

## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.1 Introduction

This chapter presents and discusses the methodology used in this thesis, and the data analysis exploited to provide answers for the research questions set and outlined previously. Section 4.2 discusses a positivist approach, and Section 4.3 presents the research paradigm. Section 4.4 considers and evaluates the research methodology and research design to achieve the study's objectives; it thus focuses on the quantitative methods mainly through regression and secondary data gathered from several different sources. Section 4.5 introduces the research design, including sample selection and data collection. Section 4.6 includes the operational definitions and measurements, dependent and independent variables, control variables, moderator variable, performance measure variables, and model. Finally, a summary of the chapter is presented at the end.

#### 4.2 Positivist Approach

The positivist method is broadly applied when a research study aims to generate universal laws of specific social behaviour. In this view, a positivist approach suggests that social phenomena can be researched similar to natural phenomena; in other words, it assumes social reality such as attributes, beliefs, satisfactions, and behaviours can be subjected to a traditional scientific study by independent observers that could be investigated empirically. Positivist research frequently uses quantitative and statistical

analyses for analysing and interpreting their subject matter. It is widely used and defined as an approach of the natural sciences; people assume that this approach is the most scientific (Neuman, 2006). Neuman (2006) argued that "researchers prefer precise quantitative data and often use experiments, surveys, and statistics. They seek rigorous, exact measures and objective research and they test hypotheses by carefully analysing numbers from the measures". Additionally, Sarantakos (1988) defined this approach from the perspective of the purpose of social research as "a tool for studying social events and learning about them and their interconnections so that general causal laws can be discovered, explained, and documented. Knowledge of events and social laws allows society to control events and to predict their occurrence".

The values contained in the positivist educational philosophies are via a logical sequence of ideas. Results have indicated a significant variation among positivist educational philosophies because such educational philosophies depend mainly on human sources or must be perceived by the human brain in advance via experimentation and verification to be considered valid.

As for its consistency with the Islamic perspective, such consistency is only in form, mainly in the labels used. The principal contradiction is found in the values' sources and objectives. Islam links values with Shariah (Islamic legislation) as the primary source for improvement, and this is not left to humans to think about and verify by their minds. There is a necessary need to differentiate between values in the Islamic perspectives and Western communities' dominant values concerning their sources and objectives, even if these values are admired (Khzali, 2010).

The positivism approach does not align with Islam. There are two main points of opposition. Logical positivism rejects the unseen, while Islam requires faith in the unseen. Logical Positivism rejects morality as unscientific, while morality is a central

part of Islamic teachings. This contradiction means that a methodology for Islamic economics must be radically different from that currently used in conventional economic theory. Some essential elements of an alternative methodology are sketched (Zaman, 2013).

Therefore, the positivist approach was adopted in the research as it assumes that large amounts of comparable data can be objectively collected, analyzed and reported. As previously mentioned, the aim is to compare the empirical findings derived from the study with the theoretical premises reviewed in the literature herein. Moreover, the positivist approach underpins a theoretical focus for the researcher while still being capable of controlling the research process. According to Laughlin (1995), a high level of theorization about the subject of research and a high level of formalization of methods characterizes positivist research. Nevertheless, Laughlin argues that using positivist research is explicitly unrealistic. This could be suggested when positivism is applied in the study of human behaviour where the complex and intangible traits of human nature and the intangible quality of social phenomena might contradict the regularity and systematic effectiveness of the natural world. Laughlin stated, "*Parsimonious assumptions are made, and the theory's ability to provide meaningful predictions of outcomes is used to assess the theory's utility*". For example, Capital Market Theory makes unrealistic assumptions about the completeness of markets, full information, and zero transactions costs but provides predictions about behaviour that fit empirical observations well.

#### **4.3 Research Paradigm**

There are three main epistemological, methodological assumptions: positivism, interpretivism, and realism approaches. For this study, the first approach was used to

study the relationship between CG effectiveness and Malaysia's firm performance. This research follows a quantitative method. This method was utilized because most previous studies in developing countries have examined the relationship between CG effectiveness and firm performance and using quantitative data. Accordingly, the research adopts the positivist epistemology.

#### **4.4 Research Methodology**

After developing the hypotheses and clarifying the study's framework, this section explains the sample selection, data collection procedure, and measurement of variables, amongst others. Secondary data used is described under appropriate headings in this chapter.

Researchers have employed two types of research approaches worldwide: quantitative and qualitative research methods (Adams et al., 2007). The qualitative approach provides a descriptive and non-numeric approach to information gathering to provide an understanding of the phenomenon (Berg 2004). Adams et al. (2007) argued that the qualitative method employs data collection methods and analysis that are non-quantitative, aim to explore social relations, and describe reality as experienced by the respondents. On the other hand, Adams et al., (2007), Hussey and Hussey (2009), and Bryman and Cramer (1997) point that the quantitative approach uses different types of statistical analysis and provides more potent forms of measurement, reliability and ability to generalize. Quantitative approaches refer to the research based on the methodological principles of positivism and neopositivism and adhere to the standards of a strict research design developed before the actual research (Adam et al., 2007). Moreover, Berg (2004) argued that the quantitative method could deal with more extended periods with a larger number of samples, thereby increasing the

circularization capacity. Quantitative research design is used in this study. The quantitative method of data collection was adopted because of the availability of data, convenience, and the nature of the research design that required past and documented facts as a basis for performance evaluation.

The justification for adopting a quantitative method in this study stems from three plausible reasons – 1) the fact that existing theories make it easier to formulate hypotheses that can be tested using statistical tools; 2) provides a framework for addressing the relationship among variables; and 3) is useful for dealing a cause-and-effect relationship.

Furthermore, this study uses the deductive positivism method, whereby the previous theoretical basis is recognized and relied upon in hypotheses development. The experiential findings prove whether the tested hypotheses are rejected or accepted. To accomplish this objective, this study relied on the multiple regression as the primary tool of analysis in which the researcher followed the positivist understanding of the conduct of methodological processes that is “unaffected by the individual perceptual differences (Ardalan, 2012). Hair et al. (2009) stated that “*the appropriate method of analysis when the research problem involves a single metric variable presumed to be related to two or more independent variables*”. Therefore, multiple regression analysis was chosen as the primary tool of analysis in this study. A multiple regression model is one of the most common analysis methods that previous researchers have used to examine the relationship between CG effectiveness and firm’s performance (Ranti, 2011; Al-Sahafi, 2015; Dinga et al., 2009).

#### **4.5 Research Design**

This study uses a descriptive and causal type of research design in fulfilling the objective, that is, an empirical examination of the relationship between CG and the

financial performance of Malaysian Takaful firms from 2010 to 2019. The design is used to test the relationship between board directors' effectiveness and AC effectiveness on financial performance and SCQ as a moderator variable in Malaysian Takaful companies. The data collection is derived through secondary data from published annual reports of Malaysian Takaful companies' websites from 2010 to 2019.

#### **4.5.1 Sampling and Data Collection**

Sekaran and Bougie (2013) said that the population is "the entire group, events, or things of interest that the researcher desires to investigate, and the sample is a subset of the population"

#### **4.5.2 Sample**

This study used panel data gathered from licensed Malaysian Takaful companies in Bank Negara Malaysia from 2010 to 2017. Using panel data for the eight consecutive years, where the same companies serve on the panel over eight years, gives an advantage to measuring the changes between points in time (Cavana et al., 2001). From 2010 and 2017, Malaysian Takaful companies started to increase, before 2009 just 6 Malaysian Takaful companies was established, it is small sample to measure the performance, a big Takaful market developed during this period, and financial reports are available. This period encompasses many important events such as the European debt crisis, Greek government-debt crisis 2015–2016, Chinese stock market turbulence, Turkish currency and debt crisis 2018, and the 1MBD crisis. and the revised the MCCG in 2012 and 2017. Starting 30 June 2018, 4 companies, namely Etiqa Takaful, Syarikat Takaful Malaysia, Takaful Ikhlas and Zurich Takaful have separated the Family and General Takaful and have different board members as well

as different financial statements. Because the population Takaful companies are small, the period of observations must be expanded to evaluate the impact of CG on firm performance.

In this study, the sample comprised eleven firms from the population of Malaysian Takaful companies licensed in BNM, Just Syarikat Takaful Malaysia Berhad Listed in Bursa Malaysia.

**Table 4.1:** Population of the Study

<b>Description</b>	<b>Number of Companies</b>
Total number of overall license Malaysian Takaful Companies in BNM as in 2017	11
Eliminated companies	0
Final Population	11
Total company-year observations for 2010 to 2017	88

#### 4.5.3 Data Collection

As mentioned earlier, this study follows a quantitative research approach. The data were derived from secondary data. All secondary data were hand-collected from the firms' annual reports. They are used to test the relationship between BOD's effectiveness and AC on corporate performance whilst moderated by SCQ. The data are extracted from the annual reports of Malaysian Takaful companies. This study covers eight years consisting of 2010, 2011, 2012, 2013, 2014, 2015, 2016, and 2017.

The variables include three performance measures (ROA, ROE, and EPS), one moderating variable SCQ with six board structures variables, namely, board size, board director's independence, executive member, Muslim directors, meeting frequency and gender diversity were all examined. Four variables representing AC were used, including AC Chairman specialization, AC size, and AC independence and meeting frequency. Finally, three control variables, including firm size, firm age, and

leverage ratio, were all used. Robbins (2009) listed the advantages and disadvantages of using secondary data, as follows:

#### **4.5.4 Advantages of secondary data**

According to Ramadan (2009) and Gujarati (2009), there are a number of advantages for using panel data as follow.

1. Large representation samples well beyond the resources of the individual researchers are available;
2. Useful for examining longitudinal data and looking for trends;
3. Supporting documentation and explanation of methodology, sampling strategy, and data codes are given;
4. The researcher can concentrate on data analysis and interpretation;
5. Considerable cost, time and human capital savings as the data have already been collected;
6. Secondary data can be used as an unobtrusive method to supplement direct survey research and to corroborate the findings.

#### **4.5.5 Disadvantages of secondary data**

However, in spite of these advantages, there are some limitations that need to be addressed and accounted for when dealing with panel data (Baltagi & Giles, 1998; Hsiao, 2007).

1. Data may not be compatible as required by the research;
2. The information may not cover all of the subject or group in the research;
3. The possibility of depth limitation or an oddity in a time series and that the data may not be available to allow investigation of reasons or consequence;
4. Gaps of information; and



5. The possibility of the inconsistency of time series.

#### **4.5.6 Unit of Analysis**

The unit of analysis employed was Malaysian Takaful companies.

#### **4.5.7 Method of Data Analysis**

Descriptive statistics and a multivariate approach were employed to achieve the objective of the current study. Several software packages are used to complete the empirical analysis of this study for each group separately. The SPSS, STATA and Eviews are among the user-friendly and most widely used software and are suitable for cross-sectional studies. Stata and Eviews are statistical packages that can be used for cross-sectional, time series, economics and panel data research. They offer several tests that are not available in other programs. Data cleaning and screening operations were conducted before hypotheses testing. When all the data had been entered into the worksheets, incomplete and missing data were excluded.

#### **4.5.8 Descriptive Analysis**

In academic research on CG, descriptive performance statistics have been widely used (Vafeas, 1999; Abdullah 2004; Weir & Laing 2000; Lam & Lee 2012). A descriptive approach was used in fulfilling the first objective of the study. It is used to describe some situation or attributes by providing measures of an event or activity (Hair et al., 2010). This approach was used to examine the extent of CG on the going concern evaluation in Malaysian Takaful Companies. The descriptive analysis included the mean, the minimum, the maximum, and the standard deviation for each independent and dependent variable.

#### **4.5.9 Multivariate Analysis**

In this study, regression and correlation analysis were used. Based on the literature, regression analysis is a suitable technique used in examining the relationship among the CG mechanisms as independent variables, financial performance as the dependent variable, and SCQ as a moderating variable. Multiple Linear Regressions (MLR) was used to test the proposed model using the STATA analysis program. This was to test the indirect effect between variables through the moderator by multiplying the regression coefficients called Seemingly Unrelated Regression (SUREG).

#### **4.6 Operational Definitions and Measurement of Variables**

This study consists of four categories of variables: dependent variables, independent variables, moderating variables and control variables. Each variable in these four categories requires a particular measurement.

##### **4.6.1 Financial Performance**

Previous empirical studies have used both market-based and accounting-based methods to examine the relationship between CG practices and companies' performance in many different contexts, but the results have been inconclusive. In a meta-analytical review, Dalton et al. (1998) found no agreed-upon view to decide which best method could be relied upon.

The current study used both market-based measures represented by Earning Per Share EPS and accounting-based measures represented by Return on Assets (ROA) and Return on Equity (ROE). They were used as independent variables (Table 4.2).

**Table 4.2:** Summary of the Measurements of the Dependent Variables

Variables	Proxy for measurement	Study/References
<b>Return on Assets</b>	Net income divided by book value of total assets	Alzharani et al., 2011; Anderson and Reeb, 2003; Bhagat and Bolton, 2008.
<b>Return on Equity</b>	Net income divided by shareholders' equity	Alzharani et al., 2011; Anderson and Reeb, 2003; Arslan et al., 2010; Maury, 2006.
<b>EPS</b>	Net income divided by the outstanding common shares.	Filatotehev, 2005; Mashayekhi & Bazazb, 2008, Marn & Romuald, 2012; Abdulsamad et al., 2018.

#### 4.6.2 Corporate Governance Effectiveness

In this study, CG mechanisms are highlighted as the significant factors that influence financial performance. This study has several CG variables (BOD and AC). See Table 4.3.

**Table 4.3:** Summary of the Measurements of the Independent Variables

Variable	Proxy for measurement	Coefficient Predictions	Theory	Study/References
<b>Board size</b>	The total number of directors on the BOD of a firm	+	Agency Theory Stakeholders Theory Resource Dependency Theory	Bhagat & Black, 2002; Bonn, 2004; Coles et al., 2008; Ismail et al., 2009
<b>Board independence</b>	The proportion of independent non-executive directors to total board members	+	Agency Theory Stewardship Theory	Hayes, Mehran & Schaefer, 2004; Klein, 1998 & Habbash, 2010
<b>Executive Membership</b>	A dummy variable equal to "1" if any of BOD member has an executive position, and "0" if otherwise	+	Agency Theory Stewardship Theory	Kusnadi, 2011; Amran, 2010; Lee et al. 2004; Wong & Yek, 1991 Abur, 2007
<b>Muslim Directors</b>	The proportion of Muslim directors to total board members		Agency Theory Stakeholders Theory Resource	Qasem & Abdullatif, 2014; Ibrahim & Hanefah, 2016 and Garcaí-Sánchez et al. 2017

Variable	Proxy for measurement	Coefficient Predictions	Theory	Study/References
<b>Meeting Frequency</b>	Total number of BOD meetings over the year	+	Agency Theory Stewardship Theory	Al-Ghamdi, 2012; Karamanou & Vafeas, 2005; Vafeas, 1999
<b>Gender Diversity</b>	The proportion of woman directors on the board to the total number of BOD members	+	Agency Theory Resource Dependency Theory	Qasem & Abdullatif, 2014; Ibrahim & Hanefah, 2016; Garcaí-Sánchez et al., 2017
<b>Chairman Specialization</b>	A dummy variable equal to “1” if the AC chairman has an accounting qualification and “0” if otherwise	+	Agency Theory	Rashidah & Fairuzana, 2006
<b>AC Size</b>	The total number of directors on the AC of a firm	+	Agency Theory Stakeholders Theory Resource Dependency Theory	Baxter, 2007); Carcello & Neal, 2000, Cotter & Silvester, 2003; Klein, 2002
<b>AC Independence.</b>	The proportion of independent directors on the AC to the total number of directors on the AC	+	Agency Theory Stewardship Theory	Baxter, 2007; Carcello & Neal, 2000; Cotter & Silvester, 2003; Klein, 2002
<b>Meeting Frequency</b>	The number of AC meetings held during the year	+	Agency Theory Stewardship Theory	Van der Zahn & Tower, 2004; Xie et al., 2003

#### 4.6.3 Moderating Variable

The moderator variable in this study was the Shariah Committee Quality. The AAOIFI (2010) recommended establishing an SC with at least three members, one of whom should have sufficient expertise in Islamic finance rather than jurisprudence. In addition, Farook et al., (2011) reported that SC members should have academic qualifications. Verriest et al., (2013), and Rasli et al., (2020) indicated that aggregated

indices would measure governance quality more accurately than single indicators. For this reason, an SC-index was used as a proxy for the SC quality. The SC-index contained six key board attributes, as illustrated in Table 4.4.

**Table 4.4:** Summary of the Measurements of the Moderator

Variable	Proxy for measurement	Coefficient Predictions	Theory	Study/References
<b>Shariah Committee Expertise</b>	Dummy variable equal to “1” if any SC member had experience in the field of IFIs and “0” if otherwise	+	Resource Dependence Theory Stakeholders Theory	Noordin et al., 2015; Ajili & Bouri, 2018, Ramly & Nordin. 2018); Neifar et al., 2020; Islam & Bhuiyan, 2019
<b>Multi committee membership</b>	Dummy variable equal to “1” if any SC member has more than one SC directorship and “0” if otherwise	+	Resource Dependence Theory Stakeholders Theory	Noordin, et al., (2015), Ajili & Bouri (2018), Islam & Bhuiyan, (2019)
<b>Qualification</b>	Dummy variable equal to “1” if any of the SC members holds a PhD and “0” if otherwise	+	Resource Dependence Theory Stakeholders Theory	Ajili & Bouri (2018), Ramly & Nordin., 2018; Neifar et al.; 2020, Rasli et al.; 2020); Islam & Bhuiyan. 2019
<b>Shariah Committee Size</b>	Dummy variable equal to “1” if the SC have less than five members and “0” if otherwise	+	Stakeholders Theory Agency Theory	Ajili & Bouri, 2018, Neifar et al., 2020; Rasli et al., 2020; Islam & Bhuiyan, 2019
<b>Shariah Committee Meeting Frequency</b>	Dummy variable equal to “1” if the SC meet more than five meetings and “0” if otherwise	+	Stakeholders Theory Agency Theory	Neifar et al., 2020; Rasli et al., 2020; Islam & Bhuiyan, 2019
<b>Shariah Committee Gender Diversity</b>	Dummy variable equal to “1” if the SC have female and “0” if otherwise	+	Stakeholders Theory Agency Theory	Ramly & Nordin, 2018; Rasli et al., 2020; Islam & Bhuiyan, 2019

Note: Moderator variable SC quality: SCQ-index Total number of SC

recommendations respected by the firm /6 ( Neifar et al., 2020, Rasli et al., 2020; Ajili & Bouri, 2018; Mathew et al., 2018).

#### 4.6.4 Control Variables

A set of control variables are included in the regressions to increase the confidence of the results. (See Table 4.6). The control variables were used to investigate the performance. Different studies have used different control variables (Kassim et al., 2013; Black et al., 2006; Shin and Stulz, 2000; Yermack, 1996; Morck et al., 1988).

The study considered several control variables that could affect firm performance to measure the impact of the effectiveness of the board of directors on firm performance. The research depended on the literature and the available data in selecting the control variables. Therefore, this study set firm size, firm age, and the leverage ratio as a control variable.

Firm size: Numerous previous studies have used total assets as a proxy for firm size (e.g., Sanda et al., 2010; Aldamen et al., 2012; Desoky & Mousa, 2012; Kassim et al., 2013; Kowalewski, 2012; Aggarwal, 2013; Vo & Phan, 2013; Marashdeh, 2014; Kouki & Guizani, 2015; Yussof et al., 2020). In this study, to decrease skewness and kurtosis, total assets were transformed into logs. Thus, in this study, firm size was measured by a natural log of total assets.

Firm Age: Firm age indicates the number of years that a firm has been in operation. Firm age is measured by the number of years from the time the firm is established (Coad et al., 2016). Firm age is a crucial factor in firm development (Evans, 1987). Moreover, Borghesi et al. (2007) proved that corporates go through financial growth cycles, and their capital structures vary with their age (Berger & Udell, 1998; Gregory et al., 2005). In the same regard, Evans (1987) observed that older firms were generally more experienced and skilled, but less dynamic and less flexible in adjusting to alterations or modifications in the business environment. With

an increase in firm age, management gathers much more of an understanding of their capabilities and skills over time (Evans, 1987; Atkinson & Storey, 2016).

Also, firm age increases the response to the aggregate needs and benefits of monitoring and specialization by board members (Boone et al., 2007). Firm age has been associated with several decisions of firms (Berger & Udell, 1998; Gregory et al., 2005; Boone et al., 2007; Halling & Zechner, 2016). New companies are anticipated to have smaller earnings than older companies because they have less experience in the market and are still building their market positions, and generally have a greater costs structure (Ward and Mendoza 1996).

Leverage: This factor appears as a control variable in the measurement of firm performance in many previous studies (e.g., Javed & Iqbal, 2006; Bhagat & Bolton, 2009; Desoky & Mousa, 2012; Saravanan, 2012; Kassim et al., 2013; Vo & Phan, 2013; Marashdeh, 2014; Kouki & Guizani, 2015). In this study, leverage equals the ratio of total liabilities divided by total assets.

**Table 4. 5:** Summary of the Measurements of the Control Variables

Variable	Proxy for measurement	Coefficient Predictions	Theory	Study/References
<b>Firm Size</b>	The book value of the total company assets	+	Agency Theory	(Haniff & Huduib, 2006; Kouki & Guizani, 2015).
<b>Firm Age</b>	The number of years from the time the firm was incorporated	+	Agency Theory	(Geroski, 1995; Halling & Zechner, 2016)
<b>Leverage Ratio</b>	The debt/asset ratio	+	Agency Theory	(Halling & Zechner, 2016; Hossain, 2009).

#### 4.7 Independent Variables Effectiveness

The independent variables in this research consist of two main groups: board of director effectiveness, and audit committee effectiveness.

#### **4.7.1 Board of Director Effectiveness**

In this study, board of director effectiveness was measured as an individual and a composite measure. The individual measurement of the board of director effectiveness was determined by identifying the effectiveness of each individual characteristic and how the effectiveness of each individual characteristic can enhance firm performance. These include board size, board independence, executive membership, Muslim directors board meetings, and Gender Diversity. As for the composite measurement of the board of directors' effectiveness, this measurement is calculated by summing the value of the six-individual effectiveness into one score and determining how this score can be effective in enhancing firm performance.

##### **4.7.1.1 Board Size**

Board size (BS) was measured as the total number of directors sitting on the board who are not on the audit committee. Lee et al. (2004) previously used this metric. To construct this metric, BS was coded "1" if the number of the board members was higher than the sample median, and "0" if otherwise.

##### **4.7.1.2 Board Independence**

Board Independence (BIND) was measured as the percentage of independent non-executive directors on the board who are not on the audit committee divided by total directors. Prior studies such as Amran and Che Ahmad (2009; 2010), Cicero et al. (2010), and Zainal Abidin et al. (2009) used this metric. To construct this metric, BIND was coded "1" if the percentage of the BIND on the board was higher than the sample median, and "0" if otherwise.



#### **4.7.1.3 Executive Membership**

Executive Membership (EM) was measured as a dummy variable equal to “1” if any member of the BOD had an executive position in the firm, and “0” if otherwise. Prior studies such as Anderson et al., (2004), Carney & Gadajlovic (2003), and Filatotchev et al., (2005) used this metric. To construct this metric, EM was coded “1” if the percentage of the EM on the board was higher than the sample median, and “0” if otherwise.

#### **4.7.1.4 Muslim Directors**

Muslim Directors (MD) was measured as the proportion of Muslim directors on the board to the total number of BOD members. Prior studies such as Yunus (2011) and Abdul Rahman & Ali (2006) used this metric. To construct this metric, MD was coded “1” if the percentage of the MD on the board was higher than the sample median, and “0” if otherwise.

#### **4.7.1.5 Board Meeting frequency**

Board meetings frequency (BMF) was measured as the number of board of directors’ meetings during the year. Prior studies such as Al-Ghamdi (2012), Karamanou and Vafeas (2005), and Vafeas (1999) used this metric. To construct this metric, BMF was coded “1” if the number of BMF during the year was higher than the sample median, and “0” if otherwise.

#### **4.7.1.6 Gender Diversity**

Gender Diversity (GD) was measured as the proportion of Woman directors on the board to the total number of BOD members. Prior studies such as Qasem and Abdullatif (2014), Ibrahim and Hanefah (2016) and Garcaí-Sánchez et al. (2017) used

this metric. To construct this metric, GD was coded “1” if the percentage of the GD on the board was higher than the sample median, and “0” if otherwise.

#### 4.7.1.7 Board of Directors’ Effectiveness Score

Board of directors’ effectiveness score (BDE\_SCORE) was a composite measure that summed the value of the above-mentioned six dichotomous effectiveness of the board to establish a measurement for each board-firm effectiveness score. Each score was either 1 or 0. The higher the score, the higher the effectiveness of the board of directors (Mathew et al., 2018).

The six binary scores of effectiveness included in the composite measurement were: board size, board independence, executive membership, Muslim directors, board meetings, and Gender Diversity. The range of the score was from 0 to 6. The use an aggregated measure as a score of effectiveness, as Agrawal and Knoeber (1996) suggested, create a better measure of effectiveness than the individual metrics. That is because the results associated with an individual mechanism could be flawed, and the effects of various single mechanisms are weakened in the combined model. The impact of the combined score is a better measure than a single score (O’Sullivan et al., 2008).

**Table 4.6:** Calculating Board of Directors’ Effectiveness Score (BDE\_SCORE)

<b>BDE_SCORE</b>	<b>Board of directors’ effectiveness score calculated by “1-0.” The higher the score, the higher the effectiveness of the board</b>
<b>BS</b>	Board size is coded “1” if the total number of directors sitting on the board who are not on the audit committee is higher than the sample median, and “0” if otherwise (Resource Dependence Theory).
<b>BIND</b>	Board of directors’ independence is coded “1” if the percentage of independent non-executive directors who are not on the audit committee is higher than the sample median, and “0” if otherwise (Agency Theory).
<b>EM</b>	Executive membership is coded “1” if any of member of the BOD have an executive position in the firm, and “0” if otherwise (Stewardship Theory).

<b>MD</b>	Muslim director member is coded “1” if the number of Muslim director percentage on the board is higher than the sample median, and “0” if otherwise (Agency Theory).
<b>BMF</b>	Board meetings are coded “1” if the number of board of directors’ meetings during the year is higher than the sample median, and “0” if otherwise (Agency Theory).
<b>GD</b>	Board woman member is coded “1” if the number of woman members on the board is higher than the sample median, and “0” if otherwise (Agency Theory).

#### **4.7.2 Audit Committee Effectiveness**

Audit committee effectiveness in this study was measured as an individual and a combined measure. The individual measurement of audit committee effectiveness was determined by identifying the effectiveness of each individual characteristic and how the effectiveness of each individual characteristic can enhance firm performance. These include AC Chairman Specialization, AC Size, AC Independence and Meeting frequency. As for the combined measurement of the audit committee effectiveness, this measurement was calculated by summing the value of the four-individual effectiveness into one score and examining how this score can be effective in enhancing firm value.

##### **4.7.2.1. Audit Committee Chairman Specialization**

Audit Committee Chairman Specialization (ACCS) was measured as a dummy variable equal to “1” if the AC chairman had an accounting qualification and “0” if otherwise. To construct this metric, ACCS was coded “1” if the ACCS held an accounting certificate, and “0” if otherwise.

##### **4.7.2.2 Audit Committee Size**

Audit Committee Size (ACS) was measured as the total number of directors sitting on the audit committee. Prior studies such as Al-najjar (2011), Ayemere and Elijah (2015), Siam et al., (2018), and Mohamed et al. (2014) used this metric. To

construct this metric, ACS was coded “1” if the number of ACS on the audit committee was higher than the sample median, and “0” if otherwise.

#### **4.7.2.3 Audit Committee Independence**

Audit committee independence (ACINDE) was measured as the percentage of independent non-executive members on the audit committee divided by the total members. Prior studies such as Anderson et al. (2004) and Klein (1998; 2002) used this metric. To construct this metric, ACINDE was coded “1” if the percentage of the ACINDE on the AC was higher than the sample median, and “0” if otherwise.

#### **4.7.2.4 Audit Committee Meeting Frequency**

Audit committee meetings (ACMF) was measured as the number of audit committee meetings during the year. Prior studies such as Abdul Rahman & Ali (2006), Anderson et al. (2004), Kent et al. (2010), Kent & Stewart (2008), and Xie et al. (2003) used this metric. To construct this metric, ACMF was coded “1” if the number of ACMF during the year was higher than the sample median, and “0” if otherwise.

#### **4.7.2.5 Audit Committee Effectiveness Score**

In terms of the ACE\_SCORE, the score was a composite measure that summed the value of the four dichotomous audit committee's effectiveness to create a firm-specific summary measure of its audit committee effectiveness. Each score was either 1 or 0. The total score could range from 0 to 4. The higher the score, the higher the effectiveness of the audit committee. The four-binary metrics included in this measurement were: AC Chairman Specialization, Shariah Background, AC Independence and Meeting frequency.

Using an aggregated measure to combine audit committee effectiveness as a score of effectiveness (AC Chairman Specialization, Shariah Background, AC Independence and Meeting frequency) as Agrawal and Knoeber (1996) and Ward et al. (2009) suggested, the results were more accurate. That is because the impacts associated with the impact of an individual mechanism could be flawed, and the effects of various single mechanisms are weakened in the combined model. The measurement of the combined impact is more accurate, contrasted with the measurement of individual impacts (O’Sullivan et al., 2008). See Table 4.7 below.

**Table 4.7:** Calculating Audit Committee Effectiveness Score (ACE\_SCORE)

ACE_SCORE	Audit committee effectiveness score calculated by “1-0.” The higher the score, the higher the effectiveness of the audit committee.
ACCS	Audit Committee Chairman Specialization was coded “1” if the ACCS held an accounting certificate, and “0” if otherwise.
ACS	Audit committee size was coded “1” if the number of the ACS on the audit committee as higher than the sample median, and “0” if otherwise.
ACIND	Audit committee independence was coded “1” if the percentage of independent non-executive directors was higher than the sample median, and “0” if otherwise (Agency Theory).
ACMF	Audit committee meetings frequency was coded “1” if the number of audit committee meetings during the year was higher than the sample median, and “0” if otherwise (Agency Theory).

#### 4.8 Diagnostic Tests

Several regression diagnostics were performed on the data sample to check if the multiple regressions' general assumptions were fulfilled and avoid misleading findings. Essential diagnostic tests were undertaken, such as those for outliers and normality. Also, multicollinearity, heteroscedasticity, autocorrelation tests and endogeneity were conducted.

##### 4.8.1 Outliers

An outlier “is an observation that is much different (either very small or very large) in relation to the observations in the sample” (Gujarati, 2009, p. 367). An

outlier may be due to fluctuations in the measurement or indicate an experimental error (Hair et al., 2009). There are two main ways of dealing with outliers (Ramsey, 2009). The first way is identifying all the outliers and then eliminating them manually from the analysis. In other words, one trims or removes outliers from the dataset to allow for more robust statistical analysis. According to Ren (2014), the second way is winsorizing the data: it is a method to assign outliers the next highest or lowest value found in the sample that is not an outlier". In this way, the outliers are replaced, and then the sample size does not change, and the power is unaffected (Lusk et al., 2011; Ren, 2014).

#### **4.8.2 Normality**

"Normality means that the distribution of the error or residuals is normally distributed" (Amran, 2010). To check for normality, statistical or graphical methods are used. Skewness and kurtosis are two measures to describe the shape of any distribution. Skewness is a statistical figure that reveals whether the distribution is symmetric or not. Symmetric distribution occurs if the left side of the curve distribution is similar to the right side. A negative skew denotes that a distribution has shifted to the right, while a positive skew denotes a shift to the left (Hair et al., 2009).

Kurtosis is any measure of the peakedness of the possible distribution of a real value of a random variable (Dodge et al., 2003). According to Haniffa and Hudaib (2006), data is considered to be normal if the standard skewness within  $\pm 1.96$  and standard kurtosis is  $\pm 3$ .

A histogram is a graphical analysis of normality; this test focuses on the histogram and discovers whether it approximates a normal distribution (Zaiontz, 2015).

### **4.8.3 Multicollinearity**

The problem of multicollinearity (also known as collinearity) appears when several predictor variables in one multiple regression model are highly correlated (Field, 2013). Multicollinearity may lead to unreasonable outcomes when examining how well the independent variables contribute to understanding the dependent variable. This is especially the case if the correlation between predictor variables is more than 0.9 (Hair et al., 2009).

The study used the Variance Inflation Factor (VIF) to determine whether a multicollinearity problem existed. The VIF shows how much the variance of the estimated regression coefficients are inflated as compared to when the independent variables are not linearly correlated. If the VIF is greater than 10, this indicates high multicollinearity (Gujarati, 2009; Hair et al., 2009).

### **4.8.4 Heteroscedasticity**

Heteroscedasticity arises if the variance of the disturbance is not constant. To check for heteroscedasticity, this study used the Modified Wald test (Greene, 2007). The Modified Wald test examines the null hypotheses. Therefore, if the p-value is greater than 0.05, the study rejects the null hypothesis and finds heteroscedasticity.

When the heteroscedasticity problem appears, it can be remedied by transforming the data using the Weighted Least Square method, or Heteroscedasticity-Consistent Standard Error (Gujarati, 2009; Hair et al., 2009).

### **4.8.5 Autocorrelation**

Autocorrelation is defined as “a correlation between members of a series of observations ordered in time as in time-series data or space as in cross-sectional data”

(Kendall & Buckland, 1971). Many ways exist to detect autocorrelation, such as the “Durbin–Watson d test, the asymptotic normality test, the Berenblutt–Webb test, and the Breusch–Godfrey test” (Gujarati, 2009)

In the panel data model, Drukker (2003) used the Woodridge test to identify serial correlation in the panel data's characteristic error term. This test is better because it requires relatively few assumptions and is easy to apply (Amran, 2010; Ren, 2014).

#### **4.8.6 Endogeneity**

The endogeneity problem has recently been the subject of greater attention in CG (Ali, 2013). Wooldridge (2016) concluded that endogeneity could occur for several reasons: First, if there is an omitted variable that is correlated with some regressors; second if the dependent and independent variables are concurrently determined (i.e., there is simultaneous causality), and third, when there is any measurement error. Previous studies have suggested several methods for solving the endogeneity problem. One is the fixed effect model (FEM) (Baltagi & Giles, 1998; Yunos, 2011; Ren, 2014). Himmelberg et al. (1999) pointed out that the FEM is a method to control for the endogeneity problem. Moreover, Yunos (2011) and Ren (2014) mentioned that if the standard error is corrected for autocorrelation and heteroscedasticity, endogeneity will not influence coefficient estimates.

#### **4.9 Panel Data**

Various advantages can be gained from using panel data. For instance, this type of data can control the level of individual heterogeneity, has more efficiency, more degrees of freedom, lower collinearity among the variables, and more variability can control the extent of the impact of omitted variables and is more informative (Baltagi,



2008; Hsiao, 2003). The use of panel data is particularly important in the current study because the heterogeneity of the data needs to be controlled; the data for the 11 companies differed from each other and a prolonged period (10 years) was covered, and time-series or cross-sectional data cannot manage this issue.

The data in the current study was set as unbalanced panel data because there was missing data due to some incomplete annual reports. This means that the total number of observations for each year was not equal to those of other years. First, the data were subjected to descriptive analysis, which identified the mean, minimum, maximum and the standard deviation of all the variables (dependent, independent, control, and moderator). An outlier test, normality, linearity, multicollinearity, homoscedasticity, autocorrelation, contemporaneous correlation, F-test, and Hausman test were performed. Multiple linear regression (MLR) was utilized to test the direct relationships between the independent variables and the dependent variable using Stata /Amos and SPSS.

#### 4.10 Model Used

This study used the following three models to study SCQ moderation's impact on the relationship between CG effectiveness and Firm performance.

(IV= Independent variable, DV= Dependent variable, MV= Moderating Variable)

**Model (1):** *Dependent variable with Independent variables*

##### Direct effect model 1

$$\text{ROA} = \beta_0 + \beta_1 \text{BS} \text{ it} + \beta_2 \text{BIND} \text{ it} + \beta_3 \text{EM} \text{ it} + \beta_4 \text{MD} \text{ it} + \beta_5 \text{BMF} \text{ it} + \beta_6 \text{GD} \text{ it} + \beta_7 \text{ACCS} \text{ it} + \beta_8 \text{ACS} \text{ it} + \beta_9 \text{ACIND} \text{ it} + \beta_{10} \text{ACMF} \text{ it} + \beta_{11} \text{FSIZE} + \beta_{12} \text{FAGE} + \beta_{13} \text{LR} + \text{uit}$$

$$\text{ROE} = \beta_0 + \beta_1 \text{BS}_{it} + \beta_2 \text{BIND}_{it} + \beta_3 \text{EM}_{it} + \beta_4 \text{MD}_{it} + \beta_5 \text{BMF}_{it} + \beta_6 \text{GD}_{it} + \beta_7 \text{ACCS}_{it} + \beta_8 \text{ACS}_{it} + \beta_9 \text{ACIND}_{it} + \beta_{10} \text{ACMF}_{it} + \beta_{11} \text{FSIZE} + \beta_{12} \text{FAGE} + \beta_{13} \text{LR} + u_{it}$$

$$\text{EPS} = \beta_0 + \beta_1 \text{BS}_{it} + \beta_2 \text{BIND}_{it} + \beta_3 \text{EM}_{it} + \beta_4 \text{MD}_{it} + \beta_5 \text{BMF}_{it} + \beta_6 \text{GD}_{it} + \beta_7 \text{ACCS}_{it} + \beta_8 \text{ACS}_{it} + \beta_9 \text{ACIND}_{it} + \beta_{10} \text{ACMF}_{it} + \beta_{11} \text{FSIZE} + \beta_{12} \text{FAGE} + \beta_{13} \text{LR} + u_{it}$$

**Model (2) Dependent variable with BODE and ACE**

**Direct effect model 2**

$$\text{ROA} = \alpha + \beta_1 \text{BODE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + B_3 \text{FSIZE} + B_4 \text{FAGE} + B_5 \text{LR} + u_{it}$$

$$\text{ROE} = \alpha + \beta_1 \text{BODE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + B_3 \text{FSIZE} + B_4 \text{FAGE} + B_5 \text{LR} + u_{it}$$

$$\text{EPS} = \alpha + \beta_1 \text{BODE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + B_3 \text{FSIZE} + B_4 \text{FAGE} + B_5 \text{LR} + u_{it}$$

**Model (3): variable with Moderating Variable SCQ**

**Moderating effect of SCQ between BDE score, ACE score and Financial performance**

$$\text{ROA} = \alpha + \beta_1 \text{BDE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + \beta_3 \text{SCQ}_{it} + \beta_4 \text{BDE\_SCORE}_{it} * \text{SCQ}_{it} + \beta_5 \text{ACE\_SCORE}_{it} * \text{SCQ}_{it} + B_6 \text{FSIZE} + B_7 \text{FAGE} + B_8 \text{LR} + u_{it}$$

$$\text{ROE} = \alpha + \beta_1 \text{BDE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + \beta_3 \text{SCQ}_{it} + \beta_4 \text{BDE\_SCORE}_{it} * \text{SCQ}_{it} + \beta_5 \text{ACE\_SCORE}_{it} * \text{SCQ}_{it} + B_6 \text{FSIZE} + B_7 \text{FAGE} + B_8 \text{LR} + u_{it}$$

$$\text{EPS} = \alpha + \beta_1 \text{BDE\_SCORE}_{it} + \beta_2 \text{ACE\_SCORE}_{it} + \beta_3 \text{SCQ}_{it} + \beta_4 \text{BDE\_SCORE}_{it} * \text{SCQ}_{it} + \beta_5 \text{ACE\_SCORE}_{it} * \text{SCQ}_{it} + B_6 \text{FSIZE} + B_7 \text{FAGE} + B_8 \text{LR} + u_{it}$$

**Where:**

**Independent variables:**

BS = Board size

BIND = Board Independence

EM = Executive Membership

MD= Muslim Director

BMF = Board Meeting Frequency

GD = Gender Diversity in the Board

ACCS = Audit Committee Chairman Specialization

ACS = Audit Committee Size

ACIND = Audit Committee Independence

ACMF = Audit Committee Meeting Frequency

***Moderator:***

SCQ = Shariah Committee Quality

***Dependent variables:***

ROA = Return on Assets

ROE = Return on Equity

EPS= Earnings Per Share

***Control Variables:***

FSIZE = Firm Size

FAGE = Firm Age

LR = Leverage ratio

i = a company and t = year

$\beta_0$  = intercept, measures the expected value of the risk-free rate if the regression equals to zero

$\beta_1$  = the coefficient of the independent variable

u = the error term

#### **4.11 Chapter Summary**

This chapter considered the research paradigm, and the research method used was described (mainly a quantitative method). Sample selections and all the dependent and independent variables with the control variables were introduced. All data used were found in annual financial reports of Malaysian Takaful companies (from 2010 to 2017). This study uses secondary data to test the relationship between 'BOD' effectiveness and AC on firm performance as moderated by SCQ. All materials and methods used in the current study were presented and discussed in line with the appropriate methodology adopted from the literature. The primary research approach used, which was a quantitative method, was detailed. Per the objectives of this study, the research design was discussed under the appropriate heading. The sampling and data collection technique and analysis, including the descriptive statistics and multivariate approaches, were explained. The operational definitions and measurement of variables were presented concerning the adopted variables based on the relevant literature. The method used in assessing the moderating variable, i.e., SCQ was presented and discussed. The control variable in relation to corporate performance was also detailed. The next chapter will analyze the research findings and present the discussion of the results from quantitative data.