CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

This chapter is divided into two main parts. The first part relates to the theoretical background of the study. The second part relates to past empirical literature on company performance, accounting and market indicators, and stock volatility.

In the theoretical background section, the study introduces some basic concepts and theories on asset pricing models, accounting analysis techniques, and accounting and market indicators. The second section presents a systematic review of company performance to determine its main dimensions and to summarise important related studies. In addition, this chapter surveys the empirical literature on the relationship between company performance and stock volatility. It's will also formulate the hypotheses that will be tested with the empirical models and describes the proposed research framework. Lastly, this chapter will highlight gaps in the literature.

3.2 Basic Concepts

Firstly, some basic concepts and financial terms are introduced to facilitate better understanding of the research. The thesis explains well-known performance measurement models that are based on risk, return, and accounting and market indicators.

3.2.1 Performance

The word 'performance' was used in the mid-twentieth century to indicate a specific outcome, such as the result of a horse race or sports competition. Therefore, sports were 'continuous research in performance', and sports competitions were regarded as measurable processes that create value. The term performance is used to provide numerical indicators that characterise certain possibilities in reference to the desired objectives. Currently, the term is used in many areas, but especially in the fields of administration, economics, and accounting. While the significant differences between sports and accounting, there is still a sense of connection between them. If the performance of an athlete can be defined as his achievement of certain predetermined objectives or of better results than his rivals, then the performance of an economic entity can be defined as its accomplishment of certain targets or of better results than its competitors. The performance of an economic entity is therefore founded on the idea of comparison (Pintea & Achim, 2013).

3.2.2 Company Performance

In economics, there is several definitions regarding the concept of performance; their differences largely rest on the perspectives of the users of performance information. Current and potential investors see performance as the profitability of their

investments; managers consider it as the overall operations of the companies that they manage; employees recognize the concept as the stability and profitability of their jobs; and creditors see performance as a company's profitability, stability, and ability to service debts. However, this section presents the historical view of the evolution of company performance and the importance of performance measurements in the past.

Over the last four decades, there have been several attempts to provide a general definition for performance in general and to apply the concept of performance in economic and financial sciences to different types of companies. Baird (1986) viewed the concept of performance as "a direct action that should be expressed by a verb", though in most cases the word either refers to an action (verb), event (results), or simultaneously both. Niculescu & Lavalette (1999) and Bourguignon (1995) argued that the term company performance produces three simultaneous interpretations: "action", "outcome", and "success". They agreed that "action" relates to the purpose of the company, "outcome" the achievements for the expended resources, and "success" to the environment in which the company is located. In other words, the first concept refers to the company's mission, the second to how well it manages its resources, and the third to its ability to adapt to external factors.

Bourguignon (1995) presented three acceptable approaches to company performance. First, performance is action, that is, a process and not a result that appears every time; its content is almost secondary to its own dynamics. Second, performance is the result of an action that is subsequently evaluated. Third, performance means success. Performance does not exist independently; rather, it is defined by the different users of accounting information, hence some may perceive the accomplishment of certain indicators as a success, but others would not share a similar view.

Verboncu & Zalman (2005) defined company performance as “a particular result obtained in management, economics, accounting and marketing that print features of competitiveness, efficiency, and effectiveness of the organisation and its procedural and structural components.” Performance as a concept therefore is synonymous to competitiveness.

Based on previous literature, the current study defines the company's performance as the outcomes of the company situation that reflect the efficiency of operational activities and its reputation. It is given as a set of values to identify the growth rate of shareholder wealth. In addition, the numbers of these outcomes can directly use to analyze performance in various manners. Then, interpret the past and current achievements and predict the company performance in the future. Nowadays, mathematical models have been evolved to measure company performance. Therefore, the current study uses performance measures that reflect the efficiency of company operational activities to construct a scale of their relationships towards the company's performance in the market under a set of given investment risks. The investment risks are clarified in the following section.

3.2.3 Investment Risk

Every type of investment is exposed to some degree of investment risk. Investment risk is defined as the probability or uncertainty of losses rather than expected profit from investment due to a fall in the price of securities. This section explains the concepts of some investment risks included in the theories used in the current study.

Mathematically, risk is the standard deviation and is termed as variance. In finance, risk is defined as the standard deviation of stock returns, which indicates the variability of returns. It is always used to measure the uncertainty of stock returns.

Higher variance means higher stock volatility, signifying that the stock has higher risk (Gitman, 2003, p. 214).

Risk can be classified into at least four types. First, systematic risk, which is the risk that remains even after diversification. It is also known as market risk or non-diversifiable risk (Bierman, 1980). Second, firm-specific risk, which is the risk that can be eliminated by diversification (Strong, 2008, p. 168). Third, risk-free rate (RF), which is the risk inherent in risk-free assets (Elton & Gruber, 1977). In practice, investors utilise various money market instruments as risk-free assets in their portfolios, since they assume that such instruments are highly safe when the market gives rise to a credit crisis (Evans & Archer, 1968). Fourth, risk premiums, which are additional returns that investors will or expect to receive by holding on to riskier assets. They measure the payoff for taking various types of risk (Jones, l996, p. 246). Risk premium is the expected return, and the difference between the actual rate of return of an asset and risk-free rate is defined as the excess return (Siegel, 1999).

3.3 Measuring Company Performance

In economics, there are several measurements for company performance. Their differences largely rest on the type of information required by users. Company owners measure performance as the profitability of the company; managers measure it as the net gains of the operational activities of the company; and creditors measure performance as a company's ability to cover debts. Return on assets (ROA) and return on equity (ROE) are considered as the best metrics for owners, managers, and creditors. Investors also consider performance as the profitability of the company (ROA and ROE). With the development of financial markets, shareholders have become numerous, as represented by the stocks. The financial market regulates the trading of company stock and its value is reflected in its price. Other metrics were then introduced to measure the performance of companies. However, the market is not free from manipulation. Rumors, speculation, and short selling are among the manipulation activities that result in fluctuating stock prices. Thus, stock prices become more important than other metrics, especially from the investors' perspective. Furthermore, the differences between stock prices have led to another important measure of performance over time, which is stock return. It is calculated by the difference between current and previous stock price. Moreover, investors assume that the stocks of companies with good performance will have a higher demand, hence increasing their prices, and vice versa (Shamsudin, Mansor, & Ismail, 2013). Sekirin (2010) mentioned that the performance of a company can be represented by its stock price and return, as they often are good indicators of how well the company is doing. This suggests that stock price and return reflects a company's performance. Accordingly, the main theories and measurement used in this study will present in the following sections.

3.4 Theoretical Background

The theoretical background clarifies the theories that are counting on to build the proposed theoretical framework, extract the study variables, and formulate the hypotheses. The current study primarily builds a one-of-a-kind investigation based on the EMH theory. This theory referred to the information of companies. The fundamental analysis offers relevant information on the operational activities of companies. This information is obtained from the accounting analysis using accounting and market indicators. In addition, the asset pricing theory offers relevant information about companies. CAPM and Jensen's alpha model were used to extract the information of companies in the market. That with Stock price, return, and its volatility. Figure 3.1 explains the main theories used in this study.

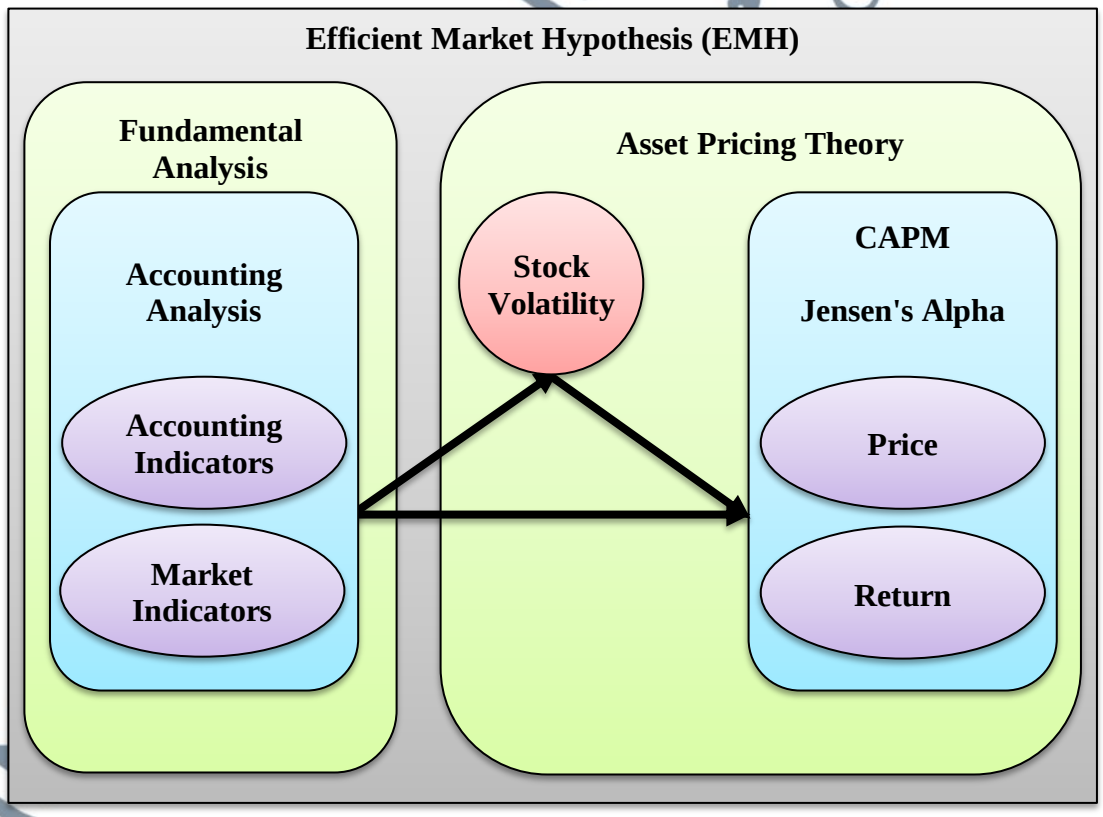


Figure 3.1: Main Theories of Study

3.4.1 Efficient Market Hypothesis (EMH)

The efficient market hypothesis (EMH) was widely tested in accounting, economics, and financial research. It states that share prices reflect all information in the market. All investors have the same access to relevant information at minimum cost. In addition, the stocks trade at their fair market value (Fama, 1970). Decades ago, the EMH was widely accepted by academics and financial economists. It was generally believed that stock markets were highly efficient in reflecting information about individual stocks and the stock market as a whole. The widely held belief was that when new information becomes available, it spreads swiftly and is immediately absorbed into the values of stocks. Thus, neither technical nor fundamental analyses, at least not with equal risk, would enable an investor to earn returns larger than those gained by holding a randomly selected portfolio of individual stocks. Against this view, academics revealed that the EMH is associated with the fundamental analysis, which is the analysis of financial information of companies such as earnings and asset values to help investors select the best stocks (Malkiel, 2003). The logic of this idea is that the flow of company information is unreflected immediately in stock prices, then price change will reflect only news rather than the financial information of companies. When the news unpredictable and resulting price changes must be predictable, the prices should fully reflect all known information to obtain a high rate of return as aspire. Therefore, the current study primarily builds a one-of-a-kind investigation to test the EMH theory besides the following theories.

3.4.2 Asset Pricing Model (APM) Theories

Stock markets are major elements of the global economy and the financial cycle, thus building a model that can price assets accurately is of great significance. Researchers have developed many models throughout the years to investigate stock market movements and to explore the inherent laws of asset valuation. The development of asset pricing theories explained as follows.

The investment theory in financial markets emerged in 1952 when Harry Markowitz introduced formal portfolio selection, which grew to be the basis of the Modern Portfolio Theory (MPT). The theory shows how to diversify assets to produce an efficient portfolio. It assumes that investors are risk averse, and so when selecting portfolios, they focus on the mean and variance of their single-period investment return. Accordingly, investors select a 'mean-variance-efficient' portfolio: one that minimise variance for given expected return and maximise expected return for given variance. This is Markowitz's E-V rule (Markowitz, 1952).

The Modern Portfolio Theory is based on the following assumptions: 1) investors act rationally to maximise their utility, given a level of funds; 2) investors have free access to fair information on risk and return; 3) the market is efficient and absorbs information perfectly; 4) investors are risk averse, trying to maximise return and minimise risk; 5) investor decisions are principally founded on expected returns and expected variance (or standard deviation) of returns; and 6) given a level of risk, investors prefer higher over lower returns. Under these assumptions, the portfolio is said to be efficient if no other portfolios offer lower risks with the same (or higher) expected returns or higher expected returns with the same (or lower) risks (Reilly & Brown, 2012, p. 148).

The Modern Portfolio Theory supports the theoretical framework of the current study in many aspects: Testing the linear relationship between risk and return, verifying the availability of risk and return information to investors, and investigating whether investors are acting rationally to maximize their profits. Markowitz's model is the standard way of selecting a portfolio, though it does not predict the risk premium, which is the focus of investors. Many models have nonetheless been proposed to forecast returns based on his model. The capital market theory has come up with the concept of zero-variance asset, which provides the risk-free rate of return (RF), thus permitting the development of a generalised theory of capital asset pricing (Fama & French, 2004).

William Sharpe (1964) developed the single-factor capital pricing model, relating the returns of each security to the returns of a common factor. The model assumes that security returns are correlated by one factor, responding more in the same factor and less in others. Typically, it assumes the single factor to be the market portfolio return. The model can thus be expressed as:

$$\boldsymbol{R_{i,t} = A + \beta_i\, rm_t + \varepsilon_{i,t}} \qquad \textbf{(3.1)}$$

where $R_{i,t}$ is return of security i; rm_t the market portfolio return; A and β the coefficients; and ε_t the error term. If the error terms of any of the two assets are uncorrelated, then $\mathrm{Cov}(\varepsilon_{it}, \varepsilon_{,jt}) = 0$.

The single-factor model assumes that changes in return on assets are caused by macro, micro, and industrial events. A macro event affects market portfolio returns and cause changes in the returns of all securities. A micro event affects the return of a single security, which affects market line return. An industrial event affects a group of securities but not the returns of all securities (Haugen, 2001).

The single-factor model links the covariance between the returns of stocks to a single factor, generally the market index. Some researchers tried to capture non-market influences by creating multi-factor models. In a well-known study, King (1966) found that the co-movement of securities is not only related to market but also industry effects (Jones 1996, p. 197). Therefore, the multi-factor model suggests that covariance is determined by two or more factors. For example, stock prices move due to the changing rate of inflation and economic growth (Elton & Gruber, 1973). A multi-factor model is often expressed as:

$$E(R_i) = a_i + \beta_i R_m + \beta_z NF + \varepsilon_{i,t} \qquad (3.2)$$

where *NF* is the non-market factor and all other variables. In addition, three, four, or even more factors can be included in the model (Elton & Gruber, 1973).

Comparing between the multi-factor and single-factor models, no conclusive statement can be possibly made for the former, given the large number of likely factors. Cohen & Pogue (1967) argued that the single-factor model leads to lower expected risks and produces more efficient portfolios, while Elton and Gruber (1977) contended that the multi-factor model reproduces historical correlations better than the single-factor model. Nonetheless, the multi-factor and single-factor models contributed towards the development of the final form of the relationship between risk and return: the capital asset pricing model (CAPM). The following section describes the capital asset pricing model and its assumptions.

3.4.3 Capital Asset Pricing Model

The capital asset pricing model (CAPM) is the central predictive model of the financial economy. It came as the final form of all studies on the relationship between risk and return. It was developed by Sharpe (1964), Lintner (1965), and Mossin (1966) with a series of predictions about equilibrium expected returns on risky assets. The prediction of CAPM is mean-variance efficient because of the linear cross-sectional relationship between mean excess returns and market factors (Fama & French, 1992).

CAPM is based on a set of simplified assumptions to facilitate estimations, but they are nonetheless very restrictive and still fundamental to studying the relationship between risk and return. These assumptions are: 1) investors use the Markowitz model to build an investment portfolio; they are risk averse and seek to maximise the expected utility of wealth; 2) investors select their portfolios by looking only at the expected return and variance; 3) investors can lend and borrow unlimitedly at a risk-free rate; 4) all information is available to all investors without cost; and 5) there are no transaction costs or taxes in the markets, and the assets can be divided and traded infinitely (Sharpe, 1964). The CAPM equation is:

$$E(R_i) = R_f + \beta_i\,[E(R_m) - R_f] \qquad (3.3)$$

where $E(R_i)$ is the expected return of stock i; B_i is $Cov(R_i, R_m)/VAR\ (R_m)$; R_f is the risk-free rate of return; and $E(R_m)$ is the expected market return. The model assumes a linear relationship between the expected return on risky assets and β. The latter is an appropriate risk measure in the cross-section of average returns. It supposes that assets can only earn a high average return when they have a high market β.

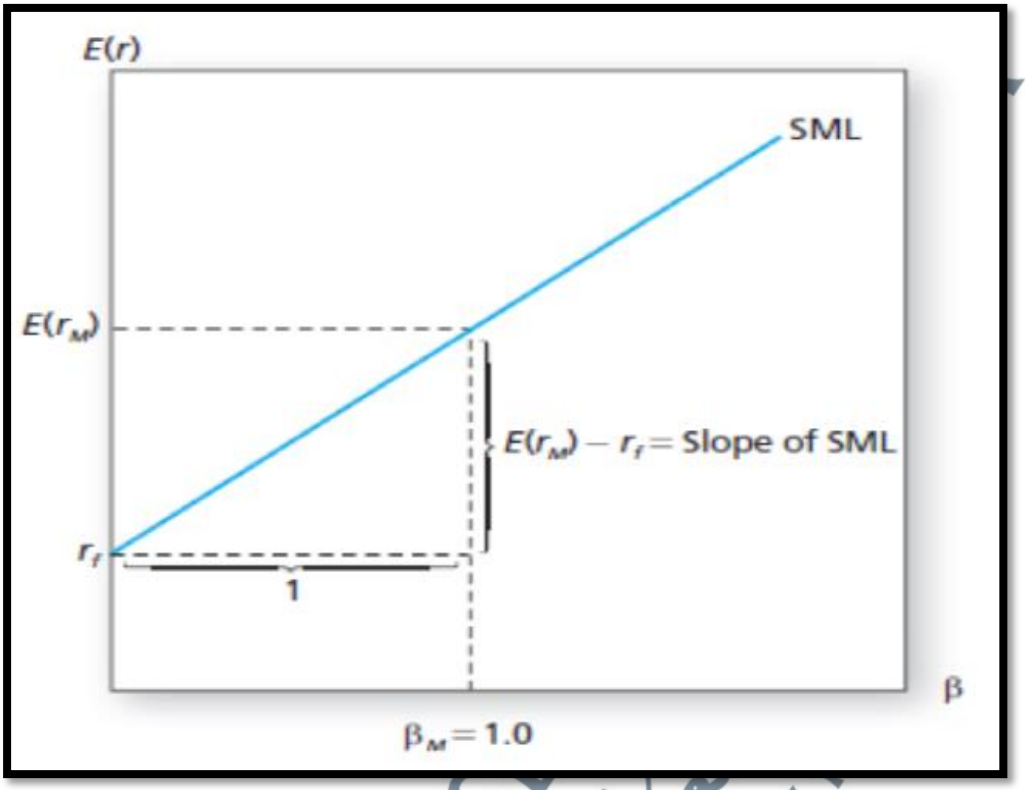
The important issue of CAPM is market portfolio. Citing Tobin (1958), Sharpe (1964) explained that the portfolio selection process follows two stages. First is the selection of a unique optimum combination of risky assets, and second is a separate choice on the allocation of funds between that combination and a single risk-free asset. Practically, investors can obtain a mean-variance-efficient portfolio and minimise variance by selecting a portfolio that combines "a risk-free asset (either risk-free borrowing or lending) and a single-risk tangency portfolio" (Fama & French, 2004).

CAPM has important contributions. One of them is that it only takes systematic risks and creates a linear relation between market risk β and expected return $E(R_i)$. Additionally, the model can be used empirically to predict the price of individual securities. CAPM is also easy to understand and simple to use. In contrast, some researchers have claimed that CAPM assumptions pay no attention about real financial and economic elements, such as taxes. In addition, the CAPM model eliminates unsystematic risks, specifically firm-specific risk (Dhankar & Singh, 2005).

Many investors rely on rewards from stock investment i.e. risk premium. It is expressed as $B_i[E(R_i) - R_f]$ for any security *i* and as a linear function between risk and market risk premium:

$$[E(RM) - R_f] \beta IM \qquad (3.4)$$

Figure 3.2 illustrates the linear relationship between stock return and risk and the graphical representation of CAPM, the security market line (SML). The SML slope is equal to $[E(R_M) - R_f]$, while β reflects the systematic risk. Expected returns, or any other returns, that are under or above the SML are considered mispriced (Sharpe, 1964).



Source: Bodie, Kane, & Marcus (2009, p. 298)

Figure 3.2: Security Market Line (SML)

Based on the capital asset pricing model (CAPM), Michael Jensen developed Jensen's alpha in 1968 to identify skilled portfolio managers in an absolute, rather than a relative, manner. It was originally based on CAPM, which calculates the expected one-period return of any stock or portfolio (Jensen, 1968). The following section presents the Jensen's alpha model (Jensen, 1968).

3.4.4 Jensen's Alpha

The Jensen model is also used to measure historical performance of a portfolio by differentiating between realized return and expected return for a given period. The alpha coefficient (α) is differentiated from the estimated β of CAPM. The latter is estimated by regressing stock return (R_i) on market return (R_m) (Reilly & Brown, 2012 p. 967):

$$\boldsymbol{R_i = \alpha + \beta R_m} \qquad \textbf{(3.5)}$$

where α is the intercept and β is the slope, that is, $Cov(R_j, R_m) / \sigma_m^2$. The slope of the regression shows the beta (risk) value of that stock.

To measure the performance of a stock at a given period, the intercept from the regression is used along with a modified version of the CAPM formula (Equation 2.3):

$$\boldsymbol{R_i = R_f\,(1-\beta) + \beta R_m} \qquad \textbf{(3.6)}$$

The regression in Equation 3.5 is similar to Equation 3.6. This shows that Jensen's alpha coefficient (α) and β is similar to $R_f(1-\beta)$ from the CAPM model. The difference between α and $R_f(1-\beta)$ results in Jensen's alpha, which can be used to measure stock performance at a given period. This measure is used to see whether the company's stocks are either performing or underperforming (Mohd Dali, Mudasir, & AbdulHamid, 2008).

The criteria for the alpha are:

1) $\alpha > R_f\,(1-\beta)$ means that the stock is performing.
2) $\alpha = R_f\,(1-\beta)$ means that the stock is performing as expected.
3) $\alpha < R_f\,(1-\beta)$ means that the stock is underperforming.

The capital asset pricing model (CAPM) and Jensen's alpha model support the theoretical framework of the study by measuring the historical performance of the companies and distinguishing whether their stocks are performing or underperforming, which can help identify investment opportunities. In addition, the companies were ranked according to their performance, thus encouraging companies to improve and develop their activities. This in turn will enhance the trading volume of the companies' stocks.

The asset pricing theories have presented a set of theories relating to firm performance that form the research framework. The basis for developing the model of the study began with stock price and return. Through stock return, the basic measures of firm performance measure were introduced. In addition, several asset pricing models have been described to understand firm performance measurements in the financial market. Accordingly, the theories contribute to the development of the research model, which estimates stock price, return, and firm performance using Jensen's alpha. To complete the construction of the theoretical framework of the study, the theoretical parts of fundamental and accounting analyses are presented in the following sections.

3.4.5 Fundamental Analysis

Financial statement analysis is an important aspect of the broader corporate analysis. Subramanyam and Wild (2009, p. 4) defined it as the "application of analytical instruments and techniques to financial statements to derive estimates and inferences useful in business analysis". Financial statement analysis reduces the uncertainty of business activities and provides an effective systematic decision-making tool for business.

A financial statement shows a set of figures relating to the financial and investment performance of an organisation. The disclosure of each figure is necessary to satisfy the financial information needs of managers, analysts, and investors, as well as to remove, or at least minimise, information asymmetry. The financial statement generally consists of balance sheet, income statement, cash flow statement, and statement of shareholders' equity (Robinson, Greuning, Henry,& Broihahn, 2009, p. 5).

The balance sheet, or statement of financial position, provides information of the accounting system at a specified period. It is based on the accounting formula, 'assets are equal to the sum of liabilities and equity'. The left side equation is the assets and resources controlled by the company for its investment and operations in the form of cash, machineries, buildings, or any other properties. The right side shows the sources of financing and obligations of the company, in addition to shareholders' equity and undistributed profits (Gibson, 2009, p. 46). The income statement provides information about a company's profitability over a period, summarising the results of its activities in the form of incomes, expenses, and profit or loss. The statement also details how the earnings are obtained. The net income refers to the company's profitability and reflects the return on equity during a certain period. The less significant accounts can be grouped into a single line item. It bears noting that net income is not the final cash that the

company has generated, as the figure is recorded not on cash but accrual basis. The cash flow statement shows the cash inflows and outflows at a specified time due to the company's activities (Gibson, 2009, p. 47). The statement of shareholders' equity consists of undistributed profits, comprehensive income, and change in equity. It identifies the reasons for the change in shareholders' claims on the assets of the company. Sometimes, the statement of shareholders' equity is called the statement of changes in owners' equity.

The financial statements can serve as a reference for company performance analysis, sometimes called accounting analysis. This analysis studies the transactions and accounting policies of a company, and how the latter may affect its financial statements (Subramanyam and Wild, 2009, p. 8). Because accounting analysis primarily relies on the company's financial statements, its quality is highly contingent on their authenticity.

In terms of fundamental analysis, accounting analysis using accounting indicators, which represent the operational activities of the company, and market indicators, which represent the value of the company in the market will contribute to the research framework. Accordingly, fundamental analysis contributes to the building of the research framework through the effects of these indicators on stock price, stock return, and firm performance. The following section presents the accounting analysis and its wide used indicators in the fundamental analysis.

3.4.6 Accounting Analysis

Accounting analysis is "a process of evaluating the extent to which a company's accounting reflects economic reality using indicators (ratios)". Among its most popular tools is ratio analysis, which Subramanyam and Wild (2009, pp. 12-13) defined as "a

mathematical relation between two quantities" whose computation is simple but interpretation is more complex. A meaningful ratio is one that refers to an economically important relation. Accounting ratios are one of starting points of an accounting analysis. They act as preliminary tools that can identify areas that require further investigation. By computing a ratio, an analyst can reveal important relations, comparison bases, and trends that may not be readily detected when analysing the individual accounts that constitute the ratio.

Ratios are most useful when they are oriented to the future. Therefore, analysts must assess the factors that can potentially influence the trends and magnitude of the ratios in the future, such as new accounting standards. Ratios are also affected by a number of external factors beyond the internal operating activities, including government policies, accounting standards, industry factors, and economic events. Nevertheless, a good ratio analysis highly depends on its skilful application and interpretation by analysts (Subramanyam & Wild, 2009).

Of the different types of indicators analysis, the current study employed the indicators belonging to two broad categories: accounting and market indicators.

3.4.7 Accounting Indicators

Accounting indicators are the indicators reflect the operational activities of the company. It determine the ability of the company to generate earnings and evaluates its ability to meet obligations. To illustrate, profitability analysis indicators is "the evaluation of a company's return on investment". Profitability means the ability of companies to generate profit from their business activities. It is an indication of the management's efficiency to generate profit using all available resources (Gibson, 2009, p. 297). Harward & Upto (1961) defined profitability as "the ability of a given

investment to earn a return from its use" that can either be distributed to shareholders or reinvested into the company to enhance solvency.

A company's overall value is a key determinant of its ability to generate profit on the capital invested. Analysts consider profitability as the main focus of financial analysis. Profitability indicators measure the company's efficiency to gain profits, design and implement policies, and make investment decisions under different situations. Profitability is the main subject of interest of investors, creditors, and managers.

In addition, credit (risk) analysis indicators aims to evaluate the ability of a company to meet its obligations. Robinson et al. (2009, p. 308) defined credit risk as "the risk of loss caused by a counterpart or debtor's failure to make a promised payment". Credit (risk) analysis depends on three major areas: liquidity, capital structure, and solvency. Subramanyam and Wild (2009, pp. 527-528) explained that liquidity reflects "the availability of company resources to meet short-term cash requirements", while solvency refers to "a company's long-run financial viability and its ability to meet long-term obligations". Capital structure, meanwhile, means the sources of financing of a company.

Furthermore, Liquidity analysis indicators intends to evaluate the ability of companies to generate profit and satisfy working capital requirements from their operating activities. The current ratio is an important indicator of liquidity. It measures the availability of current assets to cover current liabilities. Capital structure and solvency analyses, on the other hand, identify the proportion of debt in the capital structure of a company, as well as assessing risk and financial leverage. Moreover, the analyses can reveal the potential risk-return relation in a company's capital structure and its implications (Gibson, 2009, p. 201).

According to Robinson et al. (2009, p. 152), indicators are important measures of a company's profitability. Return on assets and return on equity are the most commonly used measures of profitability; they should be used to evaluate companies both individually and as a group to identify the drivers of profitability. An important capital structure and solvency indicator is the debt ratio. However, Table 3.1 shows the most important accounting indicators along with their measurements and interpretations.

Table 3.1: Accounting Indicators

#	Ratio	Measurement	Interpretation
1	**Return on Assets**	"(NI + Interest Expense * (1-Tax Rate)) / Average Total Assets"	The return generated by a company for a given level of assets
2	**Return on Equity**	Net Income / Average Shareholders' Equity	The return generated by a company to equity holders
3	**Gross Profit Margin**	(Revenue – Cost of Revenue) / Revenue	The percentage of revenue available to cover operating and other expenditures
4	**Net Profit Margin**	Net Income / Revenue	"Better view of a company's potential future profitability"
5	**Return on total Capital**	EBIT / Short- and long-term debt and equity	"Profits generated by a company on all the capital that it employs"
6	**Current ratio**	Current assets / Current liabilities	"Assets expected to be consumed in relation to liabilities falling due within one year"
7	**Defensive interval ratio**	(Cash + short-term marketable investments + receivables) Daily cash expenditures	"How long the company can continue to pay its expenses from its existing liquid assets without receiving any additional cash inflow".
8	**Debt ratio**	Total liabilities / Shareholders equity	"Amount of debt capital relative to equity capital"
9	**Coverage ratio**	EBIT / Interest payments	"Number of times a company's EBIT could cover its interest payments".

Sources: Robinson et al. (2009, p. 152); Subramanyam and Wild (2009, p. 447); Gibson (2009, p. 298); Brealey, Myers, & Allen, 2011, p. 707)

3.4.8 Market Indicators

Market indicators are the indicators reflect the performance of company in the market. It determine the estimation of intrinsic value of a company stock and product of current share price with the number of shares outstanding. Analysts use a set of methods to evaluate the equity of companies. Valuation analysis, based on valuation indicators, is important to many users of financial statement. A reliable valuation of stocks enables investors to make buy, sell, or hold decisions in relation to investments, credit decisions, business merges, and public stock offerings (Subramanyam & Wild, 2009, p. 40).

A valuation analysis provides understanding on the financial profile of companies. It gives investors the ability to choose the appropriate valuation model upon which they can base their investment decisions. Financial analysis also provides useful information to complete valuation analysis. Fundamental analysis involves the assessment of a company's equity and performance to assess its relative attractiveness as an investment. Ratios should be useful in valuation analysis (Gibson, 2009, p. 464). Robinson et al. (2009, p. 303) stated that the end product of a valuation analysis is often a valuation and recommendation about investment, while theoretical valuation models are useful in selecting indicators that would be useful in this process. Moreover, the positive values of these indicators send out positive signals to all investors, creditors, and interested parties.

Market capitalisation "is the sum derived from the current stock price multiplied by the amount of shares outstanding" (Woo, 1981; Olson, 2005). Woo (1981) argued that because outstanding stocks are transacted in the secondary market, market capitalization could be used as a proxy for the public's valuation of a company's net worth and as a determinant in some stock valuation models. Capitalisation may be

compared to other economic indicators. According to O'Regan (2002), market capitalisation can be an indicator of a company's value, but it is only an ephemeral measure as it is based on the current stock market prices. The true value of the company is represented by its balance sheet, product positioning, and profits. Other variables may not reflect market capitalisation due to information asymmetry. In addition, Ologunde, Elumilade, & Saolu (2006) found that a company may have high profitability but low market capitalisation.

Olson (2005) classified market capitalisation into four main categories: 1) large-cap ($10-100 billion); 2) mid-cap ($1-10 billion); 3) small-cap ($100 million - 1 billion); and 4) micro-cap ($10-100 million). Nonetheless, he noted the absence of any clear-cut rules with regards to the currency value or percentile of the categories. Whatever the categorisation, nevertheless, it must be adjusted over time to account for economic factors that affect categorisation rules e.g. population change, inflation, and overall market value. This way, investors can make better investment decisions.

The identification of appropriate indicators will help investors to monitor changes in the market. Stock market indices are the commonly used indicators to monitor market performance and report changes in market capitalisation. Koller, Goedhart, & Wessels (2010, p. 337) defined stock market performance as a measure of returns over a period, in which stock returns are measured based on the portfolio of the manager, usually on a daily, weekly, monthly, and yearly basis. While there are various ways to measure stock market performance, the most common measure is market capitalisation. However, Table 3.2 shows some important market indicators along with their measurements and interpretations.

Table 3.2: Market Indicators

#	Ratio	Measurement	Interpretation
1	**Price to Earnings**	Price per share / Earnings per share	"How much an investor in common stock pays per dollar of current earnings"
2	**Market value added**	Price per share / Book value per share	"Market judgment about the relationship between a company's required rate of return and its actual rate of return"
3	**Earnings per Share**	Net income minus preferred dividends / Average outstanding common shares	"The amount of earnings attributable to each share of common stock"
4	**Dividend pay-out ratio**	Common share dividends / Net income attributable to common shares	"Percentage of earnings that the company pays out as to shareholders"
5	**Dividends per Share**	Common dividends declared / average outstanding common shares	"The amount of dividends to investors for each share of common stock"
6	**Market capitalisation**	Total current stock price * number of shares outstanding	"Market value of the company"

Source: Robinson et al. (2009, p. 303); Subramanyam and Wild (2009, p. 613); Gibson (2009, p. 342); Brealey, Myers & Allen (2011, p. 707).

In fundamental analysis, a set of techniques that contribute to the research framework in terms of accounting and market indicators was presented. The theoretical framework was constructed using accounting indicators, which represent the operational activities of the company, and market indicators, which represent the value of the company in the market. Accordingly, the fundamental analysis contributes to the building of the research model through the effects of accounting and market indicators on stock price and return and discriminant the firm performance. Additionally, the theoretical framework was constructed employing the volatility of stocks to achieve the research objectives. Nonetheless, the following section presents the contribution of the theoretical background to the proposed research framework.

3.5 Theoretical Background Contribution

A number of theories have been presented in this study. The study relied mainly on asset pricing theories in the financial markets. The asset pricing models were developed using stock price data. Thus, several models for asset pricing were developed. The current study used the Jensen's alpha model to evaluate firm performance using historical data. Three main variables emerged from these theories, namely stock price, stock return, and firm performance. Then, the fundamental and accounting analysis techniques were presented, resulting in accounting indicators, which reflect the company's operational activities (e.g., ROA, ROE, NPM, CR, DR, and TOA), and market indicators, which reflect the company's performance in the financial market (e.g., MC, STR, EPS, BPS, PER, and PBV). The theoretical framework provided a complete perception of the adopted variables to reflect the research problem. Specifically, the research problem lies in the importance of providing access to financial information to all investors at the lowest cost; providing financial analysis techniques to identify the factors that distinguish between performing and underperforming ASE constituents; and resolving the relationships between accounting and market indicators and firm performance through the mediating variable. Consequently, most important variables related to the company's internal and market performance were incorporated into the theoretical research framework. Thus, it enabled the verification of all relationships using the most important financial information that investors need in the financial market. Another part remains to support the theoretical framework, a review of past empirical studies. It is presented in the following sections.

3.6 Review of Past Empirical Studies

The main objective of this review is to survey extant research related to the present topic. It also helps to build knowledge in the field by identifying the important concepts, methods of research, and tested experimental techniques and how to apply them. The review of literature is one of the best ways to understand how results are presented and discussed in a scientific way. By reviewing research articles indexed in various relevant databases, it is possible to highlight the gaps in the literature and subsequently cover them with new research. Filling the research gap is the researcher's contribution to the development of knowledge (A. Alswalmeh & Dali, 2019a; WSU, 2017).

This section will present past empirical studies related to company performance and its determinants. The review revealed that the factors that influence company performance in those studies can be summarised to at least 10 dimensions. The systematic literature search was conducted in four databases. The search revealed numerous studies that have examined the performance of companies, assessed using a range of measures. Different authors used different methodologies and methods. Nevertheless, return on total assets was found to be the most common measure of performance. The researcher identified some gaps in research and variables that have not been examined by previous studies. This will be discussed in a later part of the chapter. Several important studies related to market volatility, the mediating variable of this study, were also identified. Lastly, this section will be summarised.

3.7 Systematic Literature Review of Company Performance

An extensive search for studies related to company performance was conducted in four databases, namely Scopus, ProQuest Central, Ebscohost, and Google Scholar. The search period was from 2008 to 2018. It was done by inputting a set of queries into

the search function of each database. Since the focus of this research mainly rests on company performance (the dependent variable), the researcher began with a comprehensive survey of previous studies that examined the variable to identify its main dimensions. Focus was specifically given to studies that used accounting and market indicators, which are the independent variables of this study.

Only articles that were published in the English language were included. In addition, the researcher excluded studies in the areas of political science, engineering, arts, and medical sciences, and restricted the search to studies in the fields of economics, finance, accounting, and administrative sciences. Nonetheless, some studies from other fields were included as they used accounting indicators to measure the performance of companies in some of their activities.

The general term "performance" was used as the search query. Next, "company's performance" was used to identify studies on company performance. The researcher paired the term accounting indicators and such sub-terms as profitability, credit (risk), valuation, and market capitalisation with "companies' performance" to cover all studies related to the current research subject.

In the first stage of the systematic literature review, a comprehensive survey was conducted on the four databases, returning voluminous quantity of articles. The researcher found that most of these studies only examined performance in general. The number of articles substantially declined when using the query "company's performance". The number further decreased when "companies' performance" was paired with the terms financial ratios, profitability, credit (risk), and valuation. However, no articles were found in all databases when the term "market capitalisation" was used along with "financial ratios" and "company's performance", suggesting that these variables are rarely, if any, examined together. The last term, "company's

performance", was the cut-off point, but there were some other important studies that were also reviewed. The researcher found about 2,401 articles related to the study. Table 3.3 is a summary of the systematic survey. The first column contains the queries used, while the other columns the number of articles in the databases.

Table 3.3: Systematic Search Result

Database: / ***keywords:***	***Scopus***	***ProQuest***	***EBSCOhost***	***Google scholar***
	# of Articles			
performance	85,356	45,073	31,786	310
Company's performance	12,915	6,125	654	94
Company's performance	1,564	509	273	55
Company's performance	347	21	13	27
Company's performance	39	5	2	5
Company's performance and financial ratios	11	8	7	5
Company's performance and profitability analysis	6	3	2	3
Company's performance and credit (risk) analysis	2	-	-	-
Company's performance and valuation analysis	1	-	3	1
Company's performance and market capitalisation	3	1	1	-
Company's performance and market capitalisation	-	-	-	-
Company's performance and stock volatility	90	57	41	23
Company's performance and stock volatility	16	11	7	4
Company's performance and stock volatility	3	-	3	4

Note: "-": means that no articles were found.

In the second stage, all articles were filtered to avoid duplication and to eliminate papers unrelated to the subject and field of study. This reduced the number of collected articles to 408. After a thorough reading of these articles, the researcher identified 108 articles to be used for the final analysis. Necessary articles are detailed in Appendix 1.

In the third stage, articles of similar subjects were grouped together and classified into dimensions. This classification was based on the nature of the variables used to examine company performance. There are numerous studies that used the variables related to the subject of the current study. The systematic survey resulted in ten dimensions of corporate performance. These dimensions, as well as the summary of all relevant studies, are discussed in the next subsection.

3.8 Empirical Studies on Company Performance

The systematic literature review produced several studies analysing and verifying the impacts of a number of variables on company performance. The researcher summarised these variables into ten dimensions: management, human resources, firm characteristics, supply chain, intellectual capital, technology, corporate governance, board of directors, financial analysis, and Z-score (MDA) (Figure 3.3). These studies employed a variety of methods, such as survey, multiple regression, and fundamental analysis.

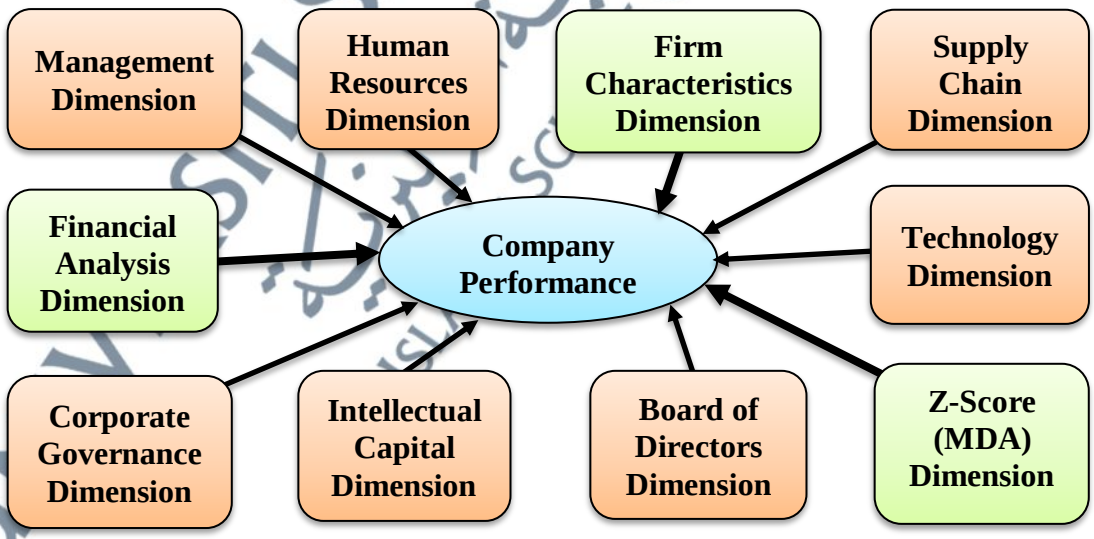


Figure 3.3: Dimensions of Company Performance

In the fourth stage, all variables under each dimension were examined in depth. The variables under the management dimension include strategic planning, investment decisions, mergers and acquisitions, and overall company structure. The human resources dimension include wages, employee loyalty, investment in training, and various HR practices. The supply chain dimension included such variables as product marketing, manufacturing and logistics services, while the intellectual capital dimension covered intellectual capital variables and their impact on the financial and administrative performance of the company.

The technology dimension encompassed ICT, databases, systems capabilities, and websites as its variables. The corporate governance dimension uses changes in ownership structure and compensation and incentives for managers and executives. The board of directors dimension uses the variables independence, quality, board structure, number of meetings, and demographic factors of the directors. All of the abovementioned variables were employed to assess company performance.

The current study focused on three main dimensions influencing company performance: firm characteristics, financial analysis, and z-score (MDA). A total of 57 articles were identified for this purpose (Figure 3.4). The studies, along with their variables and findings, will be presented and discussed in the next subsection.

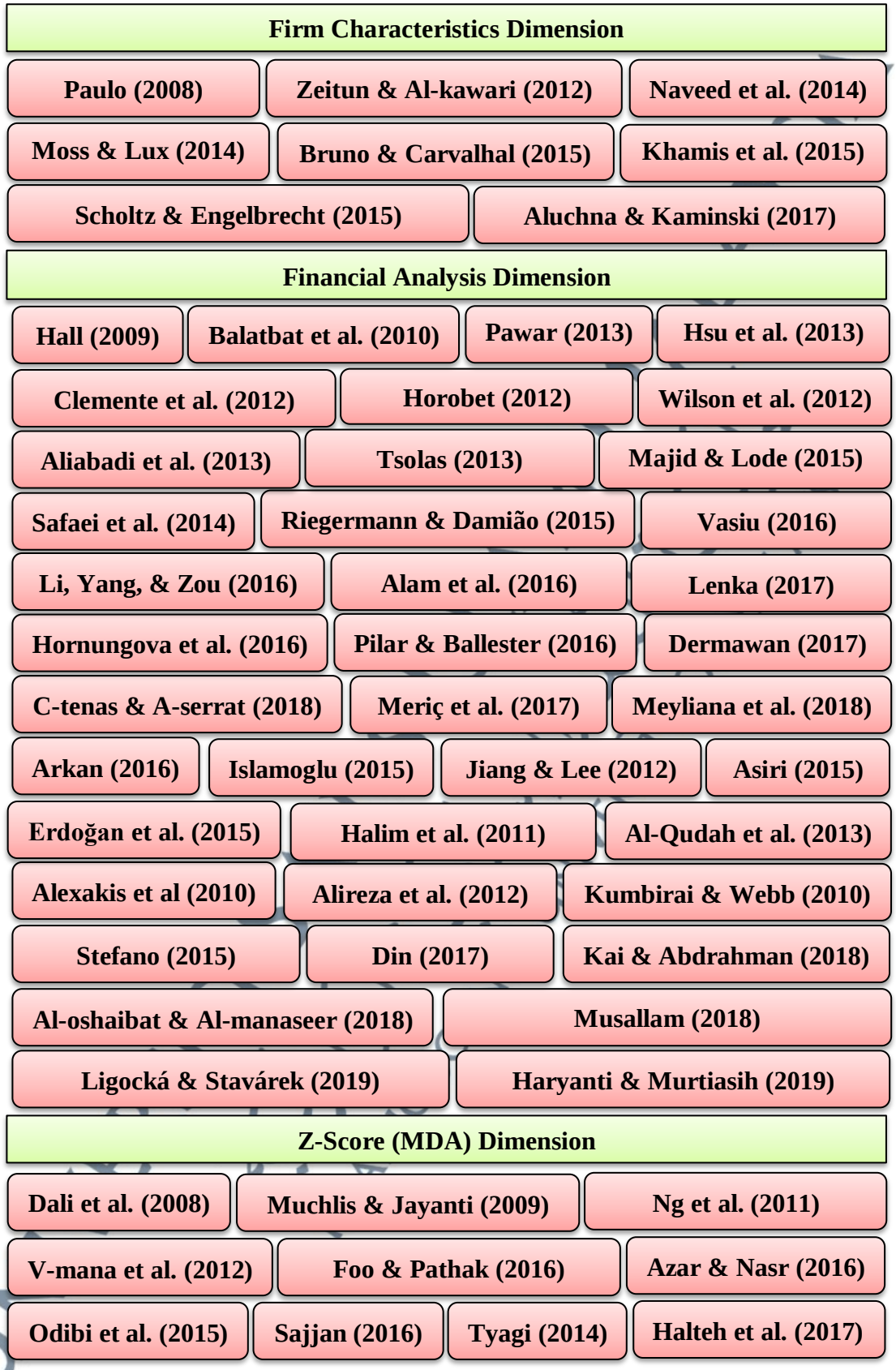


Figure 3.4: Three Dimensions Affecting Company Performance

3.8.1 Firm Characteristics

A significant volume of studies have used firm characteristics, such as firm performance on the basis of size, age, and type of ownership, to evaluate company performance. For example, Paulo (2008) examined the relationship between the size of Portuguese companies and their performance using dynamic panel analysis. The results showed that company performance was positively correlated with size, management, and ownership. Debt and the level of fixed assets had negative impacts on performance.

Zeitun and Al-Kawari (2012) investigated the impacts of state ownership, commercial risks, and financial leverage on company performance using panel data analysis. The sample was 191 companies from five Gulf Cooperation Council (GCC) countries (Qatar, Saudi Arabia, Oman, Bahrain, and Kuwait) for the period 1999-2006. They found that state ownership positively affected the performance and value of the sample companies, as measured by their ROA.

Examining another form of ownership, Naveed, Nadeem, Ahmad, & Hamad (2014) studied the impact of family ownership on the financial performance of Pakistani companies within the period of 2007 to 2011 using multiple regression analysis. The study found a positive and significant relationship between family ownership and financial and overall corporate performance. Khamis, Elali, & Hamdan (2015) found mixed results with regards to the effect ownership structures on financial performance, and that ROI was a better representation of financial performance compared to Tobin's Q. In contrast, Bruno & Carvalhal (2015) found no statistical relationship between controlling family and state ownerships and the performance of the companies in Brazil.

Scholtz & Engelbrecht (2015) measured the impact of institutional ownership on the performance of the top 100 companies listed on the Johannesburg Stock Exchange. Using regression analysis, the study found that institutional ownership was an important

determinant of a company's performance. Aluchna & Kaminski (2017) verified the relationship between the ownership structure and financial performance of 495 largest companies in Central Europe using multiple regression analysis. The study found a negative relationship between the ownership of majority shareholders and ROA, but a positive association between the ownership of industry investors and ROA. On the other hand, Moss & Lux (2014) tested the hypothesis that the valuation of European real estate securities is partly determined by the relative liquidity of the firms' shares. The sample comprised listed European and United Kingdom real estate companies during the 2002-2012 period. Modelling the depth and tightness of the market, the results showed that market capitalisation was the main variable driving the liquidity and valuations of the sample companies.

In the firm characteristics dimension, the indicators relating to firm performance included ownership, size, liquidity, and market value. The studies used a set of accounting and market indicators to measure the variables. Multiple regression analysis was prominent in past studies and different results were found in different study samples. This required further investigation into the relationship of these variables and firm performance. The current study adopted a set of variables whose relationships with performance are still inconclusive. In addition, some studies found no statistically significant relationships between financial leverage, capital structure, and firm performance, while other studies revealed positive statistically significant relationships between them. This is an important reason for including these variables, such as indicators of liquidity and firm market value, in the current study. The next section presents studies that have specifically investigated the relationships between accounting and market indicators and firm performance.

3.8.2 Financial Analysis

Studies under this dimension investigated the effects of such accounting and market indicators (or variables) as stock performance, economic performance, financial performance, efficiency, profitability, leverage, accounting indicators, earnings quality, and credit risk on company performance. For example, Hall (2009) investigated the impact of stock turnover (STR) on the stock performance of 20 US retail companies. The annual inventory turnover ratio was compared to the overall averages across the various industries in which these companies are located. The results showed that there were 80 annual turnover ratios and observed 80 changes in annual stock prices. Economic and financial performance have been studied by Wilson, Wright, Siegel, & Scholes (2012) which assessed the performance of private equity backed buyouts in the UK. Using multivariate regression models, the study found that buyout companies had 5-15% better productivity and about 3-5% higher profitability compared to non-buyout firms. The private-equity-backed firms experienced positive revenue and employment growth throughout the sample period. Riegermann & Damião (2015) analysed the relationships between economic, financial, debt performance, and market value measures of 57 Brazilian companies listed on the Sao Paulo capital market from 2001 to 2012. Using regression analysis, the study found that market value added (MVA) was the main explanatory variable for the market value of the companies.

The above studies examined a set of economic and financial indicators. The results suggest an important relationship between the indicators and firm performance. Some studies analyzed the effect of business activities on company performance using these indicators. To illustrate, Balatbat, Lin, & Carmichael (2010) compared the performance of building and or civil construction companies listed on the Australian Securities Exchange (ASE) to public blue chip firm and the Australian All Ordinaries

Index. The sample period was 1998-2007. Using fundamental analysis, the results showed that the performances of the sample companies were comparable to the benchmarks. Pawar (2013) analysed the financial performance of the largest public telecommunications service provider in India, BSNL, using various financial ratios on nine-year data (2002-2010). The study revealed that company had a strong liquidity position, reflecting its ability to repay short-term commitments on time.

Pilar & Ballester (2016) hypothesised that adopting sustainable energy systems could improve financial performance. Based on a sample of 574 companies from 36 countries in 2008-2013, analysed with the dynamic system panel regression, the study revealed that the adoption of sustainable energy systems allowed companies to improve their financial performance in the short term. Creixans-tenas & Arimany-serrat (2018) analysed the economic and financial performance of hospitals in Spain in 2008-2015 and investigated the determinants of their profitability. Using Pearson's product-moment correlation, the results showed that liquidity and debt significantly affected the hospitals' profitability. The sample also exhibited good financial management, through its management of assets needs to be improved.

The studies have shown the importance of the indicators to explain firm performance. A set of economic, financial, and accounting indicators were used. The indicators significantly affected firm performance. These results support the theoretical framework of the current study. In addition, the studies have employed fundamental analysis techniques. Therefore, they support the theories and accounting analysis techniques employed in the current study. Using accounting analysis techniques, accounting and market indicators were identified.

Accounting and market indicators were used in most financial analysis studies. For example, Clemente, Taffarel, & Silva (2012) analysed the ability of financial ratios

to interpret short-term fluctuations in the prices of ordinary shares of 24 companies in the Sao-Paulo securities market from 1998 to 2008. Daily closing prices data were regressed on 16 financial ratios. The study found that accounting indicators (i.e. ROA, DR, CR, and TOA) significantly explained the short-term price fluctuations of Brazilian common stocks and confirmed that accounting reports are an important source of information in the market. Safaei Ghadikolaei, Khalili Esbouei, & Antucheviciene (2014) constructed a hierarchical financial performance evaluation model using accounting and economic value indicators for companies listed on the Tehran Stock Exchange. They concluded that economic value measures (i.e. EVA, CVA, and MVA) provided more useful financial performance information than accounting measures (i.e. OPG, ROE, and ROA). In contrast, Alam, Alam, & Khan (2016) found no statistically significant correlation between the ROE of the Group and its competitors, but its profitability was relatively better than them.

Hornungová, Jana & Milichovský (2016) analysed the relationships between financial indicators and the performances of Czech agricultural companies. By carrying out factor and correlation analyses, the indicators were summarised into three indices: operational, profit, and return. The study showed that all indices were significantly associated with performance, but the strongest was the operational index. This result differed of Vasiu (2016) study, which indicates that a strong correlation between the constituent firms' EPS and the BET-NG index, but a weak correlation between their ROA and ROE and the Index.

The findings of previous studies support the importance of accounting and market indicators to explain stock prices and firm performance. The differences in the strength of the relationships between the indicators suggest that the relationships still require further investigation. The studies contributed to building the variables of the current

study by using accounting and market indicators (e.g., ROA, ROE, DR, CR, TOA, MVA, and EPS).

Using accounting and market indicators, some researchers also compared the ability of different models to analyse company performance. For example, Burja (2011) used four regression models to analyse the factors influencing the performance of Romanian companies. The study found a strong relationship between the effective management of available resources and firm performance. Li, Yang, & Zou (2016) evaluated the credit risk of listed companies in China using the Zero-Price Probability (ZPP) and the Kealhofer-McQuown-Vasicek (KMV) models, comparing the estimations of both. The sample consisted of 34 financially distressed companies and 34 financially healthy firms. Using a number of statistical tests and descriptive statistics, the results showed that the discriminatory power of the ZPP model was superior to that of the KMV model; the former was able to better distinguish financially healthy and distressed firms.

Hsu, Ou, & Ou (2014) developed a model to estimate the sustainability performance of firms. They first compiled the criteria to evaluate sustainability performance by integrating the measures of financial, credit risk, and social and environmental responsibilities. A new model was then constructed to assess the performance sustainability of the firms. The model was tested on 30 listed Taiwanese high-tech companies. The results showed that the model was able to estimate the performance of those companies and rank them according to their sustainability performance. These estimations may help investors and fund managers to ensure that their investments are profitable and sustainable.

Financial and market performance measures were also examined in most studies using accounting and market indicators. Aliabadi, Dorestani, & Balsara (2013)

examined the associations between both market performance (i.e. share price, return per share) and accounting performance measures (i.e. sales and ROA) for US and non-US firms that implement the International Financial Reporting Standards (IFRS). The regression analysis concluded that there was a positive relationship between the market performance and accounting performance measures, and the most relevant accounting indicator was ROA.

The studies focused on certain indicators. The current study supported past studies by adopting additional indicators that reflect the operational activities of the company and its performance in the market. However, some studies also focused on leverage and profitability indicators. Horobet (2012) studied the dynamic trade-off between efficiency, profitability, and financial leverage for Romanian companies listed on the Bucharest Stock Exchange. The study found that the performances of the companies fluctuated significantly from year to year, and that with the exception of PER and EPS, the performance of companies in the stock market was not explained by their operational and financial performance. Using data envelopment analysis (DEA), Tsolas (2013) evaluated the impact of profitability efficiency on the performance of 19 construction companies listed on the Athens Stock Exchange. The results revealed no positive relationship between profitability efficiency and the performance of the companies. In addition, Lenka (2017) investigated the impact of leverage on the profitability of Czech companies from 14 sectors using regression analysis. The study found that leverage (i.e. debt ratio) had a significantly negative impact on profitability.

The market capitalization indicator has received little attention in the literature. In some studies, it was used to analyze firm performance. Majid & Lode (2015) measured the extent to which the decline of a company's market capitalisation below the book value of its net assets would be an appropriate proxy to indicate the impairment

of goodwill. They found that examined independently, the decline in market capitalisation was not a good indicator of goodwill impairment. But the contrary was found when the indicator was associated with the performance of the company and its segment. Dermawan (2017) analysed the associations between operating profit and other comprehensive income and market capitalisation using a sample of the top 50 companies on the Indonesian Stock Exchange from 2010 to 2014. Using Spearman's rho, the results revealed a significant positive correlation between operating profit and market capitalisation, but no significant correlation between other comprehensive income and market capitalisation. The current study employs the market capitalisation to solve this inconclusive relationship using a mediator variable. This investigation will contribute the using accounting and market indicators adopted in this study.

The power of accounting and market indicators has also investigated towards stock prices. Meriç et al. (2017) studied the association between the stock prices and financial ratios of five Turkish banks in 2008-2017 using monthly prices, price-earnings ratio, and dividend yield ratio. They found that the magnitude and direction of the relationships varied from a bank to another. Likewise, Arkan (2016) examined the ability of financial ratios to predict future stock price trends. The author employed 12 financial ratios and used the 10-year data of 15 Kuwaiti-listed companies from three different sectors. He concluded that some ratios were able to significantly predict future stock price trends and behaviours. Two similar studies by Islamoglu (2015) and Alswalmeh & Dali (2019b) investigated the ability of financial ratios to predict the Turkish and Jordanian banking sector indexes using multiple regression analysis. Both studies found that some financial ratios were able to predict the changes in those indexes. The studies proved the predictive power of accounting and market indicators on performance or other variables, but it may vary over time.

To determine the relationships between profitability, liquidity, efficiency, and financial performance ratios and firm's market value, Asiri (2015) used a sample of 65 UK companies constituting the Financial Times Stock Exchange 100 (FTSE 100) from 2000 to 2013. The ratios were found to be significantly correlated to market value. Erdoğan, Erdoğan, & Ömürbek (2015) regressed the financial performance of nine firms listed on the Istanbul Stock Exchange on four financial ratios. They concluded that liquidity ratio and company size significantly explained financial performance. On the other hand, debt level negatively affected financial performance.

Al-Qudah, Alsharari, Al-Rjoub, & Haddad (2013) argued the possibility of using financial indicators to predict share prices. Likewise, Alswalmeh & Dali (2020a) and Alswalmeh & Qaqish (2021) used it to predict banking sector index in Jordan. Jiang & Lee (2012) confirmed that decomposed financial ratios, including earnings-price ratio and book-to-market value, could predict excess returns and fundamentals in the short- and long-term. Their findings were based on the regression of historical returns and fundamentals of the S&P 500 from 1926 to 2008 on conventional and decomposed ratios.

Accounting and market indicators appear to have the power to predict insolvency. Alireza et al. (2012) collected data from 100 companies for 2003-2007 to test this hypothesis. They found that financial ratios could significantly capture signals of financial trouble or bankruptcy sent by companies. Using financial ratios, Halim, Jaafar, & Osman (2011) were able to assess the financial health of six large and medium Malaysian construction firms. They found that most of these companies were facing financial trouble, and that they had inadequate cash capital to finance their projects.

Alexakis, Patra, & Poshakwale (2010) investigated the ability of financial ratios to predict stock returns using data from 74 companies listed on the Athens Stock

Exchange in 1993-2006. Similar to the above studies, they confirmed that financial ratios could predict market returns; in fact, portfolios selected on the basis of financial ratios would generate higher than average returns. This also confirmed by Kumbirai & Webb (2010) and Al-oshaibat & Al-manaseer (2018), which revealed that the ratios were able to strongly predict the prices.

Recently, Ligocká & Stavárek (2019) examined the associations between certain accounting and market indicators and the stock prices of food companies listed on selected European Stock Exchanges. They analysed the annual time series data using the generalised method of moments (GMM) estimator. The findings revealed that the determinants of stock prices varied by country: Austrian firms were mainly influenced by ROE, whereas Polish companies by ROE, return on capital employed (ROCE), and net working capital (NWC). This motives the current study to do further investigations. However, the stock prices of Swiss companies, meanwhile, were not affected by any of the ratios. The strength and directions of the relationships between the variables likely differ by sector and country. This supported the argument that the accounting and market indicators may vary over countries. It's also confirmed by Meyliana, Bunyamin, & Agustina (2018) study, which found no relation between the performance of the companies and country risk of each other. In contrast, Haryanti & Murtiasih (2019) studied the effects of such accounting and market indicators as debt-to-equity (D/E), ROA, dividend payout ratio (DPR), and EPS on stock price. The empirical exercise focused on Indonesian-listed banks in 2018-2019 and found that stock price was influenced by DER, ROA, and EPS, but not DPR.

The above previous studies have contributed to the theoretical framework and identified the explanatory variables. Results varied across period and sample. The current study adopted a set of accounting and market indicators to explain their

relationships with stock price, return, and performance. The investigation of these relationships will contribute to empirical knowledge.

Towards stock return, Kai & Abdrahman (2018) evaluated the correlations between EPS, ROE, and DPS growth and the stock returns of 31 Malaysian-listed financial companies, covering a sample period of 2011-2016. Following a Pearson's correlation analysis, the research discovered that EPS growth and stock returns were significantly correlated in five firms; ROE growth and stock returns in another five; and DPS growth and stock returns in another six. Musallam (2018) also attempted to determine the impacts of financial ratios on stock returns, though the sample was 26 Qatari-listed firms from 2009 to 2015. The results of the weighted least squares (WLS) regression showed that EPS, earnings yield ratio, and dividend yield ratio were positive determinants of stock returns, while market-to-book-value ratio, ROA, ROE, price-to-earnings ratio (P/E), dividends earnings ratio, and net profit margin did not significantly predict stock returns. In addition, Din (2017) investigated the predictability of stock returns by regressing them on selected financial ratios. The sample was 65 constituents of the PSX 100 Index from 2001 to 2014. Results of the OLS regression revealed that debt ratio, return on sales, firm size, market return, and Tobin's Q were significantly and positively associated with stock returns. But the asset turnover ratio, EPS, inflation, interest rate, and GDP had opposite results. Stefano (2015) investigated whether the effects of financial ratios on the stock returns of the property industry are significant. The data were collected from 18 property companies listed on the Indonesian Stock Exchange. Analysed using multiple linear regression, the result showed that the overall model was significant, but only ROA had a significant impact on stock returns.

In the financial analysis dimension, a set of economic, accounting, and market indicators were used to verify firm performance. Firm performance is proxied using

numerous measures. Stock price and return are the most prominent measures used by studies in this dimension. Their results support the development of the conceptual framework of the current study.

Economic indicators (e.g., GDP and EVA) are linked more to countries' economic standards and investment policies. On the other hand, financial, accounting, and market indicators (e.g., ROA, ROE, CR, DR, EPS, MC, STR, MBV, and MVA) are linked to stock price and return. Studies have shown that accounting reports are an important source of financial information. Therefore, the current study focused its attention on accounting and market indicators to explain firm performance.

To investigate the performance of companies' operational activities in the market, the study used accounting and market indicators calculated from the financial statements using fundamental analysis. These indicators reflect firm profitability, efficiency, financial leverage, credit risk and their relationships towards firm performance, stock price, and stock return. Therefore, the financial analysis dimension supports the proposed conceptual framework of the study in two ways. First, explaining the main accounting and market indicators that will be developed. Second, explaining the importance of investigating the effects of accounting and market indicators on stock price and return.

The accounting and market indicators were then used to discriminate between performing and underperforming companies using the Z-score model (MDA). The following section discusses empirical studies that employed Z-score models (MDA) using accounting and market indicators.

3.8.3 Z-Score (MDA)

The Z-Score (MDA) dimension is frequently used to evaluate companies' performance. Studies under this dimension employed MDA to distinguish between companies: good or bad, insolvent or solvent, over- or underperforming, and so on. For example, Halteh, Kumar, Gepp, & Gepp (2017) attempted to predict financial distress in 101 publicly listed Islamic banks using cutting-edge stochastic models. A total of 18 accounting ratios were included in the Altman Z-score and Altman Z-score for services models. The ratios were then ranked by importance. According to both models, the working capital per total assets ratio was the most important variable for predicting financial distress in Islamic banks.

Azar & Nasr (2016) examined whether the solvency and insolvency of Lebanon SMEs can be predicted using the Altman Z-score model, financial ratios, and binary logistic regression. The study concluded that Altman Z-scores had modest accuracy, as they were able to reasonably predict solvent SMEs but not insolvent ones. Sajjan (2016) estimated the likelihood of bankruptcy of manufacturing and non-manufacturing firms listed on the Bombay and National (Indian) Stock Exchanges from 2011 to 2015. The predictions were made using Altman's Z-score. The study found that three companies were financially distressed. Other companies were in the grey zone in 2012, but in the succeeding years moved to the distress zone. Some were initially distressed but were then showing signs of improvement in the subsequent years.

Foo & Pathak (2016) assessed the relationship between financial health and the performance of manufacturing companies listed in the Chinese and Indian financial markets from 2000 to 2013. The Altman Z-score was used to measure financial health, while ROE was used as a measure of company performance. There was a statistically significant and positive correlation between Z-Score and ROE for both markets. Odibi,

Basit, & Hassan (2015) examined whether Altman's Z-score correctly predicts bankruptcy on a sample of 17 healthy and 17 distressed Malaysian-listed manufacturing companies from 2010 to 2014. The study revealed that not all failing companies were classified as Practice Note 17 (PN17) firms, the status attributed by Bursa Malaysia to financially distressed firms. Four out of five financial ratios in the Z-score model significantly predicted company failure. Meanwhile, Tyagi (2014) measured the financial performance and the efficiency of the financial operations of Indian logistics companies from 2005 to 2011. Using the Z-score model, the study revealed that the sample of the study was largely healthy. The average value of the sample ranged between 1.82 and 3.39, and the overall performance of the industry was satisfactory.

Venkataramana, Azash, & Ramakrishnaiah (2012) predicted the risk of bankruptcy of cement companies in India from 2011 to 2010 using a set of financial ratios and Altman's Z-score. The study found that liquidity, working capital, and the solvency of companies were not satisfactory, and that some companies suffered from poor financial performance and were approaching bankruptcy. Ng, Wong, & Zhang (2011) developed a Z-score model to distinguish solvent and insolvent construction companies in China. The determinants of the model were seven financial ratios. The study found that the current asset to turnover ratio and working capital to total asset ratio had the highest discriminatory capacity. Two profitability indicators, namely total profit to turnover and ROA, were also necessary for the long-term solvency of companies. Muchlis & Jayanti (2009) discriminated insolvent and solvent companies from a sample of 19 Indonesian-listed property firms from 2004 to 2008 using Altman's model. They found that two companies were healthy but one was insolvent.

The studies above distinguished between companies that are likely or unlikely to be bankrupt, whereas the research reviewed here attempted to discriminate between

performing and non-performing companies. Mohd Dali et al. (2008) identified performing and non-performing Shariah-compliant companies by first using Jensen's alpha, before applying the results and 20 financial ratios to MDA. The results concluded that the inventory turnover and credit turnover/day ratios could distinguish between performing and non-performing Shariah compliant plantation companies. The study recommended the application of the model to different sectors.

In Z-score (MDA) dimension, discussions on the accounting and market indicators that may be useful in evaluating the risk of bankruptcy have on going for a long time. Beaver (1966) suggested six ratios that can predict company failure: cash flow to total debt, ROA, total debt to total assets, working capital to total assets, current ratio, and no-credit interval. Altman (1968) and Altman, Haldeman, & Narayanan (1977) put forward a model of financial ratios that can effectively forecast bankruptcy. Similar researches have been carried out to predict bond ratings and yields. Ederington, Yawitz, & Roberts (1987) found some ratios were able to explain bond yields. Ederington (1986) further found ratios to be effective in evaluating a company's bond ratings. The current study employed accounting and market indicators to build an effective model to discriminate performing and underperforming companies, a subject that has received little attention in the literature. It followed the methods and conclusions of Mohd Dali et al. (2008), that inventory turnover and credit turnover/day ratios could discriminate between performing and non-performing Shariah compliant companies in the plantation industry.

The review of firm performance theories and financial analysis techniques contributed to developing the relationships between accounting and market indicators and stock price, stock return, and performance. In addition, the current study employed price and return volatility as a mediator on the relationship between the explanatory

variables and stock price and return. Stock volatility was expected to improve the relationships between the variables. To support the construction of the theoretical framework, the empirical studies on volatility are discussed in the following section.

3.9 Empirical Studies on Volatility

Markowitz's seminal work (1952) on the basic portfolio theory posits a linear risk-return relationship, providing a useful model for portfolio and asset management, as well as assets and derivatives valuation. Uncovering the risk-return relationship offers a deeper understanding of market dynamics and can serve as a reference for the development of new asset pricing models. In addition, Black (1976) and Christie (1982) studied the risk-return relationship and found that the declining stock prices of individual companies would increase their financial leverage, increasing the equity's volatility.

At the firm-level, Cheung & Ng (1992) found evidence for the inverse relationship between volatility and stock returns. While the nature of the relations between firm size and stock price dynamics is stable, their strengths appear to change over time. Following a similar research, Duffee (1995) concluded that the statistical relation was primarily due to "a favourable contemporaneous relation between firm stock returns and firm stock return volatility". Small firms and those with little financial leverage exhibited the strongest positive relation.

Stock volatility has seemingly become a subject of growing interest among academics, policy makers, and practitioners since the past two decades. Policy makers and participants of the financial market perhaps place much concern on the subject because it can be used as a measure of risk. Investors may be discouraged from participating in the financial market if stock returns are highly volatile, especially due

to the inherent uncertainty associated with the attribute (Miah & Rahman, 2016). Based on their survey, Graham & Harvey (2001) showed that risk is carefully considered in investment decisions. Therefore, the volatility of stock price and return, which reflects distress risk, should naturally affect financial decision. Unfortunately, little attention has been given to examine the effects of stock volatility and fundamental analysis on stock price and return, even though both sets of variables are fundamental determinants of stock performance.

The systematic search process shown in Table 3.3 has identified 10 studies on stock volatility, company performance, and fundamental analysis of performance. They were found by using the query "companies' performance and volatility", which was the cut-off point. Figure 3.5 lists some empirical studies that have measured stock volatility and compared it to other financial markets or examined its relationships with many fundamental variables related to company performance. They will be reviewed below.

Aljarayesh et al. (2018) examined the relationship between stock return volatility and performance of the Amman Stock Exchange. The results of the generalised autoregressive conditional heteroskedasticity (GARCH) model indicated that the ASE displayed strong volatility persistence, and that past volatility was able to explain current volatility. Gautam (2017) found that leverage, market capitalisation, dividend payout, and dividend yield had positive impacts on stock returns. Conversely, book-to-market ratio, growth of assets, and earning price ratio had negative relations with stock returns. Share price volatility was positively determined by leverage, dividend payout, and dividend yield, but negatively affected by market capitalisation, book-to-market ratio, growth of assets, and earning price ratio. These results supported the findings of Handayani et al. (2015), which showed that stock price volatility was positively explained by ROE, CR, DER, DPR, company size, and sales growth.

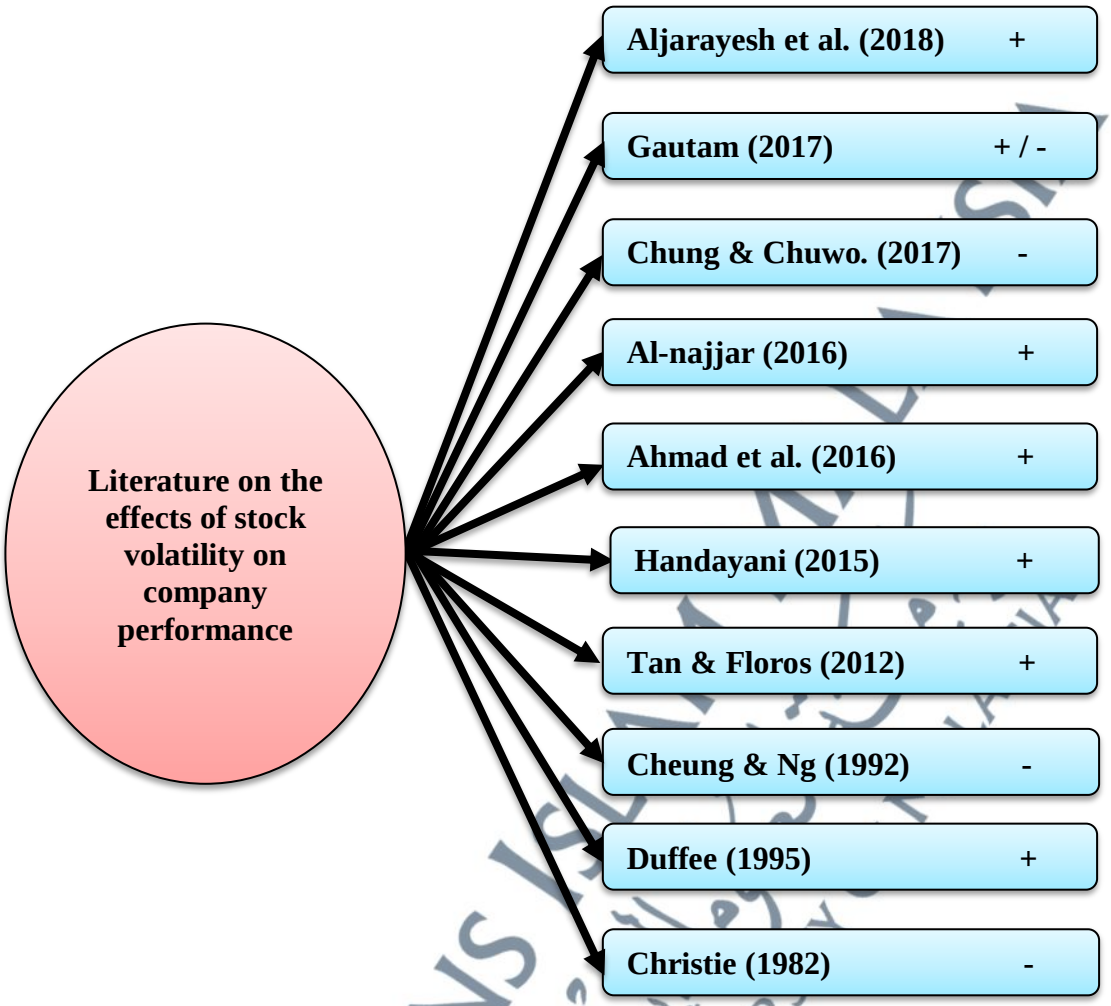


Figure 3.5: Empirical Studies on the Effects of Volatility

Market volatility had an inverse relation with stock returns, as found in the NASDAQ stock market. The unexpected changes in market volatility had a significant negative impact on stock return due to the higher illiquidity premium. The behaviour of stock returns on the ASE could capture the characteristics of the market. In addition, the high level of volatility of the Chinese stock market positively affected the performance of companies and could generate higher ROE (Al-Najjar, 2016; Chung & Chuwonganant, 2017; Tan & Floros, 2012). Furthermore, Ahmad et al. (2016), applying GARCH family models, established the significant causal relation of volatility on stock returns.

The mediating role of stock volatility stems from investors' decisions to invest in the financial market. Investors' decisions are mainly related to changes in stock prices and returns. Markowitz (1952) argued that there is a linear relationship between risk and return. In addition, studies revealed that the relationship direction between stock price and return may vary over time. Cheung and Ng (1992) found a negative relationship between volatility and stock return, but the strength of the relationship changes over time. Duffee (1995) found a significant positive relationship between volatility and stock return. If stock price and return are highly volatile, investors may forego investing in the market due to the uncertain condition. On the other hand, investors' decisions are mainly related to the accounting and market indicators that relate to firms' activities. Studies have confirmed a strong relationship between the indicators and firm performance. Investors focus their attention on stock volatility to improve investment decisions. In addition, they focus on accounting and market indicators. These interests motivate the current study to investigate these concerns. Accounting and market indicators reflect the company's internal activities. The company's stock price and return reflect the performance of company in the market. Stock volatility seems to play an important mediating role between these relationships. It mediates the relationships between them and reinforces investment decisions.

Finally, in all of the reviewed studies, it is noted that the results demonstrated the importance of volatility in the interpretation of price and return. Likewise, volatility is linked to many variables of fundamental analysis. Establishing an intermediate relationship between both variables, in this case volatility, will support these studies and may broaden the scope of its application in the measurement of company performance. Therefore, the explanatory variables, hypotheses, and proposed research framework will be developed in the following sections.

3.10 Explanatory Variables Development

The studies discussed in the previous three dimensions revealed different relationship directions between the indicators and firm performance. The studies confirm that accounting and market indicators are important tools in the financial market. It can explain changes in stock prices and returns (Islamoglu, 2015). Liquidity indicator, such as LR and firm size, greatly explains financial performance, but it varies by period and sample. On the other hand, level of debt (DR) adversely affects financial performance. The association of EPS has been confirmed by several studies. This is due to the difference in the samples and the different activities of the sectors in the market.

Regarding the explanatory variables of this study, the studies have shown that the correlations between stock price and return and some indicators (i.e., EPS and ROA) are positive and statistically significant. Other studies showed that ROA and ROE are poorly linked to firm performance. This was supported by studies that showed no positive relationship between profitability efficiency and firm performance. In addition, credit risk variables such as CR were also examined in several studies. Some studies found strong relationships between credit risk variables and firm performance, while other studies found no correlation. Surprisingly, numerous studies revealed the positive correlation between leverage (DR) and firm performance studies, but others found that it has a significant negative impact on performance. At the same time, Majid and Lode (2015) revealed that the decline in market capitalization (MC) is not a good indicator of the weak performance of companies in the market. In addition, Dermawan (2017) revealed that there is no significant correlation between operating income and market capitalization (MC). These results confirmed that the relationship is inconclusive, and further investigation is necessary. Therefore, the current study attempted to obtain more conclusive evidence for these relationships.

Recently, several studies have examined the relationships between accounting and market indicators and stock prices and returns. Jiang and Lee (2012) argued that price-earnings ratio (PER) and book-to-market value (PBV) could predict excess returns in the short and long term, but they differed at times. Al-Oshaibat and Al-Manaseer (2018) concluded that accounting and market indicators are able to predict the current prices data, but they may differ when applied to previous data. This finding was supported by Haryanti and Murtiasih (2019), who indicated that stock price is affected by DR, ROA, and EPS. Kai and Abdrahman (2018) showed that market-to-book (BPS), return on assets (ROA), and earning per share (EPS) do not significantly predict stock returns. In addition, Meriç et al. (2017) suggested that accounting and market indicators require further investigation because the direction of their relationships varies from one sector to another. Furthermore, some indicators are able to significantly predict future trends and behaviors of stock prices, but the relationship of some indicators with stock price is still inconclusive (Arkan, 2016).

Accordingly, the current study included the explanatory variables that showed inconclusive relationships with stock price and return. In addition, due to sample conditions, all combination of common indicators between the sample companies were selected and classified into accounting indicators. Accounting indicators reflect the company's operational activities (i.e., ROA, ROE, NPM, CR, DR, and TOA). Market indicators reflect the company's performance in the financial market (i.e., MC, STR, EPS, BPS, PER, and PBV).

On the other hand, the reviewed studies showed that some indicators were used as control variables, such as firm size, liquidity, debt ratio, leverage ratio, and coverage ratio. The study did not use control variables for several reasons. First, the current study used accounting and market indicators which may be extracted from the same values in

the financial statements. The use of control variables may result in multicollinearity. Second, each indicator was tested to scrutinize the relationships between the variables without influencing or controlling other factors. Third, the study employed multiple discriminant analysis (MDA). Following the assumptions of MDA, control variables cannot be included. Fourth, the current study investigated the effect of the mediator on the relationship of each indicator with the stock price and return. The singular analysis of the indicator in this relationship provided evidence for the relationships independent from other effects. Therefore, control variables were excluded. However, most studies confirmed that stock prices and returns fluctuate significantly across time and sector. The relationship directions of accounting and market indicators towards stock prices and returns are still inconclusive and require further investigation. In the meantime, this conclusion encourages the construction of a conceptual framework that includes a mediator that can help explain this relationship better. This variable may improve the direction of relationships, support previous results, and realize the study objectives.

3.11 Hypotheses Development

Hypothesis development is the formulation of "a logically conjectured relationship between two or more variables expressed in the form of a testable statement" (Sekaran, 2003, p. 103). The outcome of a hypothesis testing offers some clues as to what could be changed or improved to solve the research problem (Alswalmeh & Dali, 2020b). The current study investigates the effects of accounting and market indicators on company performance. The relationships between these indicators and company performance were specified based on the three identified dimensions that influence firm performance (i.e., firm characteristics, financial analysis, and Z-score). Accordingly, the hypotheses of the study were formulated.

Clemente, Taffarel, and Silva (2012) showed that accounting and market indicators had significant impacts on stock performance and confirmed that accounting analysis is an important source of information. Hall (2009) found that the annual turnover ratio (STR) predicted changes in stock price and return. Moreover, the use of accounting and market indicators could improve company performance (Balatbat, Lin, & Carmichael, 2010; Rani, Yadav, & Jain, 2015).

Profitability indicates the ability of companies to generate profit from their business activities and by exploiting all available resources (Brealry et al., 2011, p. 711). Horobet (2012) found that operational profitability had a significant impact on company performance. Wilson et al. (2012) showed that revenue growth positively affected company performance. Ally (2013) found significant differences between banks when their performance was measured with ROE. Mubin, Lal, & Hussain (2014) and Delen, Kuzey, & Uyar (2013) found profit margin and asset utilization indicators significantly predicted company performance. Similarly, Hornungová, Jana, & Milichovský (2016) concluded that operational indicators had strong relationships with companies' performance.

Credit risk relates to liquidity, capital structure, and solvency. Liquidity indicates the ability of a company to meet short-term obligations, while solvency to meet long-term debts. Capital structure refers to the financing sources of a company (Subramanyam & Wild, 2009, p. 36). Paulo (2008) and Erdoğan et al. (2015) found significant relationships between liquidity ratio (CR), debt ratio (DR), and financial performance. Pawar (2013) found that the liquidity position of a company reflected its ability to pay short-term commitments. Lenka (2017) revealed that debt ratio had a significant impact on company performance. In addition, Creixans-tenas and Arimany-

serrat (2018) concluded that acceptable levels of liquidity and indebtedness significantly affected company performance.

The main objective of valuation indicators is to estimate the intrinsic value of company stock (Subramanyam & Wild, 2009, p. 36). Jiang and Lee (2012) found that EPS and market-to-book-value ratio significantly predicted company performance. Aliabadi et al. (2013) found a strong relationship between valuation analysis and company performance. Vasiu (2016) showed a strong correlation between EPS and stock index. In addition, Arkan (2016) concluded that EPS and market-to-book-value ratio had significant, positive relationships with stock price trends. In an analysis of market capitalisation, Subeniotis et al. (2011) summarised that stocks were positively correlated with market capitalisation (MC). Horobet (2012) showed that bigger companies had higher profitability and EPS than smaller firms, suggesting that market capitalisation could affect firm performance. AlOmoush & AL-Shubiri (2013) showed that ROA and ROE have a significant relationship with stock returns. Majid and Lode (2015) concluded that market capitalisation may be associated with stock return. Recently, Allozi and Obeidat (2016) found that ROA, ROE, and EPS positively affected stock returns. Susilawati and Suryaningsih (2020) revealed that ROE, EPS, and MC also positively affected stock prices. Based on the above discussions, a hypotheses 1 was formulated:

H_1: Accounting and market indicators significantly predict stock price and stock return.

Several studies have employed various financial indicators to discriminate company performance into groups. Azar and Nasr (2016) classified company performance into performing and non-performing loans; Venkataramana, Azash, & Ramakrishnaiah (2012) into bankrupt and non-bankrupt; and Odibi, Basit, and Hassan

(2015) into failure and non-failure. Using Altman's Z-score, Foo and Pathak (2016) and Tyagi (2014) measured financial health, while Halteh, Kumar, Gepp, and Gepp (2017) predicted financial distress. Ng, Wong, and Zhang (2011) developed a quantitative model based on financial indicators to distinguish solvent and insolvent companies, whereas Muchlis and Jayanti (2009) identified bankrupt and non-bankrupt companies. Using Jensen's alpha model and financial ratios, Mohd Dali et al. (2008) discriminated plantation companies to performing and non-performing. A hypotheses 2 was developed based on these results:

H_2: There are significant differences between performing and underperforming companies.

Risk is an important consideration in investment decisions. Graham and Harvey (2001) showed that the volatility of stock price and return naturally affected financial decisions. Gautam (2017) concluded that leverage, dividend payout, and dividend yield were positively associated with share price volatility. However, market capitalisation, book-to-market ratio, asset growth, and E/P ratio had opposite effects. Handayani et al. (2015) showed that stock price volatility was positively explained by ROE, CR, DER, DPR, company size, and sales growth. Bateni & Asghari (2014) found a significant relationship between P/E ratio and market price deviations. Li, Yang, & Hsiao (2005) found evidence of a significant negative relationship between expected returns and volatility in six markets. McKee (1987) examined the mediating effect of volatility on the relationship between marketing effort and organisational performance. Market volatility negatively affected the relationships of certain variables but positively influenced others. Nevertheless, several studies showed inconclusive relationships between accounting and market indicators and stock prices and returns. Jiang and Lee (2012) argued that price-earnings ratio (PER) and book-to-market value (PBV) could

predict excess returns in the short and long term, but they differed at times. Recently, Al-Oshaibat and Al-Manaseer (2018) concluded that accounting and market indicators are able to predict the current prices data, but they may differ when applied to previous data. This finding was supported by Haryanti and Murtiasih (2019), who indicated that stock price is affected by DR, ROA, and EPS. Kai and Abdrahman (2018) showed that market-to-book (BPS), return on assets (ROA), and earning per share (EPS) do not significantly predict stock returns. In addition, Meriç et al. (2017) suggested that accounting and market indicators require further investigation because the direction of their relationships varies from one sector to another. Furthermore, some indicators are able to significantly predict future trends and behaviors of stock prices, but the relationship of some indicators with stock price is still inconclusive (Arkan, 2016). Thus, a hypotheses 3 was formulated from these conclusions:

H_3: Stock price and return volatility mediates the relationships between accounting and market indicators and stock price and return.

The hypothesis H_3 was divided into 24 sub-hypotheses:

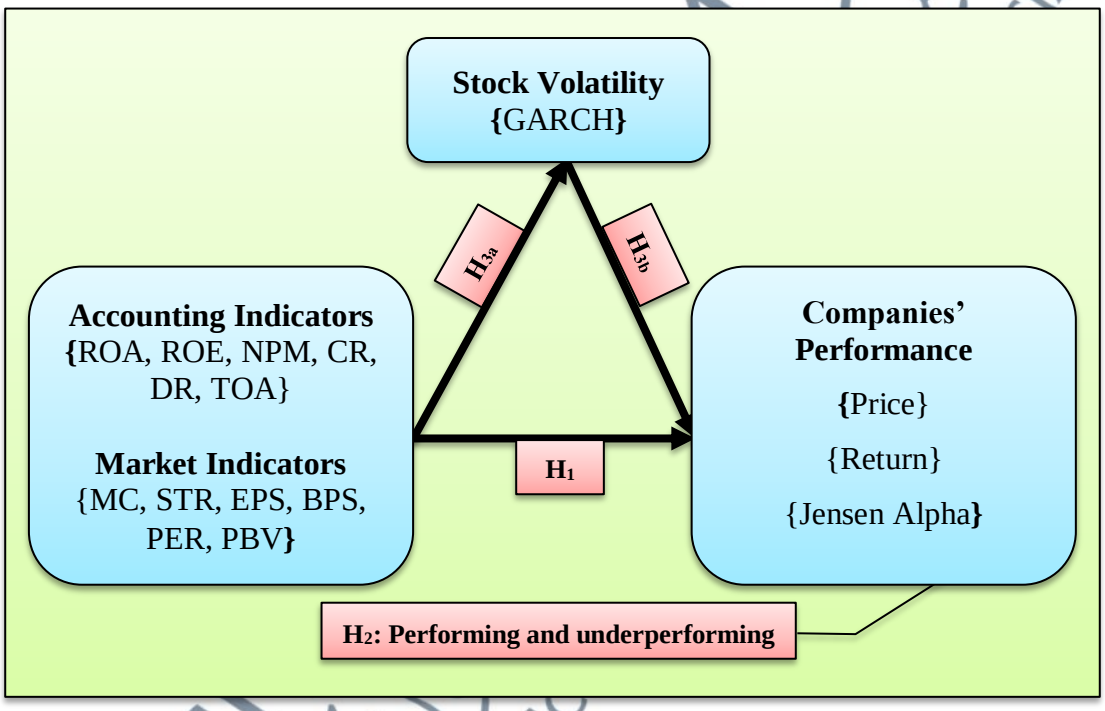
- $H_{3,1}$: Stock price volatility mediates the relationship between return on asset and stock price.
- $H_{3,2}$: Stock price volatility mediates the relationship between return on equity and stock price.
- $H_{3,3}$: Stock price volatility mediates the relationship between net profit margin and stock price.
- $H_{3,4}$: Stock price volatility mediates the relationship between current ratio and stock price.
- $H_{3,5}$: Stock price volatility mediates the relationship between debt ratio and stock price.

- $H_{3,6}$: Stock price volatility mediates the relationship between total assets turnover and stock price.
- $H_{3,7}$: Stock price volatility mediates the relationship between market capitalisation and stock price.
- $H_{3,8}$: Stock price volatility mediates the relationship between stock turnover ratio and stock price.
- $H_{3,9}$: Stock price volatility mediates the relationship between earnings per share and stock price.
- $H_{3,10}$: Stock price volatility mediates the relationship between book value per share and stock price.
- $H_{3,11}$: Stock price volatility mediates the relationship between price earnings ratio and stock price.
- $H_{3,12}$: Stock price volatility mediates the relationship between price-to-book value and stock price.
- $H_{3,13}$: Stock return volatility mediates the relationship between return on asset and stock return.
- $H_{3,14}$: Stock return volatility mediates the relationship between return on equity and stock return.
- $H_{3,15}$: Stock return volatility mediates the relationship between net profit margin and stock return.
- $H_{3,16}$: Stock return volatility mediates the relationship between current ratio and stock return.
- $H_{3,17}$: Stock return volatility mediates the relationship between debt ratio and stock return.

- $H_{3,\ 18}$: Stock return volatility mediates the relationship between total assets turnover and stock return.
- $H_{3,\ 19}$: Stock return volatility mediates the relationship between market capitalisation and stock return.
- $H_{3,\ 20}$: Stock return volatility mediates the relationship between stock turnover ratio and stock return.
- $H_{3,\ 21}$: Stock return volatility mediates the relationship between earnings per share and stock return.
- $H_{3,\ 22}$: Stock return volatility mediates the relationship between book value per share and stock return.
- $H_{3,\ 23}$: Stock return volatility mediates the relationship between price earnings ratio and stock return.
- $H_{3,\ 24}$: Stock return volatility mediates the relationship between price-to-book value and stock return.

3.12 Proposed Research Framework

The three main dimensions of firm characteristics, financial analysis, and Z-score (MDA) provided the most appropriate accounting and market indicators to use in this study. They also determined the suitable measures of firm performance to achieve the study objectives. Furthermore, stock volatility was hypothesized to mediate the effects of accounting and market indicators on company performance. Consequently, the theoretical framework of the study was developed. Figure 3.6 shows the proposed research framework.



Source: The Researcher

Figure 3.6: Proposed Research Framework

The following hypotheses were tested:

H_1: Accounting and market indicators significantly predict stock price and stock return.

H_2: There are significant differences between performing and underperforming companies.

H_{3ab}: Stock price and return volatility mediates the relationships between accounting and market indicators and stock price and return.

3.13 Literature Gaps

This study differs from the existing literature on company performance in many aspects. Initially, the systematic literature review was intended to classify relevant variables into dimensions. After further review of empirical studies on related subjects, this study was found to be able to completement those studies, offering real scientific contribution and becoming a new reference within the extant scientific framework.

Numerous studies have tested the relationships between company performance and numerous variables. Some of them studied the impact of these variables on company performance, while others have measured company performance using financial analysis and various measurement models. The current study provided more comprehensive results regarding the factors that affect stock prices and returns in the financial markets, including the companies' operating activities. Moreover, it's ranked the sample companies based on their performance. The discriminant function was used to rank companies from best to worst performance.

The empirical framework of the study is as follows. Firstly, it used financial indicators as its independent variables. Secondly, it assigned company performance as the dependent variable. Thirdly, stock volatility was used as the mediating variable. Using volatility, this study examined the mediation effect of stock price volatility on the relationships between the indicators and stock price. It also estimated the mediation effect of stock return volatility on the relationships between indicators and stock return. This returned comprehensive findings on the relationships between accounting and market indicators and stock volatility.

There are several studies that are almost identical to the current research. For example, Ligocká & Stavárek (2019) and Haryanti & Murtiasih (2019) studied the effects of financial indicators on stock price (as a proxy for company performance). Kai

& Abdrahman (2018), Musallam (2018), and Din (2017) studied the associations between financial indicators and company performance, measured as stock return. Horobet's (2012) study was also relevant to the present investigation, but it was conducted in a different manner. Mohd Dali et al.'s (2008) study is the closest to the current research.

Nonetheless, there are several distinctive points that make the contributions of this research novel: this study provides new evidences for the research subject by, among others, studying new sample firms and period and variables and employing novel analysis tools. The present study covered the period 2008-2018, while prior studies on the subject of the study covered different sample periods. In addition, the current study examined all constituent firms of the Amman Stock Exchange General Index (ASE Index), whereas past studies were conducted on different samples.

The methods used by past studies to measure company performance are of variety. Some researchers have surveyed investors, owners, and employees. Others analysed performance using Sharpe and Treynor ratios. Financial indicators have also been used as independent variables and dependent variables in many cases. The current study employed a set of accounting and market indicators, including some variables that have not been previously tested. Company performance was evaluated using various measures of performance, namely stock price, stock return, and Jensen's alpha. Most importantly, stock volatility was assigned as the mediator variable. This is the first study to test the mediating effect of stock volatility on the relationships between accounting and market indicators and company performance.

The study also employed four statistical techniques to analyse its data: descriptive analysis, multiple regression, multiple discriminant analysis, and mediator analysis. For the multiple discriminant analysis, performance was measured as Jensen's alpha

technique, and the companies were then classified as either performing or underperforming. The objective of the analysis was to identify the accounting and market indicators that could distinguish between those companies. All these techniques have not been applied at once in previous studies.

Finally, there are gaps in the literature that were covered by the current study through its use of different samples and period and building of new integrated models. The research thus offers significant contribution to expand the body of literature, especially on the measurement of company performance, and open new research opportunities for future studies.

3.14 Conclusion

The main objective of this chapter is to present some basic concepts and financial theories, to systematically review past empirical literature relating to company performance, and to uncover gaps within the body of knowledge. The construction of the research models and the hypotheses of the study will also be developed. The next chapter will describe the data and methodology used to answer the research questions.