

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous chapter reviewed the theories used in this study and discussed the theoretical framework used to determine the relationships between corporate governance and board diversity with CSR. This chapter discusses the methodology used to address the objectives and test the research framework and hypotheses stated in Chapter Three. The following section explains the sample selection, followed by data collection. The content analysis method is discussed in detail, including a brief explanation of the measurement of dependent and independent variables, and scoring of the disclosure items. The final section in this chapter outlines the data analysis method used in this study.

4.2 SAMPLE SELECTION

The population of the study consists of all companies listed on the first and second markets of the Amman Stock Exchange (ASE). Table 4.1 shows the number of companies listed on the ASE by markets. Companies are classified into three major sectors, namely financial, services, and industrial. These sectors are broken down into a total of 23 sub-sectors, as shown in Table 4.2. However, the reason for the inclusion of the financial sector in the sample is due to the importance of this sector in the Jordanian economy. For example, banks in Jordan accounted for 44.6% of total stock

market capitalization. In addition, the financial sector ranked first among other sectors in terms of trade volume and the number of traded shares with 67% (ASE, 2011). Lim et al. (2008) stated that including companies from the finance sector in CSR studies will provide a greater generalisability of the results. The inclusion of the financial sector which was previously ignored by Jordanian studies such as Al-Khadash (2003), Suwaidan et al. (2004) and Ismail and Ibrahim (2008), will allow the study to cover a broad range of business activities to provide more comprehensive exploration and analysis of CSR practices in Jordan. This is based on the view that regulations related to corporate governance and CSR in ASE is for all listed companies regardless of industry.

The sample covers a period of four years, from 2007 till 2011. The year of 2009 was excluded in this study, since a change was made in the regulation. The corporate governance code of 2009 was supposed to take effect as of January 1, 2009 but the Jordan Securities Commission (JSC) gave companies enough time to prepare for implementing this code thus, some companies started implementing this code in the same year while others in the following year. In practice, all Jordanian companies begun implementing this code in 2010 where JSC requested all companies listed on the ASE to have a special chapter regarding the implementation of the corporate governance code in their annual report. Therefore, excluding this year from the sample seem to be reasonable to avoid any bias or misleading results.

After excluding 106 companies over the study period (2007, 2008, 2010 and 2011), which contain 47 companies due to unpublished annual reports and or missing data along with 59 companies that changed their listing from the first and second markets

from year to year, the sample size for this study consisted of 117 companies chosen from the first and second markets of ASE.

Stratified random sampling method is used according to market type to represent the first and second markets as subgroups. The study used this sampling method because the population of this study is considered a heterogeneous group representing two different markets (first and second markets) each one with different requirements in order to be listed in ASE. It is important to employ this method since the study aims to compare CSR disclosure levels between the first and second markets for Jordanian listed companies. In this method, the population is divided into homogeneous group (strata). According to Sekaran (2003), using stratified random sampling is an efficient method because more valuable and differentiated information is obtained with respect to each group. Table 4.3 shows the selection procedures of sampled companies. The sample represents 46% of the entire population. According to Sekaran (2003), the more samples representing the population, the more generalised the research findings. Hence, the results of this study are expected to be more accurate as the findings can be more generalised. The determination of the sample size was based on the sample size table developed by Krejcie and Morgan (1970), and cited in Sekaran (2003). They suggested the following formula for calculating sample size. A list of the sample companies in the current study is shown in Appendix A.

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Table 4.1 Listed Companies by Business Markets

Year	First market	Second market	Total
2007	112	133	245
2008	126	136	262
2010	112	165	277
2011	95	152	247

Table 4.2 Sectors and Sub- Sectors in ASE

Financial sector		Services sector		Industries sector	
No	Sub sector	No	Sub sector	No	Sub sector
1	Banks	1	Real Estate	1	Pharmaceutical and Medical Industries
2	Insurance	2	Health Care Services	2	Chemical Industries
3	Financial Services	3	Educational Services	3	Paper and Cartoon Industries
		4	Hotels and Tourism	4	Printing and Packaging
		5	Transportation	5	Food and Beverages
		6	Technology and Communications	6	Tobacco
		7	Media	7	Mining and Extraction Industries
		8	Utilities and Energy	8	Engineering and Construction
		9	Commercial Services	9	Electric Industries
				10	Textiles, Leather and Clothing
				11	Glass and Ceramic Industries

Table 4.3 Summary of the Sample Selection

Listed Companies	Number of Companies
All listed companies in ASE for 4 years	245 companies in 2007 262 companies in 2008 277 companies in 2010 247 companies in 2011
(-) Companies with unpublished annual reports and or missing data.	47
(-) Companies that changed their listing from the first and second markets from year to year	59
New population	151
First market	67
Second market	84
Final Sample	117
First market	52
Second market	65

4.3 DATA COLLECTION

This study is based on secondary data collected from the annual reports of Jordanian companies for the years 2007, 2008, 2010 and 2011, i.e. two years pre and post implementation of the CG code in 2009. Choosing these years allows for evaluating and comparing CSR levels from before and after the code's implementation.

An annual report is the most important source of CSR (Lim et al., 2008), and a primary channel of communication of CSR information (Wiseman, 1982; Gray et al., 1995). Hanafi (2006) argued that annual reports are considered the most reliable source of social and environmental information when compared to other sources, such as internet websites, media releases, newspaper advertisements, and company brochures or booklets because these sources are very expensive, time-consuming, and infeasible approaches (Hanafi, 2006). Meanwhile, the information provided by annual reports has a high level of credibility, accessibility, and availability (Tilt, 1994; Adams et al., 1998). Abu-Baker and Naser (2000) stated that an annual report offers the most disclosure channels to study CSR in developing countries. Meanwhile, other disclosure channels are seldom used in the majority of companies. The reason for this is that annual reports are used by companies as a way to demonstrate its own social image within society (Niemark, 1992), and as a medium for companies to promote themselves (Gray et al., 1995). Annual reports are also regarded as legal documents because they are required by legislation.

In previous studies, annual reports have been the main source of social and environmental disclosure, such as Hackston and Milne, 1998; Adams et al., 1998;

Abu-Baker and Naser, 2000; Al-Khadash, 2003; Haniffa and Cooke, 2005; Barako and Brown, 2008; Rashid and Lodh, 2008; Lim et al., 2008; Said et al., 2009 and Khan, 2010. In Jordan, annual reports are widely used as the main data source for CSR (Abu-Baker and Naser, 2000; Ismail and Ibrahim, 2008). They are also the most easily accessible source for studying social disclosures, because annual report comparisons from Jordanian companies with other sources are more cost-effective (Al-Khadash, 2003).

Given the many aforementioned benefits, the annual report is also associated with some disadvantages. For example, the annual report provides information that may affect the timeliness of reporting which influences the decision makers because it is produced on an annual basis and thus, is less efficient when compared to corporate website that provide up-to-date information to users quickly, and allow users to comment and provide feedback (Gandia, 2003). However, this study examines the level of CSR within the annual reports of Jordanian companies for a period of four years. The results of this study will highlight the importance of board diversity and corporate governance as factors that affect CSR in Jordan by comparing CSR practices before and after implementation of the corporate governance code.

4.4 CONTENT ANALYSIS

Content analysis is widely used in conducting social science studies (Krippendorff, 1980) and is the most common method used to measure corporate social responsibility disclosures (Milne and Adler, 1999). Content analysis has been extensively used by a

number of researchers within CSR studies (see, Guthrie and Parker, 1990; Gray et al., 1995; Adams et al., 1998; Deegan and Gordon, 1996; Hakston and Milne, 1996; Milne and Adler, 1999; Imam, 2000; Belal, 2001; Ghazali, 2007; Said et al., 2009, Abdullah et al., 2011).

Content analysis refers to the “method of codifying the text (or content) of a piece of writing into various groups (or categories) depending on selected criteria” (Weber, 1988). It was defined by Abbott and Monsen (1979) as, “a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity.” Krippendorff (1980) suggested numerous advantages for using content analysis. First, data can be accepted by a researcher in various forms, such as company websites, press releases, and annual reports. Second, by using content analysis, the researcher can investigate the number of times that a particular phenomenon occurs, as well as, the underlying meaning or context of the material being examined. Finally, using content analysis allows the researcher to analyse a large number of data. Krippendorff (1980) proposed a number of stages to follow in content analysis:

1. Identify the question (s) to be investigated
2. Determine the sampling units
3. Determine and define content categories
4. Determine the recording unit
5. Determine the coding mode
6. Test coding on a sample of text
7. Assess reliability and validity

After determining the sampling units, the next stage in content analysis is the development of categories into which data capture units can be classified. Determining and selecting the categories of CSR is an essential stage in the content analysis method (Milne and Adler, 1999). A number of steps have been taken in order to develop the CSR checklist which including themes and items of disclosure. As a starting point, a preliminary CSR checklist that contains themes and items were prepared and selected based on the previous studies that examined CSR disclosure practices, such as Hackston and Milne (1996), Ahmad et al. (2003), Haniffa and Cooke (2005), and Said et al. (2009) and more importantly those prior studies that have been conducted in Jordan (e.g. Abu-Baker and Naser, 2000; Suwaidan et al., 2004; Ismail and Ibrahim, 2008) in order to ensure their applicability to the Jordanian business environment. As a result, a preliminary checklist of five themes and 40 disclosure items was developed.

Second, all disclosure checklist were then tested for content validity through a panel of expert judges which have been asked to refine the checklist of CSR disclosure items. However, the content validity of CSR instrument will be presented in detail in the end of this section. The checklist was then updated and checked and reviewed against any new regulation related to disclosure requirements to ensure that the disclosure checklist reflects the disclosure practices and meet the disclosure requirements during the examined period.

As result of the above steps, the final CSR checklist consists of five themes, namely community involvement, employee information, environmental information and

product or service information, these themes are further broken down into 36 items as shown in Appendix B

4.5 MEASUREMENT OF VARIABLES

4.5.1 Dependent Variable

The third stage of the content analysis method is to identify the method of measuring disclosure (Unerman, 2000). There are two methods used to measure the CSR disclosure. First, the quantity of CSR disclosure which refer to the extent or level of pieces of information disclosed. Second, the quality of CSR disclosure which, refer to the qualitative of the information in term of diverse classification (such as, good/bad, forward-looking/historical, monetary/nonmonetary, quantitative/declarative) in order to meet users needs (Botosan, 2004). The main different between disclosure quantity and quality is based on the score disclosure items. In disclosure quantity, each disclosure item is equally weighted, while items have unequal importance in disclosure quality. The current study focuses on investigating the quantity of CSR disclosure. This is because the quantity of CSR disclosures may reflect the disclosure's quality (Deegan and Gordon, 1996) with little difference between CSR quality and the quantity (Gunawan, 2010).

Different methods have been suggested for measuring the quantity of CSR disclosure ; either through the amount or volume of disclosures (Gray et al., 1995; Darus et al., 2009; Alawi and Rahman, 2011), or through a disclosure index (Ghazali, 2007; Lim et al., 2008; Abdul Razak and Mustapha, 2013), or both (Haniffa and Cooke, 2005). This

study adopts both methods in order to provide a complete picture of the statue of CSR in Jordanian companies. Measuring disclosure volume provides a richer data set (Gray et al., 1995), and measuring CSR by disclosure index better captures the variety and nature of disclosure items. Another reason to use both measurements is to avoid the limitation of using a single method. For example, employing disclosure volume only ignores important information contained within photographs, graphs, or charts. Similarly, solely using the disclosure index by adopting a dichotomous procedure considers the disclosure item equal whether a company makes one disclosure or many disclosures and as such, this method is unable to determine the amount of item disclosure within a category and between companies (Hackston and Milne, 1996). However, the current study focuses on investigating the quantity of CSR disclosure. This is because the quantity of CSR disclosures may reflect the disclosure's quality (Deegan and Gordon, 1996) with little difference between CSR quality and the quantity (Gunawan (2010).

Different methods of measuring CSR by disclosure volume include measurement by number of words (Deegan and Gordon, 1996), measurement by sentences, (e.g., Hackston and Milne, 1998; Milne and Adler 1999; Ahmad and Sulaiman, 2004), or by page (see for example, Gray et al., 1987; Haron et al., 2004; Abu-Baker and Naser, 2000). In this study, the "number of sentences" is employed to measure the volume of CSR, because the number of sentences can be better justified (Hackston and Milne, 1998), and done with less use of judgment (Unerman, 2000). Furthermore, less quantification errors occur when using the number of sentences method, compared to the number of words (Milne and Adler, 1999).

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This method overcomes problems in other studies that measured pages or words. Using the number of pages is inaccurate due to different print, column, and page sizes from one annual report to the next (Hackston and Milne, 1996). In addition, using pages decreases reliability (Weber, 1988) because some information may be lost (Gray et al., 1995). This will make it difficult to compare between the two reports. In terms of the number of words, Haron et al., (2004) argued that measurement in terms of words is difficult, because words do not give any meaning without a sentence to provide content (Milne and Adler, 1999). Accordingly, this study employs the number of sentences to determine the level of disclosure. According to Hackston and Milne (1998), using sentences may overcome the problem of proportion of pages and avoid the need to account or standardize the number of words. Even though the number of sentences was seen as the most appropriate, using sentences ignores important information contained within photographs, graphs, or charts.

In order to capture the amount or volume of CSR disclosure, the first step before coding was to scan the annual reports for a primary understanding about the nature and location of items. Then, the annual reports were read carefully in order to assign each CSR item in the annual report to one of the checklist items. A copy of the checklist items form was prepared and used for recording data from the annual reports for each company and for each year. Each company has its checklist items (scoring sheet) including detail about company name, year of annual report and market type (first or second market). In addition, checklist items consisted of all items and themes used in this study. The recording of information disclosure was performed by ticking the relevant items in the checklist. Every sentence disclosed by the company

containing information related to a particular item was ticked in the checklist as one score or point, and then all scores related to this item were counted manually. For example, if the item “environmental protection” is mentioned in five sentences in the annual report for company X, every sentence will receive one tick, meaning that this item will receive a score of five in the checklist. After that, the data of the checklist forms for each company is transferred to an Excel data sheet in order to generate sums of scores for each disclosure theme as well as for total CSR disclosure scores. To compute the volume or amount of CSR disclosure for a company, the total number of sentences related to each item is counted and added together.

A dichotomous procedure is applied to determine the CSR disclosure index where a score of “1” is given if an item is disclosed and “0” if not. The CSR disclosure index for a company score is calculated as a ratio of the actual score awarded for the company divided by the maximum possible score (Haniffa and Cooke, 2005; Ghazali, 2007; Barako and Brown, 2008; Said et al., 2009; Khan, 2010). The number of disclosure items in this study is 36 representing the maximum disclosure score as illustrated in the formula below:

$$\text{CSRRI} = \frac{\text{Total disclosure of company (i)}}{\text{Total maximum disclosure score (36)}}$$

There are two methods to score disclosure items, namely weighted and un-weighted. The un-weighted method means that each disclosure item is equally weighted. In other words, all information items have the same degree of importance for all users. In contrast, the weighted method assumes that all items have unequal importance and is therefore based on a subjective importance of information items to the users. For example, the researcher used a five point Likert scale for items, where a score of 1 is an unimportant item, 2 is a little important, 3 moderately important, 4 important, and 5 is very important. However, using the weighted method has been criticised in other studies such as Khan (2010), as it was argued that using this method may lead to bias in the results, because from time to time, there are differences in assigning the importance of an item, from company to company and industry to industry. As such, the un-weighted method was used in this study to determine the level of CSR, because the concern was with all users, rather than user groups.

Assessing the reliability and validity is the last stage in content analysis, and should be considered in order to assess the goodness of a measuring instrument. Reliability concerns on accuracy of measurement refer to the possibility of achieving similar results on repeated trials by employing the same measurement. In other words, the reliability of a measure is without bias (error free) and thus is consistent over time and stable over a variety of conditions (Sekaran, 2003). Validity concern on whether we are measuring the right thing refers to the extent to which any instrument, technique or process is used to measure what it is intended to measure (Sekaran, 2003).

In order to assess for reliability and validity, the study applies a numbers of procedures and analyses.

1. To ensure the content validity of CSR measurement, a panel of expert judges were identified and selected based on their knowledge and expertise including two academics who have experience in conducting studies in CSR, and one auditor with expertise in Jordanian companies and a member of the Jordanian Association of Certified Public Accountants (JCPA) were asked to refine the checklist of CSR disclosure items to ensure that the measuring instrument is representative of a set of items that capture and reflect all the aspects of disclosure practices for Jordanian companies. A copy of the preliminary checklist was sent to each reviewer to check the disclosure checklist item by item and remove any inapplicable items to ensure that all items in checklist are applicable to the Jordan context. We also asked them to suggest new items they thought useful and relevant for this study. Resulting from this revision, a number of items were added to the checklist such as “Awards for environmental protection” and “Islamic CSR” while other items were omitted from the listed such as “Recycling”, since it does not take place in Jordan, and there are a limited number of recycling programs and initiatives which are undertaken only by the government.

2. Test-retest reliability performed to assess stability. Stability is a form of reliability and refers to the ability of researchers to code data in the same way and obtain similar scores over time (Milne and Adler 1999). In this study, the analysis of annual reports consists of 20% of the sample population, which is re-examined three weeks after the first round. The correlation coefficients between the first and second rounds is .96 for CSRDI and .91 for CSRDA, and significant at the 0.01 level (see, Appendix C). This result confirms the stability of the research instrument.

3. Cronbach's alpha test was employed to assess the internal consistency of CSR disclosure. Internal consistency refers to the degree to which the items in a test measure the same construct (Khan et al. (2012). The Cronbach's alpha coefficient ranges between 0-1. The closer Cronbach's alpha values is to one, the greater the internal consistency and reliability (Sekaran, 2003). A Cronbach's coefficient with the values of 0.60 to 0.70 is considered acceptable (Hair et al., 2010). However, the Cronbach's coefficient alpha in this study for the five themes is around 0.72 for (CSRDI measure) and .70 for (CDRDA measure) (see Appendix O). This result indicates good internal consistency compared to other studies such at the alpha values of 0.51, 0.63 and 0.70 found in the studies of Gul and Leung (2004), Rahman and Bukair (2013), and Khan et al. (2012).

4.5.2 Independent Variables

The independent variables examined in the current study consist of two groups. The first group is board diversity characteristics, which comprise of four variables: independence, age, gender and nationality directors. The second group consists of four variables related to corporate governance mechanisms: role duality, multiple directorships, and family members on the board and audit committee. Table 4.4 summarises the measurement of all variables examined in this study.

Board diversity characteristics

1. Gender diversity

Gender diversity refers to the presence of female directors in corporate boards of directors. The measure of gender diversity in this study is the ratio of women directors to the total number of directors on the board. This is similar to the measurement used by other studies (Wang and Coffey, 1992; Williams, 2003; Baraka and Brown, 2008; Bernardi and Threadgill, 2010; Khan, 2010; Zhang et al., 2012).

2. Nationality of directors

Nationality of directors are measured as the ratio of non-Jordanian directors to total number of directors on the board. The same measure was used by previous studies that measured foreign board members as a proportion of foreigners on the board. For instance, Barako and Brown (2008) measured non-Kenyans, and Khan (2010) measured non-Bangladeshis. However, this study focuses only on the nationality of directors and avoids using measurements such as the proxy of ethnicity and culture.

3. Independent directors

Independent directors were described by the Jordanian governance code as “a member of the board of directors who is independent of management and shareholders or relationship relatives to the company that may be suspected to bring that member benefit”. Similar to previous studies (Lim et al., 2008; Said et al., 2009; Sahin et al., 2011 and Htay et al., 2012), independent directors is measured as the ratio of the number of independent directors to the total number of directors.

4. Age diversity

Younger board members are used in this study as proxy of age diversity. Age diversity was computed as a ratio of young board of directors to total number of directors on the board. The young directors in this study are defined as those who are younger than 40 because, the age of young people generally ranges between 20 to 40 years according to Erik Erikson's stages of human development. Furthermore, age discrimination in employment in some countries such as the USA indicated that younger employees are under 40 (Feder, 2010). Similarly, the ministry of labour in Jordan defined young people in the labor market as those who are younger than 40 (DOS, 2011).

Corporate governance characteristics

5. Role duality

Role duality means that the chair of the board of directors and the CEO positions are held by the same person. Role duality is measured as a dummy variable, which takes a value of 1 if the CEO and chairman are the same person and 0 if not. This is similar to the measurement used by previous studies (Buniamin et al., 2008; Khan et al., 2012; Al-Janadi et al., 2013; Abdul Razak and Mustapha, 2013; Mohamed and Faouzi, 2014).

6. Multiple directorships

Multiple directorships refer to the directors who sit on more than one board. Similar to Haniffa and Cooke (2005) and Azman & Kamaluddin, (2012), the measure of

multiple directorships in this study is a dummy variable with the value of 1 if the chairperson has multiple directorships and 0 otherwise.

7. Family members on the board

Similar to previous studies (Ho and Wong, 2001; Darus et al., 2009; Al-Shammari and Al-Sultan, 2010), family members on the board is measured using the ratio of family members on the board to the total number of directors. However, the family members in this study refer to family member on the board who have a substantial equity holdings.

8. Audit committee

The corporate governance code in Jordan requires companies to establish audit committees with at least two members being independent directors. In this study, the audit committee is measured by the proportion of independent members. This is similar to the measurement used by other studies (Said et al., 2009; Al-Janadi et al., 2013; Gantjowati and Nugraheni, 2014)

Moderating variable

Board size

Board size refers to the number of members on the board. Similar to previous studies (Buniamin et al., 2008; Said et al., 2009; Ali and Atan, 2013; Abdul Razak and Mustapha, 2013), board size is measured by the total number of directors on the board.

Control variables

1. Firm size

Firm size has been measured by a number of different measures in the disclosure literature such as number of employees, total asset, turnover, market capitalisation, and total sale. There is no theoretical justification for a particular measure of size in disclosure studies. Hackston and Milne (1996) found that there was not much difference to measuring firm's size by using different measurements. In this study, the natural logarithm of total assets is used to measure the firm's size. Total assets was widely used in prior literature (Hackston and Milne, 1996; Ho and Wong, 2001; Webb, 2004; Gul and Leung, 2004; Branco and Rodrigues, 2008; Barako et al., 2006; Cheng and Courtenay, 2006; Said et al., 2009; Jo and Harjoto, 2011).

2. Profitability

Profitability is measured using return on assets (ROA) which has been widely used in the previous studies (such as, Webb, 2004; Bear et al., 2010; Sahin et al., 2011), which is calculated as the ratio of net profit to total assets.

Table 4.4 Measurements of the Variables

Variable	Acronym	Measurement
Dependent Variable		
CSR disclosure index	CSRDI	Ratio of the actual score awarded for company divided by the maximum possible score
CSR disclosure amount	CSRDA	Total number of sentences
Independent Variables		
Gender diversity	GEND	Ratio of women directors to total number of directors on the board
Independent directors	IND	Ratio of the number of independent directors to the total number of directors
Age of directors:	AGE	Ratio of young board of directors to total number of directors on the board
Nationality of directors	NAT	Ratio of non-Jordanian directors to total number of directors on the board
Role duality	RODU	Dummy variable, which takes a value of 1 if the CEO and chairman are the same person and 0 otherwise
Multiple directorships	MD	Dummy variable, where, 1= chairperson with multiple directorships and 0 = otherwise
Family members on the board	FMOB	Ratio of family members on the board to the total number of directors
Audit committee	AUD	Proportion of independent members of audit committee
Moderating variable		
Board size	BOSIZ	Number of directors on the board
Control variables		
Firm size	SIZ	Natural logarithm of total assets
Profitability	PRO	Return on assets

4.6 RESEARCH MODEL

4.6.1 Ordinary Least Square (OLS)

Ordinary Least Square (OLS) is the appropriate and powerful statistical technique, when there is a single dependent variable and a number of independent variables. This study used an OLS regression model to examine the relationship between independent variables (i.e., independence, age, gender and nationality directors, role duality, multiple directorships, and family members on the board and audit committee), and the dependent variable (i.e., social disclosure level). The regression models in this study are based on the two following measures.

Model 1

$$CSRDi_{it} = \beta_0 + \beta_1 INDi_{it} + \beta_2 AGEi_{it} + \beta_3 GENDi_{it} + \beta_4 NATi_{it} + \beta_5 RODUi_{it} + \beta_6 MDi_{it} + \beta_7 FMOBi_{it} + \beta_8 AUDi_{it} + \beta_9 SIZi_{it} + \beta_{10} PROi_{it} + \epsilon_{it}$$

$$CSRDAi_{it} = \beta_0 + \beta_1 INDi_{it} + \beta_2 AGEi_{it} + \beta_3 GENDi_{it} + \beta_4 NATi_{it} + \beta_5 RODUi_{it} + \beta_6 MDi_{it} + \beta_7 FMOBi_{it} + \beta_8 AUDi_{it} + \beta_9 SIZi_{it} + \beta_{10} PROi_{it} + \epsilon_{it}$$

4.6.2 Moderated Multiple Regression (MMR)

This study employs a moderated multiple regression (MMR) analysis to examine the moderating impact of board size (moderating variables) on the relationship between corporate governance and board diversity (independent variables) and the level of CSR disclosure (dependent variable). MMR analysis is an appropriate statistical

technique method for detecting and testing the effects of the moderating variables (Aguinis, 1995). To test the moderation effect, Moderated Multiple Regression consists of two steps (see, Aguinis, 1995; Alawi and Rahman, 2011). In the first step, the dependent variable regressed with the independent variables and moderator variable (without interaction term) as presented in the model (2).

Model 2

$$\text{CSRDI}_{it} / \text{CSRDA}_{it} = \beta_0 + \beta_1 \text{IND}_{it} + \beta_2 \text{AGE}_{it} + \beta_3 \text{GEND}_{it} + \beta_4 \text{NAT}_{it} + \beta_5 \text{RODU}_{it} + \beta_6 \text{MD}_{it} + \beta_7 \text{FMOB}_{it} + \beta_8 \text{AUD}_{it} + \beta_9 \text{BOSIZ}_{it} + \varepsilon_{it}$$

The second step creates new variables by interaction term between moderating and independent variable (independent \times moderator variable) and adds to the previous model as shown below:

Model 3

$$\begin{aligned} \text{CSRDI}_{it} / \text{CSRDA}_{it} = & \beta_0 + \beta_1 \text{IND}_{it} + \beta_2 \text{AGE}_{it} + \beta_3 \text{GEND}_{it} + \beta_4 \text{NAT}_{it} + \beta_5 \\ & \text{RODU}_{it} + \beta_6 \text{MD}_{it} + \beta_7 \text{FMOB}_{it} + \beta_8 \text{AUD}_{it} + \beta_9 (\text{IND}_{it} * \text{BOSIZ}_{it}) + \beta_{10} (\text{AGE}_{it} \\ & * \text{BOSIZ}_{it}) + \beta_{11} (\text{GEND}_{it} * \text{BOSIZ}_{it}) + \beta_{12} (\text{NAT}_{it} * \text{BOSIZ}_{it}) + \beta_{13} (\text{RODU}_{it} \\ & * \text{BOSIZ}_{it}) + \beta_{14} (\text{MD}_{it} * \text{BOSIZ}_{it}) + \beta_{15} (\text{FMOB}_{it} * \text{BOSIZ}_{it}) + \beta_{16} (\text{AUD}_{it} \\ & * \text{BOSIZ}_{it}) + \varepsilon_{it} \end{aligned}$$

Where,

CSRDI	= Corporate social responsibility disclosure index
CSRDA	= Corporate social responsibility disclosure amount
IND	= Independent directors
AGE	= young directors
GEND	= Women directors
NAT	= Non-Jordanian directors
RODU	= CEO duality
MD	= Chairperson with multiple directorships
FMOB	= Ratio of family members on the board to the total number of directors
AUD	= Proportion of independent members of audit committee
BOSIZ	= Board size
Size	= Size based natural logarithm of total assets
PRO	= Profitability based on return on assets
$\beta_0 - \beta_{16}$	= Regression coefficient
ε	= Error term
t	= Represents time dimension (year)
i	= Represents cross section dimension (firm)

4.7 PANEL DATA ANALYSIS

This study used panel data analysis to test the hypotheses and to investigate the influence of board diversity and corporate governance characteristics on the level of CSR disclosure. Panel data has been applied by previous studies. For example, Htay et al. (2012) used panel data to identify the impact of corporate governance on CSR disclosure in Malaysian banks over the 1996-2005 period. Saleh et al. (2011) used

panel data analysis to test the relationship between CSR and institutional ownership for 200 companies listed on the main board of Bursa Malaysia over the 2000-2005 period. Similarly, Mohamed and Faouzi (2014) employed panel data analysis to test the link between corporate governance and the level of voluntary environment disclosure for 23 companies listed on Tunis Stock Exchange from 2003 to 2011. This type of analysis is the most appropriate methodology for the current study since this study consists of both cross sectional (companies listed in ASE) and time series data (years between 2007 to 2011).

Panel data, or longitudinal data also known as cross sectional time series data, refers to the data on individual units observed in different times (Hsiao, 2003). Panel data contains two dimensions: a cross sectional dimension N (entities or subjects e.g., countries, firms, or individuals), and a time series dimension T (e.g., year and month). Panel data can also be divided into micro or macro data. Micro panel data or short panel occurs when the number of time periods is less than the cross section ($T < N$, Small T and Large N), while, macro panel data or long panel occurs when the number of time period is greater than the number of cross sectional ($T > N$, Large T and small N). In this study, micro panel data used since the data contain four years (short time period) and 117 companies (large cross sectional). However, it is important to take into account the nature of data set in panel analysis in terms of either balanced or unbalanced data. In balanced panel data, each company in the data set is observed in the same number of times periods, whilst unbalanced panel occurs when company in the data set may be observed in different numbers of times (Greene, 2008). However, balanced panel data has been used in this study because the data are balanced.

Several scholars employed panel data methodology to examine issues that are unable to be studied in either time-series or cross-sectional settings alone (Greene, 2008). Panel data provides many advantages as discussed in Hsiao (2007), Gujarati (2003), and Baltagi (2005).

First, Panel data increases the sample size due to a larger number of observations as result of accounts for multiple observations (N) over multiple time periods (T) which results in a total number of observations (N*T) and provides more informative data. This will improve the efficiency and reliability of econometric estimates because panel data leads to increased degrees of freedom and less collinearity among variables. **Second**, panel data has the ability to control individual heterogeneity and omit unobserved or mismeasured variables. As such, it is important to control it to avoid any bias in the resulting estimates. **Third**, panel data are more able to study the dynamics of change (such as, job turnover, spells of unemployment), and complicated behavioural models (such as, economies of scale and technological change) rather than pure time-series and cross-sections.

As earlier mentioned, panel data takes into account the individual behaviour for cross sectional as well as cross time. The following is the basic panel model commonly used.

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$

Where:

Y_{it} : dependent variable.

α : vector of intercept.

β : vector of coefficients.

X : vector of independent variables

ε : error term,

i : represents cross sectional dimension (e.g. countries, firm)

t : represents time series dimension

Different types of panel data models are used to estimate the data including pooled ordinary least squares model (pooled OLS), fixed effects models (FEM) and random effects models (REM). These models depend on the assumptions of intercept, the slope coefficients, and the error term.

1. Pooled ordinary least squares model (pooled OLS)

Pooled OLS is also known as the constant coefficient model (CCM). This model is considered the simplest model. The model assumes that the regression coefficient's intercept and slope are constant and equal for all cross sectionals (companies, countries, individual). In other words, this model ignores the individual effect or heterogeneity across units (Greene, 2008). Despite the simplicity of this model, it is the most restrictive among the other models due to several assumptions. For example, if the model meets the following assumptions then OLS is the consistent and efficient estimator (Greene, 2008 and Wooldridge 2002).

1. Homoscedasticity
2. No autocorrelation

3. Linearity
4. No multicollinearity problem
5. Disturbances are not correlated with any regressors (Exogeneity)
6. Normal distribution

Baltagi (2005) stated that the model is the same as the OLS regression but with double subscripts i for cross-sections and t for time-periods. Gujarati and Porter (2009) pointed out that the pooled OLS model can be treated as usual OLS regression because this model ignores the cross sectional and time dimensions of the pooled data.

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$

Where,

Y_{it} : is the dependent variable ,where i = firm and t = time.

X_{it} : independent variable

α :is the intercept

β : is the coefficient

ε_{it} : is the error term

2. Fixed Effects Model (FEM)

This method assumes that each company has a constant slope coefficient but different intercept. The difference in the intercept is due to the fact that each company or unit has its own individual characteristics such as managerial style and philosophy (Gujarati, 2003). The intercept varies across individuals or companies but not over

time (time invariant), which means that this method removes or controls the effect of unobserved time-invariant (Allison, 2009). FEM is an appropriate model in cases when the intercept is correlated with the independent variables (repressors). However, in order to consider the varying intercept across individual or company is to employ either the dummy variables method or mean deviation method. The dummy variables method or Least Square Dummy Variable (LSDV) method is employed by creating a number of dummy variables for each companies. Gujarati, (2003) stated that the use of this method causes problems (especially when number of companies, N , is very large) such as the possibility of multicollinearity and reduces the degrees of freedom since many dummy variables will be used (Gujarati and Porter, 2009). The fixed effects model is represented as follows:

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it}$$

Where,

Y_{it} :is the dependent variable, where i = firm and t = time.

X_{it} : independent variable

α_i :is the intercept

β : is the coefficient

ε_{it} :is the error term

3. Random Effect Model (REM)

This model is also known as the Error Components Model (ECM). The assumption underlying the use of this model is that individual effect is not correlated with any

independent variables and allows for time-invariant variables (Greene, 2008). In this model, slopes remain the same across company as in the fixed effect model. The difference is in the individual specific effect (unobserved heterogeneity) whereby FEM assumes to be part of the intercept model while REM assumes random variables as part of the composite error term (Gujarati and Porter, 2009). The difference between FEM and REM models are shown in Table 4.5 below:

Table 4.5 Fixed Effect and Random Effect Models

	Fixed Effect Model	Random Effect Model
Functional form	$Y_{it} = (\alpha + u_i) + X_{it}\beta + v_{it}$	$Y_{it} = \alpha + X_{it}\beta + (u_i + v_{it})$
Assumption	-	Individual effects are not correlated with regressors
Intercepts	Varying across group and/or time	Constant
Error variances	Constant	Randomly distributed across group or time
Slopes	Constant	Constant
Estimation	LSDV, within effect estimation	GLS, FGLS (EGLS)
Hypothesis test	F test	Breusch-Pagan LM test

Source :Practical guides to panel data, Park(2010)

A random effect model is usually estimated by generalised least squares (GLS) since OLS estimators will be inefficient (Gujarati and Porter, 2009). It can estimate FEM as follows

$$Y_{it} = \alpha + \beta X_{it} + w_{it}$$

Where,

Y_{it} :is the dependent variable ,where i = firm and t = time.

X_{it} : independent variable

α :is the intercept

β : is the coefficient

w_{it} : composite error term. $w_{it} = u_{it} + v_i$. Where, v_i = unobserved individual effect. u_{it} : the remainder error term(regular error term)

4.8 DIAGNOSTIC TESTS

4.8.1 Normality

Normality is one of the main assumptions of multiple regression analysis and refers to the shape of the data distribution for the variables that assume to be normally distributed. Ghasemi and Zahedias (2012) stated that non normality for the data leads to invalid and unreliable results. Normality can be tested by numerical methods (such as, Shapiro-Wilk test, Kolmogorov-Smirnov test and skewness and kurtosis) and graphical methods (such as, histogram, density estimate, Q-Q plot, and boxplot and P-P plot).

Numerical and graphical methods are used in this study to check the normality. For Numerical methods, skewness and kurtosis are the most commonly used to tests the normality among other methods such as the Kolmogorov-Smirnov test, which has been found to have low power properties (Ghasemi and Zahediasl, 2012). The current study uses skewness and kurtosis to test for normality.

Skewness measures the degree and direction of asymmetry data. It reflects the balance of the distribution (centred, shifted to the left or right). If skew is zero, then the distribution is normal. Right skewed (long right tail) indicates a positive skew value, while left skewed indicates a negative skew. The data is considered to have normal distribution if skewness values fall outside the range of -1 to +1 (Hair et al., 2010). Others suggest ± 1.96 (Haniffa and Hudaib, 2006) and ± 3 (Kline, 1998). Kurtosis refers to the degree of peakedness or flatness of the distribution. When the peakedness is high, this indicates a positive kurtosis, and when the flatness is high, this indicates negative kurtosis. A good kurtosis value is within the range of -2.0 to +2.0 (Coakes and Steed, 2003).

Another method employed in this study to check for normality is graphical methods that include a histogram and density estimate of the distribution of the residuals that assume a normal curve. In addition, P-P plot of regression of standardized residuals is used and all observed values are assumed to fall along the straight line.

4.8.2 Multicollinearity

Multicollinearity occurs when there is a high correlation among two or more independent variables in the regression model. The presence of multicollinearity will effect the interpretation of the results and estimation of the model. Kumari (2008) stated that when multicollinearity exists then it will be difficult to estimate the individual effects of the independent variables and the result will become less reliable. In other words, it will be difficult to explain which independent variable is influencing

the dependent variable. El-Dereny and Rashwan (2011) pointed out that the Multicollinearity problem has several effects such as: drop some important variable from model, estimated coefficients may have wrong signs, and reduces the precision of estimation due to high variance of coefficients .

To check for multicollinearity, two tests are employed in this study. The first test is based on the correlation coefficients matrix. The degree of correlation should not be more than 0.80 (Gujarati, 2003; Field, 2005). If it exceeds 0.80, this will indicate a high degree of correlation and causes multicollinearity problems. Some studies suggest that correlation should not be more than 0.90 (e.g. Field, 2005). The second test applied to check for multicollinearity is the Variance Inflation Factor (VIF). The VIF is equal to $1 / (1 - R^2)$, where R^2 is the coefficient estimated by regressing each independent variable to all other independent variables (Suwaidan, 1997). If the VIF value exceeds 10, this indicates a potential problem of multicollinearity (Neter et al., 1983; Gujarati, 2003; Field, 2005). Moreover, multicollinearity exists if the tolerance is $(1/VIF)$ less than 0.10 or 0.20 (Field, 2005).

To solve multicollinearity problem, two common methods are available. First, drop one variable from the model, but in this case we should consider the importance of the variables in order to remove the less important one. Second, use the centring and standardizing approach suggested by Aguinis (1995). Under this approach, the problem can be avoided by transforming the variables to Z scores that have mean zero and standard deviation one. This approach is commonly used when generating a new variable.

4.8.3 Linearity

The assumption of linearity states that the model must have linear parameters. This means that the relationship between the dependent and independent variables should be linear. Outliers occur when there are extreme values that are substantially different from other observations on either the independent variables or dependent variables or both. The outlier problem may effect on mean, variance and regression coefficients. Bohrnstedt and Knoke (1982) suggest three situations to deal with outlier problem. First, drop an outlier from the analysis because the problem may come from data entry errors or observation errors. Second, keep the outlier in the analyses especially if it is considered an important observation. Third, accommodate the problem by using data transformations or robust regression. However, Hair et al. (2006) stated that non-linearity is not a problem and it is a common in the majority of disclosure studies (Cooke, 1998). This may refer to the high gap of CSR disclosure level among companies which result from different characteristic such as the firm size and industry type and ownership structure. The current study uses scatter plots to check for outlier problem or linearity assumption.

4.8.4 Heteroskedasticity

Homoscedasticity is one of the main assumptions of the linear regression model. Under this assumption, the variance of the error term is constant for all observations. In this case, if the variance of the disturbance term is non-constant and differs across observations, this is known as heteroskedasticity (Greene, 2008). Heteroskedasticity is often found in cross-sectional data. The OLS estimate under heteroskedasticity is still unbiased and consistent but not efficient and is no longer a best linear unbiased

estimator (BLUE) (Gujarati and Porter, 2009). This is because when heteroskedasticity is present then the standard errors of the estimate will be biased causing the t-statistics and p-value to be biased (Baltagi, 2005).

Several tests have examined the presence of heteroskedasticity such as the White test (1980), Breusch-Pagan/Cook-Weisberg test (1979), Goldfeldt-Quant test (1965) and the modified Wald statistic. Several ways suggested to deal or remedy the heteroskedasticity problems include specifying the model or transforming the variables. Second, use weighted least squares (WLS). Third, use robust standard errors. The latest one is a more common and trustworthy method to deal with heteroskedasticity. Robust standard errors deal with the problem of errors that are not independent without changing the coefficient estimates but changing the standard errors and significance tests (Gujarati and Porter, 2009). Thus, the test statistics will give reasonably accurate p values. Other methods such as WLS is more difficult to implement because it requires more assumptions.

4.8.5 Autocorrelation

The classical linear regression model (CLRM) assumes no autocorrelation between the disturbances. Autocorrelation or serial correlation indicates that error terms are correlated across observations in time series data or in cross-sectional. Thus, the covariance of disturbances are not zero. However, autocorrelation is often found in time-series rather than in cross-section studies (Baltagi, 2005). The OLS estimator is affected by the presence of autocorrelation problem. However, the OLS remains unbiased and consistent but is no longer efficient (Gujarati and Porter, 2009). In

addition, t -statistics and standard errors become invalid because serial correlations result in smaller standard errors and a larger t statistic. Moreover, the R^2 tends to be too large (Wooldridge 2002). It is clear that the problems caused by autocorrelation seem to be caused by heteroscedasticity, but are more likely to influence the OLS estimator (Greene, 2008).

A number of methods used to test the problem of autocorrelation have been proposed in the literature such as Breusch–Godfrey (BG) test, Durbin–Watson d test and Wooldridge’s test. However, the current study uses Wooldridge’s test, which is a new test discussed and derived by Wooldridge (2002). Wooldridge’s test is easy to implement and flexible since it requires a few assumptions and can be performed for a number of different cases (Drukker, 2003). As in the heteroskedasticity problem, robust standard errors are also used as the most common way to deal with the autocorrelation problem.

4.9 DATA ANALYSIS SOFTWARE

This study uses statistical software STATA version 11 to run the regressions. This software is more specialised to analyse the cross-section, time-series and panel data. STATA is a powerful statistical package that is more suitable for panel data analysis compared to other software, through providing a number of statistical tools and a variety of options including a series of commands (such as, `xtreg`, `gmm`, `regress`, `xttest`, `xtregar`, `cluster`, `xtrc`, and `xtscc`) that are designed especially for panel data. Accordingly, this study used STATA to test the hypotheses and analyse the data. However, this study also used Statistical Package for the Social Sciences (SPSS) to

generate new variables by interaction term between the moderating and independent variables, and to transform the data along with other tests.

4.10 CHAPTER SUMMARY

This chapter discussed the research methodologies adopted for this thesis. Data collection was based on the annual reports of Jordanian companies. The study sample comprised of 117 companies the random selection from the first and second markets of the Amman Stock Exchange (ASE). This chapter also discussed content analysis in detail whereby the CSR checklist was developed based on prior CSR studies. The study adopted two measures of CSR disclosure, namely a total number of sentences and disclosure index. Un-weighted methods were used to score the disclosure items. Finally, this chapter explained panel data analysis as method used for data analysis. The findings and results of the analysis will be discussed in the following chapter (Chapter 5).