CHAPTER THREE

METHODOLOGY

3.1 Data Source

This study uses secondary data. Financial data such as gearing ratios, operating leverage and returns on equity of firms are extracted from the financial statements of public listed companies which are published in the Kuala Lumpur Stock Exchange Annual Handbook.

Data on beta are based on the latest figure as of December 1992, which is published in the beta book with the Exchange Square.

3.2 Sample Size

Only companies from the consumer and industrial products sectors are studied. The rationale as to why both consumer and industrial products are grouped together is because their main activities are manufacturing. This is done in order to isolate or to hold constant the influence of industry classification. So the sample excludes all firms in the trading services, finance, property, construction, plantation, mining and hotel sector.

The sample also excludes public monopolies and newly listed firms. This is because regulated industries' financial structure are determined to a certain extent by the

government. Hence, there is less flexibility on the part of management to decide on their debt-equity mix. As for newly listed companies, there is not enough financial data to justify their inclusion.

In order to minimise biases in the selection of sample, only firms whose main activities are manufacturing will be chosen. This is necessary as there are firms which are so well diversified that their main activities are no longer manufacturing based. Within these constrains, a sample size of 60 companies from both sectors that are listed on the Main Board of Kuala Lumpur Stock Exchange are selected out of a total of 120 firms.

3.3 Time Frame

The study spans a 10-year period from 1984 to 1993. There are two main reasons why the above period is chosen. First, our market for debt instruments is still in its development stage. So firms in the past, have to rely heavily on financial intermediaries in their debt financing. With the setting up of the bond market in the late 1980s, the financing options that are available to firms have increased to a certain extent. Secondly, firms have an optimum targeted capital structure in which they strive to achieve over a period of years through constant adjustments in respond to changes in the external environment. It is felt that firms in a developing capital market like ours would have made the adjustment towards

their targeted capital structure over the period from 1972 to 1983. This explains why data from 1972 to 1983 are excluded.

3.4 Definition of Variables

The following variables are used in the study:

i   gearing ratios

ii   return on equity

iii operating leverage

iv   beta

Gearing ratio is calculated using two formulae. In the first formula:

GEARING 1 = TOTAL DEBTS / TOTAL ASSETS

Total debts include both current liabilities as well as long-term debts. Total assets include current assets and fixed assets but exclude intangible assets.

The second formula that is used to measure gearing is:

GEARING 2 = TOTAL LONG-TERM DEBTS / TOTAL ASSETS

In this formula, only long-term debt are included. Total assets include both current assets and fixed assets but exclude intangible assets. Long-term debts are valued at book value. Book value instead of market value is used

because the majority of firms in Malaysia do not have public debt issues as the bond market is only in its development stage. Therefore, the book value of debt in the sample firms is unlikely to be substantially different from its market value. So, the book value will be used as a surrogate for market value of debt.

Return on equity is taken to be the proxy for profitability and it is calculated as follows:

$$ROE = \frac{EARNINGS}{TOTAL\ ORDINARY\ SHAREHOLDERS'\ FUND}$$

Earnings are based on after tax profit before extraordinary items, after minority interests and pre-acquisition profits and deducting the amount of dividends paid to preference shares. Total shareholders' fund comprises issued share capital, reserves, unappropriated profit. Prefence shares are excluded.

Operating leverage is measured by:

$$OPERATING\ LEVERAGE = TOTAL\ FIXED\ ASSETS\ /\ TOTAL\ ASSETS$$

Total assets include intangible assets.

Computation of Beta

A single index model is used to relate the return on a share to the return in the Kuala Lumpur Stock Exchange Composite Index. Intuitive observation of shares' price movement shows that when the overall share market is performing well, prices of most counters also tend to increase and vice-versa. So we can use a simple linear regression analysis to estimate the relationship between the return on a share and the return on the Composite Index.

The beta of every share that is listed on the Kuala Lumpur Stock Exchange is computed by using the weekly closing returns on the shares and the weekly closing return on the Kuala Lumpur Stock Exchange Index for available data over a 10-year period from 1983 to 1992.

Adjusted Beta

Data for the computation of beta is based on historical data and beta will change from year to year. Beta of individual share will also tend to regress towards the mean of one. This could be due to the conscious effort on the part of management to move the firm to assume the typical characteristics of the market. Firms that are very risky tend to diversify to make their risk lower while low risk firms will take on more risky investments to increase their returns.

In view of these limitations, there are several techniques that can be used to adjust historical beta in order to improve our estimate of future beta. These techniques yield adjusted beta which gives a better measurement of the future market risk of a share. One of these forms of adjusted beta is Blume's adjusted beta and it is the beta that will be used here to relate against gearing ratio.

3.5 Data Analysis

The data on gearing ratios, return on equity and degree of operating leverage are tabulated and then **averaged out over the ten-year period** for each firm. A simple regression analysis will then be performed using a Lotus 1-2-3 programme to determine whether there is a significant relationship between the following variables.

i)   Mean TD/TA against Mean ROE of all sixty firms.

ii) Mean LTD/TA against Mean ROE of all sixty firms.

iii) Mean TD/TA against Mean FA/TA of all sixty firms.

iv) Mean LTD/TA against Mean FA/TA of all sixty firms.

v)   Mean TD/TA against Blume's beta of all sixty firms.

vi) Mean LTD/TA against Blume's beta of all sixty firms.

3.6 Hypothesis Testing

The following hypothesis are tested.

H_{10}: There is no difference in financial structure among firms with various returns on equity level.

H_{11}: There is a difference in financial structure among firms of various returns on equity level.

H_{20}: There is no difference in financial structure among firms with various operating leverages.

H_{21}: There is a difference in financial structure among firms of various operating leverages.

H_{30}: There is no difference in financial structure among firms with various systematic risks.

H_{31}: There is a difference in financial structure among firms of various systematic risks.