87				(8,007.06)			
NET INCOME (LOSS)	(424.30)	(4,420.38)	(2,527.22)	689.95	(12,342.46)	424.21	830.51	190.36
EARNINGS PER SHARE (BAHT)	(0.25)	(3.93)	(2.25)	0.61	(11.98)	0.64	1.66	0.48

EBIT	573.13	-1,555.55	415.00	4,802.20	-1,361.95	1,782.31	1,734.89	491.83
Coverage Ratio	0.23	-0.55	0.14	1.17	-0.46	1.63	3.24	1.71
Current Ratio	1.78	0.10	0.10	0.23	0.27	0.87	1.07	2.14
IBD (Interest Bearing Debt)	32,312.07	27,557.06	25,809.22	25,351.66	29,240.60	197.89	2.57	20.00
D-E Ratio	2.93	8.45	3.36	2.48	3.06	0.01	0.00	0.00
Capital Size	10.72	10.84	10.86	10.92	10.97	10.79	10.33	10.11
MVE	8,268.23	4,500.00	16,312.50	5,850.00	4,500.00	15,937.50	68,500.00	76,500.00
Closing Price (at the end of the year)	2.94	4.00	14.50	5.20	4.00	21.25	137.00	153.00

TT Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	17.6811	1.78	2.93	0.23	10.72	22.8962
2000	1.6	4.6	18.8663	0.10	8.45	-0.55	10.84	19.3875
1999	0.3	4.4	15.8529	0.10	3.36	0.14	10.86	37.7097
1998	8.1	-10.5	35.9045	0.23	2.48	1.17	10.92	43.9311
1997	5.6	-1.4	18.0111	0.27	3.06	-0.46	10.97	19.9530
1996	5.9	5.9	3.9781	0.87	0.01	1.63	10.79	32.9588
1995	5.8	9.2	2.0662	1.07	0.00	3.24	10.33	24.7861
1994	5.0	9.0	4.4831	2.14	0.00	1.71	10.11	41.1434

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	8,268.23	32,312.07	2,514.75	0.0778	0.7963	0.2037	0.9108
5.75	4,500.00	27,557.06	2,813.90	0.0940	0.8596	0.1404	0.9782
7.92	16,312.50	25,809.22	2,913.02	0.1092	0.6127	0.3873	0.8528
10.52	5,850.00	25,351.66	4,096.37	0.1601	0.8125	0.1875	1.8573
12.44	4,500.00	29,240.60	2,956.85	0.1083	0.8666	0.1334	1.0033
13.89	15,937.50	197.89	1,095.11	0.0744	0.0123	0.9877	0.3330
14.69	68,500.00	2.57	536.20	5.3497	0.0000	1.0000	0.2477
18.81	76,500.00	20.00	287.80	25.5029	0.0003	0.9997	0.4069

APPENDIX A.10

(United Communication
Industry Public Company
Limited)



Company : UNITED COMMUNICATION INDUSTRY PUBLIC COMPANY LIMITED (UCOM)

ITEMS	31 Dec 01	31 Dec 00	31 Dec 99	31 Dec 98	31 Dec 97	31 Dec 96	31 Dec 95	31 Dec 94
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
ASSETS								
CASH ON HAND AND AT BANKS	922.78	590.37	2,703.35	6,712.27	4,170.91	3,051.48	2,557.27	1,120.31
SHORT-TERM INVESTMENTS	60.72	526.57	1,980.83	897.13	213.10	4,589.66	2,808.91	1,545.55
TRADE ACCOUNTS AND NOTES RECEIVABLE	1,806.94	1,191.60	4,687.07	5,073.77	6,339.48	5,268.83	4,502.06	3,090.63
LOANS TO AND AMOUNT DUE FROM RELATED PARTIES	32.38	12.27	429.41	325.78	3,703.67	5,883.37	3,065.78	1,141.11
INVENTORIES	619.28	2,270.03	2,316.54	2,862.28	3,425.96	2,703.66	2,361.89	1,229.36
OTHER CURRENT ASSETS	2,495.07	2,443.41	3,896.30	4,858.09	8,249.28	3,664.91	2,822.87	752.93
TOTAL CURRENT ASSETS	5,937.17	7,034.24	16,013.49	20,729.31	26,102.40	25,161.91	18,118.78	8,879.89
INVESTMENT AND LOANS	958.84	566.78	2,234.21	5,144.34	7,790.82	1,092.14		316.37
INVESTMENT AND LOANS TO RELATED PARTIES	10,056.79	9,278.60	1,507.35	3,287.67	2,418.45	4,824.61	2,325.01	72.67
PROPERTY, PLANT AND EQUIPMENT, NET	2,662.18	2,872.79	45,058.46	45,932.53	46,432.00	38,411.55	3,113.51	698.36
OTHER ASSETS	403.31	620.42	10,353.38	11,123.01	20,255.28	3,055.42	21,562.65	9,359.20
TOTAL ASSETS	20,018.29	20,372.83	75,166.88	86,216.85	102,998.95	72,545.63	45,119.95	19,326.50
LIABILITIES AND SHAREHOLDERS' EQUITY								
BANK OVERDRAFTS AND SHORT-TERM LOANS	8.68	144.45	169.00	3,559.08	16,236.58	6,633.00	3,917.76	6,533.35
TRADE ACCOUNTS AND NOTES PAYABLE	2,264.83	1,904.89	1,986.07	5,587.60	6,260.70	2,765.58	4,586.91	1,622.23
CURRENT PORTION OF LONG-TERM LIABILITIES			3,084.91	3,193.21	2,333.16	561.85	550.41	807.92
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES	286.03	271.83	25.59	23.85	323.57	6.92	30.00	175.72
OTHER CURRENT LIABILITIES	2,449.30	2,945.62	3,657.94	3,610.55	3,027.67	2,313.89	1,405.34	996.79
TOTAL CURRENT LIABILITIES	5,008.84	5,266.79	8,923.51	15,974.29	28,181.68	12,281.25	10,490.41	10,136.00
TOTAL DEBENTURES						26,081.70	3,690.00	
DEBENTURES						13,954.00	3,690.00	
CONVERTIBLE DEBENTURES						12,127.70		
LOANS FROM AND AMOUNT DUE TO RELATED PARTIES				114.30	88.85		125.94	
LONG-TERM LIABILITIES	7,827.89	9,527.26	52,818.70	57,188.97	42,054.37	3,215.58	3,881.75	348.75
LOANS	3,563.91	4,451.93	17,336.96	18,146.33	15,970.21			
DEBT INSTRUMENTS	4,263.98	5,075.33	33,167.16	26,081.70	26,081.70			
OTHERS			2,314.59	12,960.94	2.47			
OTHER LIABILITIES	271.50	276.37	6,435.86	6,177.31	31,462.23	7,161.09	4,674.98	1,503.81
TOTAL LIABILITIES	13,108.23	15,070.42	68,178.07	79,454.88	101,787.14	48,739.62	22,863.08	11,988.56
MINORITY INTEREST	97.60	93.88	3,323.61	2,206.97	494.33	4,211.40	3,753.69	6.64
ISSUED AND PAID-UP SHARE CAPITAL - COMMON STOCKS	4,346.68	4,346.68	4,346.68	2,354.02	2,354.02	2,339.62	2,339.62	1,170.00
WARRANTS			1,306.26	1,306.26	1,306.26	1,306.26	1,306.26	
PAID-IN CAPITAL		15,396.85	12,288.04	8,735.24	3,794.85	9,665.44	10,102.14	3,740.00
RETAINED EARNINGS	(4,673.23)	(13,815.86)	(14,275.79)	(7,840.52)	(11,959.29)	6,436.81	4,755.15	2,421.30
APPROPRIATED	17.48	294.60	612.93	612.93	609.75			
UNAPPROPRIATED	(4,690.71)	(14,110.46)	(14,888.72)	(8,453.44)	(12,569.04)			
UNREALIZED LOSS ON SECURITIES FOR INVESTMENT	(765.54)	(719.14)				(153.52)		
OTHER CAPITAL SURPLUSES	7,904.54				5,221.64			
SHAREHOLDERS' EQUITY	6,812.46	5,208.53	3,665.19	4,555.00	717.48	19,594.62	18,503.17	7,331.30
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	20,018.29	20,372.83	75,166.88	86,216.85	102,998.95	72,545.63	45,119.95	19,326.50

Company : UNITED COMMUNICATION INDUSTRY PUBLIC COMPANY LIMITED (UCOM)

ITEMS	c 2001	c 2000	c 1999	c 1998	c 1997	c 1996	c 1995	c 1994
	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT	M.BAHT
SALES	16,627.40	7,387.18	24,731.58	21,091.90	18,812.14	16,082.38	13,689.03	9,975.10
EQUITY INCOME	766.89	(639.42)	(1,647.64)	(332.74)	(132.90)			
OTHER INCOME	227.28	9,802.64	1,146.26	15,978.58	2,850.47	2,468.45	937.75	809.23
TOTAL REVENUES	17,621.57	16,550.40	24,230.20	36,737.74	21,529.70	18,550.82	14,626.78	10,784.33
COST OF SALES	13,828.26	5,646.06	15,310.01	13,611.57	10,637.63	9,463.42	6,922.01	5,711.09
SELLING AND ADMINISTRATIVE EXPENSES	1,296.82	1,842.36	5,806.46	7,487.99	4,505.85	2,874.14	2,641.48	1,845.47
DIRECTORS' REMUNERATION	0.68	27.16			0.20			
INTEREST EXPENSES	734.84	1,291.10	4,114.37	4,587.41	2,680.93	1,577.00	778.61	255.11
OTHER EXPENSES		4,951.27	4,015.00	1,220.65	2,112.23	59.71	33.38	68.00
INCOME (LOSS) FROM OPERATION	1,760.97	2,792.45	(5,015.63)	9,830.12	1,592.87	4,576.56	4,251.30	2,904.66
INCOME TAX EXPENSES	106.93	2,367.81	1,048.00	4,631.67	(264.69)	1,415.93	1,273.29	903.29
INCOME (LOSS) AFTER INCOME TAX	1,654.04	424.64	(6,063.63)	5,198.45	1,857.56	3,160.62	2,978.00	2,001.37
EXTRAORDINARY ITEMS					(21,785.15)			
MINORITY INTEREST	3.72	(35.29)	(152.15)	1,079.68	(2,234.76)	753.68	176.22	
NET INCOME (LOSS)	1,650.32	459.93	(5,911.48)	4,118.77	(17,692.83)	2,406.94	2,801.78	2,001.37
EARNINGS PER SHARE (BAHT)	3.80	1.06	(14.63)	17.50	(75.29)	10.29	12.50	17.11

EBIT	2,495.81	4,083.55	-901.26	14,417.53	4,273.80	6,153.56	5,029.91	3,159.77
Coverage Ratio	3.40	3.16	-0.22	3.14	1.59	3.90	6.46	12.39
Current Ratio	1.19	1.34	1.79	1.30	0.93	2.05	1.73	0.88
IBD (Interest Bearing Debt)	8,122.60	9,943.54	53,783.62	51,118.47	61,034.07	59,365.17	12,004.11	7,516.99
D-E Ratio	1.19	1.91	14.67	11.22	85.07	3.03	0.65	1.03
Capital Size	9.90	9.92	11.23	11.36	11.54	11.19	10.72	9.87
MVE	7,606.69	15,322.05	14,452.71	4,590.34	4,472.64	40,709.39	75,335.76	40,950.00
Closing Price (at the end of the year)	17.50	35.25	33.25	19.50	19.00	174.00	322.00	350.00

Ucom Independent and Dependent variables for years 1994-2001

Year	Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
2001	1.6	1.8	0.9864	1.19	1.19	3.40	9.90	7.9194
2000	1.6	4.6	4.2250	1.34	1.91	3.16	9.92	19.9282
1999	0.3	4.4	7.2196	1.79	14.67	-0.22	11.23	16.2639
1998	8.1	-10.5	8.3775	1.30	11.22	3.14	11.36	9.8533
1997	5.6	-1.4	2.6117	0.93	85.07	1.59	11.54	4.8377
1996	5.9	5.9	2.7983	2.05	3.03	3.90	11.19	12.2932
1995	5.8	9.2	1.9060	1.73	0.65	6.46	10.72	20.9037
1994	5.0	9.0	0.7370	0.88	1.03	12.39	9.87	19.2152

Rf % (T-bond@10yrs)	MVE	IBD	Interest Expenses	Kd	Wd	Wc	Kc
4.80	7,606.69	8,122.60	734.84	0.0905	0.5164	0.4836	0.0961
5.75	15,322.05	9,943.54	1,291.10	0.1429	0.3936	0.6064	0.2637
7.92	14,452.71	53,783.62	4,114.37	0.1291	0.7882	0.2118	0.4315
10.52	4,590.34	51,118.47	4,587.41	0.0875	0.9176	0.0824	0.5140
12.44	4,472.64	61,034.07	2,680.93	0.0478	0.9317	0.0683	0.2519
13.89	40,709.39	59,365.17	1,577.00	0.0262	0.5932	0.4068	0.2755
14.69	75,335.76	12,004.11	778.61	0.0218	0.1374	0.8626	0.2399
18.81	40,950.00	7,516.99	255.11	0.0261	0.1551	0.8449	0.2241

APPENDIX B

(Dependent and
Independent Variables)



Table 5.1: Dependent and Independent Variables

Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
1.6	1.8	0.0613	0.94	1.23	7.40	11.64	4.2459
1.6	4.6	1.6428	1.22	0.49	15.92	10.99	13.5973
0.3	4.4	0.6627	0.87	0.33	7.63	10.59	11.1180
8.1	-10.5	1.5890	0.51	0.93	4.83	10.63	18.0156
5.6	-1.4	1.6303	0.73	0.83	10.86	10.47	20.0992
5.9	5.9	2.1182	0.79	0.23	21.89	9.99	24.1260
5.8	9.2	0.6044	1.04	0.51	14.94	9.91	17.5942
5.0	9.0	0.0073	1.28	0.80	10.54	9.65	18.7533
1.6	1.8	7.6541	3.13	0.14	-1.51	7.73	31.7785
1.6	4.6	22.0666	0.81	0.51	-0.58	7.77	40.9974
0.3	4.4	8.9030	0.37	4.72	-0.08	7.88	20.8125
8.1	-10.5	40.3208	0.40	3.85	1.53	8.24	23.6139
5.6	-1.4	5.6544	0.87	6.99	-1.62	8.48	7.4344
5.9	5.9	5.4402	0.84	0.86	3.15	8.94	25.3106
5.8	9.2	0.8148	1.67	0.95	3.11	8.62	15.5191
5.0	9.0	-0.1231	1.37	0.45	19.43	8.02	16.9079
1.6	1.8	3.8052	0.62	16.55	1.61	9.80	7.7238
1.6	4.6	8.2630	1.47	65.40	0.56	9.89	12.9759
0.3	4.4	5.6004	1.07	3.23	-1.00	10.13	20.3627
8.1	-10.5	11.6491	0.70	1.75	1.44	10.16	26.0553
5.6	-1.4	13.3339	1.00	1.43	0.05	10.07	38.6153
5.9	5.9	6.7012	1.37	0.44	2.87	10.03	38.3980
5.8	9.2	-0.0151	1.27	0.38	5.45	9.74	14.1202
5.0	9.0	0.9416	1.10	0.42	2.72	9.41	22.8791
1.6	1.8	4.0021	0.84	-46.26	1.24	8.96	9.6295
1.6	4.6	5.8090	0.91	-5.40	4.27	9.33	8.3336
0.3	4.4	2.9925	0.84	-11.26	-0.49	9.43	8.7860
8.1	-10.5	12.4743	0.35	6.67	0.42	9.94	8.4746
5.6	-1.4	3.8511	0.77	8.31	-0.33	9.67	12.2208
5.9	5.9	7.8196	0.88	1.70	2.72	9.37	33.6451
5.8	9.2	3.6674	0.95	1.16	3.85	8.87	27.0335
5.0	9.0	0.8414	0.93	1.55	4.46	8.37	20.0139
1.6	1.8	4.6193	2.97	0.62	-0.22	7.94	18.1576
1.6	4.6	9.1869	3.30	0.75	1.57	8.13	28.1598
0.3	4.4	4.6156	4.11	0.68	0.88	8.28	26.1897
8.1	-10.5	18.0973	4.25	0.77	1.19	8.42	45.9005
5.6	-1.4	6.8850	5.39	0.63	2.34	8.36	28.1976
5.9	5.9	12.2600	5.67	0.07	5.56	7.58	71.6394
5.8	9.2	9.2774	2.32	0.88	2.94	6.79	55.5755
5.0	9.0	9.2774	1.88	1.23	2.40	6.66	59.2345
1.6	1.8	5.6672	2.06	1.12	5.38	9.57	21.6601
1.6	4.6	12.3173	2.07	1.33	2.45	9.38	42.1375
0.3	4.4	8.7530	2.57	1.44	1.47	9.32	39.2735
8.1	-10.5	7.6522	10.16	3.38	3.61	9.32	24.9098
5.6	-1.4	12.2384	12.46	21.96	0.20	9.51	10.4222
5.9	5.9	27.4663	32.89	0.47	2.22	9.55	23.3905
5.8	9.2	8.1381	76.16	0.27	3.64	9.34	50.4191
5.0	9.0	2.9145	10.72	0.29	-0.50	8.79	31.0202

Inflation rate (%)	GDP (%)	Beta	Current Ratio	D-E ratio	Coverage Ratio	Capital size	WACC (%)
1.6	1.8	0.1482	0.37	0.57	6.18	10.63	5.2235
1.6	4.6	1.0963	0.50	0.56	4.62	10.54	10.9695
0.3	4.4	0.5287	0.84	0.56	12.18	10.15	10.4730
8.1	-10.5	1.6070	0.44	10.84	2.14	10.96	17.0890
5.6	-1.4	2.2255	0.55	9.29	3.49	11.00	20.0450
5.9	5.9	1.2867	0.95	0.52	8.05	10.72	19.9568
5.8	9.2	0.7852	1.44	0.69	8.76	10.59	18.4686
5.0	9.0	1.0350	1.27	0.77	11.47	10.32	23.7454
1.6	1.8	1.9975	1.16	14.71	0.28	11.37	7.7453
1.6	4.6	4.7642	2.23	8.08	0.19	11.39	14.7481
0.3	4.4	5.5997	0.17	4.43	-0.06	11.50	25.7224
8.1	-10.5	19.8379	0.24	3.35	2.33	11.56	43.0713
5.6	-1.4	10.3501	0.34	8.40	0.31	11.54	19.3308
5.9	5.9	11.0610	0.66	0.74	0.50	11.48	56.7366
5.8	9.2	3.0302	1.05	0.44	2.14	11.26	27.4512
5.0	9.0	3.6689	1.36	0.35	2.70	10.94	34.2229
1.6	1.8	17.6811	1.78	2.93	0.23	10.72	22.8962
1.6	4.6	18.8663	0.10	8.45	-0.55	10.84	19.3875
0.3	4.4	15.8529	0.10	3.36	0.14	10.86	37.7097
8.1	-10.5	35.9045	0.23	2.48	1.17	10.92	43.9311
5.6	-1.4	18.0111	0.27	3.06	-0.46	10.97	19.9530
5.9	5.9	3.9781	0.87	0.01	1.63	10.79	32.9588
5.8	9.2	2.0662	1.07	0.0002	3.24	10.33	24.7861
5.0	9.0	4.4831	2.14	0.0014	1.71	10.11	41.1434
1.6	1.8	0.9864	1.19	1.19	3.40	9.90	7.9194
1.6	4.6	4.2250	1.34	1.91	3.16	9.92	19.9282
0.3	4.4	7.2196	1.79	14.67	-0.22	11.23	16.2639
8.1	-10.5	8.3775	1.30	11.22	3.14	11.36	9.8533
5.6	-1.4	2.6117	0.93	85.07	1.59	11.54	4.8377
5.9	5.9	2.7983	2.05	3.03	3.90	11.19	12.2932
5.8	9.2	1.9060	1.73	0.65	6.46	10.72	20.9037
5.0	9.0	0.7370	0.88	1.03	12.39	9.87	19.2152

APPENDIX C

(The statistical results from
SPSS program.)

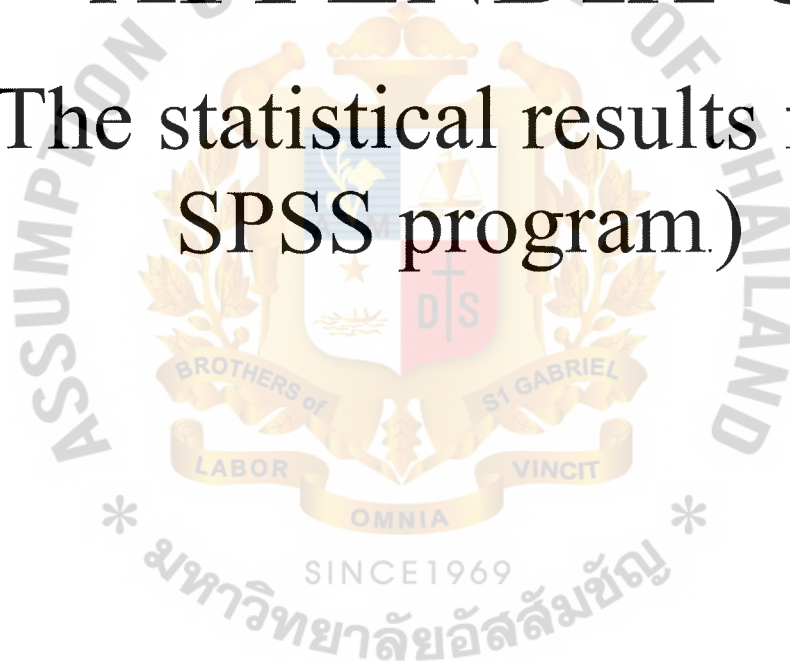


Table 5.2 **Model Summary^a**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.404 ^a	.164	.153	12.69055	.164	15.256	1	78	.000	1.798
2	.526 ^b	.277	.258	11.87529	.113	12.077	1	77	.001	
3	.601 ^c	.362	.336	11.23243	.085	10.066	1	76	.002	
4	.636 ^d	.405	.373	10.91928	.043	5.422	1	75	.023	

a. Predictors: (Constant), Systematic Risk

b. Predictors: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

Table 5.3 **ANOVA^a**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2457.025	1	2457.025	15.256	.000 ^a
	Residual	12561.90	78	161.050		
	Total	15018.93	79			
2	Regression	4160.190	2	2080.095	14.750	.000 ^b
	Residual	10858.74	77	141.023		
	Total	15018.93	79			
3	Regression	5430.202	3	1810.067	14.347	.000 ^c
	Residual	9588.724	76	126.167		
	Total	15018.93	79			
4	Regression	6076.630	4	1519.157	12.741	.000 ^d
	Residual	8942.296	75	119.231		
	Total	15018.93	79			

a. Predictors: (Constant), Systematic Risk

b. Predictors: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

Table 5.4 **Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	18.693	1.930		9.684	.000		
	Systematic Risk	.724	.185	.404	3.906	.000	1.000	1.000
2	(Constant)	14.086	2.241		6.287	.000		
	Systematic Risk	1.027	.194	.574	5.291	.000	.798	1.253
	GDP Growth (%)	.858	.247	.377	3.475	.001	.798	1.253
3	(Constant)	6.409	3.217		1.993	.050		
	Systematic Risk	1.001	.184	.559	5.447	.000	.796	1.256
	GDP Growth (%)	1.108	.246	.487	4.496	.000	.716	1.396
	Inflation Rate (%)	1.685	.531	.314	3.173	.002	.860	1.162
4	(Constant)	32.066	11.454		2.800	.007		
	Systematic Risk	.904	.184	.505	4.924	.000	.755	1.325
	GDP Growth (%)	.958	.248	.421	3.866	.000	.668	1.496
	Inflation Rate (%)	1.649	.517	.307	3.192	.002	.860	1.163
	Capital Size	-2.479	1.065	-.217	-2.328	.023	.916	1.091

a. Dependent Variable: Weighted Average Cost of Capital

Table 5.5 **Excluded Variables^a**

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Inflation Rate (%)	.171 ^a	1.638	.106	.183	.958	1.043	.958
	GDP Growth (%)	.377 ^a	3.475	.001	.368	.798	1.253	.798
	Current Ratio	.183 ^a	1.778	.079	.199	.983	1.017	.983
	Debt-Equity Ratio	-.200 ^a	-1.962	.053	-.218	1.000	1.000	1.000
	Coverage Ratio	.019 ^a	.164	.870	.019	.835	1.197	.835
	Capital Size	-.299 ^a	-3.013	.004	-.325	.985	1.015	.985
2	Inflation Rate (%)	.314 ^b	3.173	.002	.342	.860	1.162	.716
	Current Ratio	.120 ^b	1.209	.230	.137	.944	1.059	.764
	Debt-Equity Ratio	-.152 ^b	-1.567	.121	-.177	.977	1.024	.780
	Coverage Ratio	-.024 ^b	-.223	.824	-.026	.824	1.213	.712
	Capital Size	-.226 ^b	-2.291	.025	-.254	.917	1.090	.743
3	Current Ratio	.073 ^c	.761	.449	.088	.919	1.089	.675
	Debt-Equity Ratio	-.149 ^c	-1.626	.108	-.185	.977	1.024	.701
	Coverage Ratio	-.118 ^c	-1.130	.262	-.129	.765	1.307	.688
	Capital Size	-.217 ^c	-2.328	.023	-.260	.916	1.091	.668
4	Current Ratio	.060 ^d	.640	.524	.074	.915	1.093	.636
	Debt-Equity Ratio	-.111 ^d	-1.211	.230	-.139	.936	1.068	.663
	Coverage Ratio	-.106 ^d	-1.043	.300	-.120	.763	1.310	.640

a. Predictors in the Model: (Constant), Systematic Risk

b. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%)

c. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%)

d. Predictors in the Model: (Constant), Systematic Risk, GDP Growth (%), Inflation Rate (%), Capital Size

e. Dependent Variable: Weighted Average Cost of Capital

Table 5.6 **Descriptive Statistics**

	Mean	Std. Deviation	N
Weighed Average Cost of Capital	23.8057	13.78815	80
Inflation Rate (%)	4.2375	2.56507	80
GDP Growth (%)	2.8750	6.06186	80
Systematic Risk	7.0610	7.70272	80
Current Ratio	3.0279	9.23964	80
Debt-Equity Ratio	3.8643	13.62958	80
Coverage Ratio	3.6077	4.63942	80
Capital Size	9.8360	1.20531	80

Table 5.7 **Residuals Statistics^a**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7.6274	51.3765	23.8057	8.77037	80
Std. Predicted Value	-1.845	3.144	.000	1.000	80
Standard Error of Predicted Value	1.65476	5.61030	2.62872	.74067	80
Adjusted Predicted Value	7.8581	61.3343	23.8452	9.26827	80
Residual	-27.7626	31.9012	.0000	10.63925	80
Std. Residual	-2.543	2.922	.000	.974	80
Stud. Residual	-2.964	3.030	-.001	1.024	80
Deleted Residual	-37.7203	34.3051	-.0395	11.77869	80
Stud. Deleted Residual	-3.133	3.212	.000	1.046	80
Mahal. Distance	.827	19.868	3.950	3.211	80
Cook's Distance	.000	.630	.023	.077	80
Centered Leverage Value	.010	.251	.050	.041	80

a. Dependent Variable: Weighed Average Cost of Capital

Histogram

Dependent Variable: Weighed Average Cost of Capital

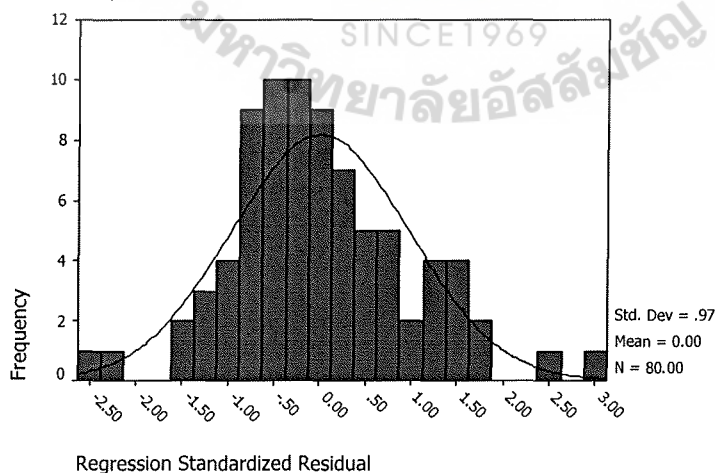


Figure 5.1: Histogram for WACC

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Weigthed Average Cost of Capital

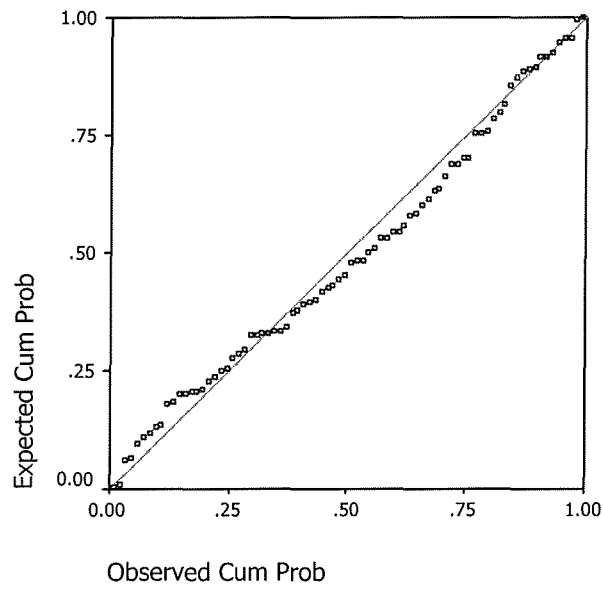


Figure 5.2: Normal P-P Plot of WACC

