

An-Najah National University Faculty of Graduate Studies

THE IMPACT OF CORPORATE GOVERNANCE AND BOARD OF DIRECTORS CHARACTERISTICS ON CORPORATE FAILURE: SURVIVAL STATISTICAL PREDICTION BY R

By Duha Jamal Yousef Rabaia

Supervisors Prof. Dr. Abdul Naser Nour Dr. Muiz Abu Alia

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This Thesis was Defended Successfully on 01/08/2022 and approved by:

Prof. Dr. Abdul Naser Nour Supervisor

Dr. Muiz Abu Alia Co-Supervisor

Dr. Fadi Shihadeh External Examiner

Dr. Saed Koni Internal Examiner

Signature Signature Signature Signature

الإهذاء أهدِي ثَمرَة جُهدِي وَعلمي إلَى **جدَّتي الغَالية "أَم هيْثم**" - وُإِلَى كُلَّ الَّذِين أُحِبُهم-الَّى مَنْ أَيَّد ودَعَم مُرَبِّي الأَجيَال **جتِي الأُستاذ "محمد عبد الله النَّافع" جتِي الأُستاذ "محمد عبد الله النَّافع"** أهدِي النَّمرَة الأُولَى وَفاءَ وتَقَدِيراً و**الدي "أَبو المهدِي**"

وإلَى مُلهمتي الَّتي أَسيرُ بنُور دُعائِها

أُمي العَزيزة "أُم المهدي"

وإلمى أطباء المستقبل

أخوتي أميمة وأسماء ومهدي وعزالدين وعمر

وإِلَى كلِّ منْ علَّمني حَرِفاً وسَار علَى درْب العِلم وأخلَص النِّيَّة

وإِلَى الكِرَام أَوَلَاد الكِرَام الوَاقفِين للطائرات والدَّبَابات الواهِبين دمَ أَبنائِهم لَنَا كرَماً مَحْضاً وهديةً للهِ

وإلَى رُوح الأُستاذة رضوى عاشور الَّتي قالَت:

"هُناك احتمالٌ آخَر لتتوِيج مَسعانا بغَير الهَزيمة، ما دُمنا قرَّرنا أنَّنا لنْ نمُوت قَبلَ أنْ نُحاوِل أنْ نَحيَا"

الشكر والتقدير

"نِعْمَةً مِنْ عِنْدِنَا كَذَلْكَ نَجْزِي مَنْ شَكَرَ"

سورة القمر (35)

الحَمدُ والشُّكرُ لله الَّذي بشُكره تدُوم النِّعم، والصَّلاة والسَّلام على رسُولنا ومعلِّمنا الأوَّل مُحمَّد (ﷺ). اللَّهمّ لك الحمدُ حمداً كثيراً طيّباً مباركاً فيه أنْ أكرَمتني بإتمام أُطروحة الماجستير في تخصص المُحاسبة، وأسألك اللَّهُمَّ أنْ تقبل عِلمي وعَملي هذا خالصاً لوجهك الكربم وابتغاءً لرضَاك. ولا يسَعُني إلَّا أنْ أتقدَّم بجزبل الشُّكر والامتنان إلَى جامعةِ النَّجاح الوَطنية -مُمثَّلة بكليّة الدِّراسات العُليا وعميدها الدَّكتور وليد صوبلح-هذا الصّرح الأكاديميّ العَربِق والمَنارة العلميَّة التي لا تنطفِئ، الَّتي أتاحَت لي فُرصة نَيل الدَّرجة العلميَّة الثانية. واعترافاً منًا بفَضل ذَوِي الفَضل، الَّذين أحيُوا فينا شغَف العِلم والتَّعلُّم ونمُّوا فينَا روحَ البَذل والعَطاء فإنَّنى أشكُرُ كلّ منْ أسدَى إليَّ الجَميل بتقديم المُساعدة العلميَّة والمعنَويّة، وأخصّ بالذِّكر رئيسَ قسم المُحاسبة الأستاذ الدّكتور عبد الناصر نور والدّكتور معز أبو عليا اللَّذان تفضَلا بالإشرَاف على إعدادِ هذه الأُطروحَة ومُتابعتها وتقدِيم الإرشَاد والتَّوجيه، حتَى خرَجت بصُورتها النِّهائية، وأُسأَلُ الله لكُما العُمرِ المَديد ودَوام الصِّحة والعَافية. كَما وأشكُر رئيس وأُعضاء لَجنة المُناقشة المُحترمين؛ لِما تكبَّدُوه منْ عنَاء المُراجَعة والتَّقويم وأُخصُّ بالذِّكر الدّكتور سائد الكونى والدّكتور فادي شحادة، لكُما جزيل الشُّكر والاحترام، وجُودكما شرفٌ كبير وَيزيد البَحث قيمةً والمُناقشة ثراءً. وأتقدَّم بجزبل الشُّكر والعرفان للدّكتور إسلام عبد الجواد الَّذي أنار لَنا طريق البَحث العلميّ السَّليم مِن بداية الطَّريق في بَرنامج الماجستير . وكُل الشُّكر والتَّقدير للقامَة العلميَّة المُتميّزة وصَاحب الخِبرة والعَطاء الدّكتور كامل جبرين من قِسم الرّباضيات على توجيهَاته القيّمة ومُساهَمته في إتمام التَّحليل الإحصائيّ. والشُّكر موصُولٌ إلى كلِّ من أعانَني على إعداد هذه الأُطروحَة من أهلٍ وأصدقاءٍ ومُدرسين وزُملاء وأَخصُ بالذِّكر د. هدى السيد العربي، أ. سماح غسان، أ. هيثم محمد، م. وسام عمارنة. وفي الخِتام أسأَلُ الله أنْ يكون عَملي هذا مصباحاً يستنيرُ به أهلُ العلم والسَّائلين، ورِفعةً لشَأن بلدي فِلسطين، وفي ميزانِ حَسناتي يوم الرِّين، وآخر دَعوانًا أن الحمدُ للهِ ربّ العالَمين.

الباحشة: ضحى جمال ربايعة

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

THE IMPACT OF CORPORATE GOVERNANCE AND BOARD OF DIRECTORS CHARACTERISTICS ON CORPORATE FAILURE: SURVIVAL STATISTICAL PREDICTION BY R

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name:

Duha Jamal Rabaia

Signature:

Duha aig

Date:

01/08/2022

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THE IMPACT OF CORPORATE GOVERNANCE AND BOARD OF DIRECTORS CHARACTERISTICS ON CORPORATE FAILURE: SURVIVAL STATISTICAL PREDICTION USING R

Bv

Duha Jamal Rabaia Supervisors Prof. Dr. Abdul Naser Nour Dr. Muiz Abu Alia

Abstract

This study aims to predict corporate failure (CF) of the companies listed on the Palestine Exchange (PEX) and the Amman Stock Exchange (ASE) by means of a statistical method, using R. In addition, the study intends to examine the impact of corporate governance (CG) and board characteristics (BC) on CF.

The statistical method used in this study was survival analysis. RStudio was used to analyze the study data by applying the Cox hazard regression technique. The annual reports of a total of 96 companies from the industrial and service sectors were analyzed for the period between 2015 and 2019. More than 7200 observations were made in this study. Agency theory and upper echelons theory were the main theories used to explain the association among the study variables. The study found a significant negative association of board size, board independence, board age, board education, firm size, liquidity and profitability, considered together, and CF.

In contrast, for companies in the PEX – except for board age, which showed significant negative association with CF – there existed a significant positive association of CF with ownership concentration, board education and board activity. For ASE, there was a significant positive association between profitability and CF but a significant negative association of board size, board independence, board age, board education, firm size, liquidity and profitability with CF.

In general, the log-likelihood test result indicated that the CG and BC models are significant for the PEX and ASE. However, there was a significant difference between PEX and ASE regarding the impact of CG and BC on CF. Moreover, the statistical learning test suggested that liquidity, firm size, ownership structure, board age, board independence and profitability are the most important subset variables, in that order, to

predict CF. Finally, receiver operating characteristic (ROC) curve illustrated that the survival models as classifiers are ideal and have an accuracy equal to 0.84.

This study is expected to contribute to the literature in the field of accounting by providing an understanding of the association between CG and BC on one hand and CF on the other. Moreover, this study statistically predicts CF without relying on commonly used quantitative models for the purpose, such as Altman, Kida and Sherrod models. In addition, this study is one of the first ones to use RStudio in the field of accounting. Finally, it links behavioural science and accounting theories.

Findings assist investors to evaluate financially distressed firms on the basis of CG and BC. In addition, it will help decision-makers to improve the firm and avoiding risks that may lead CF. Also, be essential for regulatory authorities in formulating new policies regarding CG and BC. Moreover, this study is considered a model that encourages researchers to use the RStudio program in their research.

The study limitations are the difference between the size of PEX and ASE. As the size of the ASE is three times larger than the PEX. Thus, this leads to differences in the accuracy of the results, as the larger sample leads to results that are more accurate. In addition, the absence of an agreed index for evaluating CG practice compliance. Future studies are encouraged to study more factors that may be an effect on the CF especially under the influence of the Covid-19 pandemic. Another important suggestion is to use artificial intelligence in the prediction of CF in PEX and ASE.

Keywords: Corporate governance, Board of directors' characteristics, Corporate failure, RStudio

Chapter One General Framework

1.1 Introduction

Failure to survive is one of the most significant threats to a company. Failures may be caused by internal or external factors, particularly when managers seek to fulfil their own desires through financial manipulation and theft, which eventually put companies at risk of bankruptcy (Du Jardin et al., 2019). Many major companies such as Enron, WorldCom, Parmalat, Nortel and Tyco failed to survive and faced financial crisis due to inadequate and weak corporate governance (CG) and accounting fraud (Sorensen & Miller, 2017).

The last few decades have witnessed an increased interest in contemporary companies' CG practices. According to the agency theory, CG is defined as company activities and procedures aimed at mitigating the degree of conflicts arising from the distinction between ownership and management (agency problem). CG practices detailing the essence of the relationship between the corporate and key company constituencies can represent what are perceived to be the valid lines of accountability (Ofoeda, 2017). CG is a series of practices and management of business relationships between owners, suppliers, staff, distributors, stakeholders and the state (Lakshan & Wijekoon, 2012). The significance of CG relates to the preservation of the financial system. Today, governance is one of the foundations of the financial and regulatory changes adopted by many countries around the world. Good CG tends to establish a climate of trust, openness and accountability, which is fundamental to fostering long-term investment, financial stability and business sustainability as well as promoting greater development and more equitable communities (Organisation for Economic Co-operation and Development [OECD], 2019). In making management decisions, CG is a significant consideration and, thus, impacts a company's success (Fernando & Hou, 2019). The introduction of CG to a company is an assurance of the company's survival (Hileh, 2019). Furthermore, it enhance the transparency of financial statements prepared by a company (Arabiat et al., 2016).

On other hand, the behavioural science theories, such as upper echelons theory (Hambrick & Mason, 1984), theory of diversity (Harrison & Klein, 2007), human cognition theory (Campbell, 1960) and information processing theory (Ashby, 1956), stipulate an

important relationship between board characteristics (BC) and decision-making, which impacts the survival or failure of companies. Most previous studies depend on commonly used quantitative models, such as Altman, Kida and Sherrod models, for predicting corporate failure (CF).

1.2 Research Problem

In the last few decades, the business world has seen many cases of CF worldwide. Several factors have been proposed as reasons for these failures. Among them, the main reasons are operational risks (Aloqab et al., 2018), tough economic conditions (Russell & Zhai, 1996), ineffective board of directors and poor CG (John & Ogechukwu, 2018). In this context, the results of the previous empirical studies on the impact of CG and BC on CF are inconsistent. Moreover, most of the previous results focused excessively on only a few developed countries with a common structural context. Therefore, further studies are essential to demonstrate the impact of CG systems and BC on CF, particularly in the developing world.

Quantitative models have been extensively used to predict CF since 1968; the most famous model is the Altman model. Although it is the most popular model for predicting financial failure and researchers have conducted many updates for model, according to 2016 statistics, its reliability rate is only 75–90% (Ko et al., 2017). This model, therefore, lacks high accuracy in terms of forecasting CFs. This could be attributed to many reasons. The most important ones include the following: difficulties in collecting samples, importance of different variables, data instability, inaccurate classification and lack of generalizability in the modelling. Additionally, it is known that accurate prediction of CF requires a rigorous analysis based on accurate and diverse evidence (Ko et al., 2017). However, previous studies that predicted CF were limited to only clarifying the direction and strength of the variables and did not classify the variables according to their degree of importance. Although this clarification was accurate and transparent and increased the ability of decision-makers to identify errors and overcome them, recent study not only clarified ideal variables using artificial intelligence techniques but also categorized them on the basis of importance and accuracy. However, this study aims to predict the CF of the companies listed in the Palestine Exchange (PEX) and Amman Stock Exchange (ASE) by means of a statistical method, using R. In addition, it intends to examine the impact of CG and BC on CF. To clarify more, the idea of the research is to predict

financial failure based on statistical methods in the analysis that depend on the R programming environment, not by relying on traditional popular quantitative models, whose accuracy varies.

1.3 Research Importance

This study seeks to predict CF of the companies listed in the PEX and ASE by survival statistical prediction method, using R. In addition, it aims to examine the impact of CG and BC on CF. Empirical results on the BC and CG contribute in protecting the corporate from financial failure risks starting of financial default and eventually corporate's bankrupt. They also enhance the companies' survival in the market, which contributes to the general well-being and prosperity of the national economy.

This study makes various significant contributions. First, it predicts CF by means of statistical methods, instead of widely used quantitative models such as the Altman model. Second, it clarifies the importance of CG practices in preserving the survival of Palestinian and Jordanian companies. Third, it demonstrates the role of the characteristics and composition of the board of directors in preserving the companies and protecting them from CF. Fourth, the study supports the use of the R/RStudio package program in the accounting field, where R is considered one of the most powerful programming languages for statistical. The RStudio program is the best statistical program according to the 2020 statistics (Drasah, 2021). Fifth, this study is unique in its reliance on the survival methodology in the accounting field, which is widely used in medical research such as predicting the ability of a smoker to survive when receiving the Pfizer vaccine. Sixth, it used a statistical learning technique, one of the artificial intelligence-based techniques, to classify the important variables; here, it is noteworthy that artificial intelligence techniques are considered pioneers in modern and academic studies. Moreover, the study used the receiver operating characteristic (ROC) curve, which measures the accuracy of the model. Seventh, the study links behavioural theories and management theories such as Agency theory, Resource dependence theory, Upper echelon theory, Theory of diversity, Human cognition theory and information processing theory. Finally, as indicated earlier, this topic has not been studied in the context of developing countries; more specifically, there is a lack of such studies in the context of Palestine and Jordan, as per the researcher's knowledge. Therefore, the study bridges this gab in the literature.

1.4 Research Objectives

This study highlights the CG practices and BC in the context of CF. It aims to predict the CF of the companies listed in the PEX and ASE by means of a statistical method, using R. In addition, it intends to investigate the impact of CG practices, including board size, board independence, chief executive officer (CEO) duality, ownership structure, ownership concentration and audit committee, and BC, including board gender diversity, board age, board education and board activity, on CF in industrial and service companies listed in the PEX and ASE from 2015 to 2019. The specific objectives are presented below:

OA: To determine the impact of CG on CF.

OA1: To determine the impact of board size on CF.

OA2: To determine the impact of board independence on CF.

OA3: To determine the impact of CEO duality on CF.

OA4: To determine the impact of ownership structure on CF.

OA5: To determine the impact of ownership concentration on CF.

OA6: To determine the impact of the audit committee on CF.

OB: To determine the impact of BC on CF.

OB1: To determine the impact of board age on CF.

OB2: To determine the impact of the board's gender diversity on CF.

OB3: To determine the impact of board education on CF.

OB4: To determine the impact of board activities on CF.

Finally, it would be beneficial to differentiate between Palestine and Jordan with regard to the above-mentioned aspects. This consideration led to the following objective:

OC: To determine the differences between PEX and ASE regarding the impact of CG and BC on CF.

1.5 Research Questions

The following questions and sub-questions represent the research problem related to the impact of CG and BC on CF:

QA: What is the impact of CG on CF?

- QA1: What is the impact of board size on CF?
- QA2: What is the impact of board independence on CF?
- QA3: What is the impact of CEO duality on CF?
- QA4: What is the impact of ownership structure on CF?
- QA5: What is the impact of ownership concentration on CF?
- QA6: What is the impact of the audit committee on CF?
- QB: What is the impact of BC on CF?
- QB1: What is the impact of board age on CF?
- QB2: What is the impact of the board's gender diversity on CF?

QB3: What is the impact of board education on CF?

QB4: What is the impact of the board activities on CF?

QC: Are there differences between PEX and ASE regarding the impact of CG and BC on CF?

The rest of the thesis has been structured as follows: Chapter two presents the literature review, hypotheses and theoretical framework; chapter three discusses the research methodology, including data source, research sample, research model, variable measurement and research technique; in chapter four, the empirical results obtained after testing the hypotheses of the study are presented and discussed; chapter five provides an overview, a conclusion, originality/implications and limitations of the study, recommendations and scope for future study.

Chapter Two

Literature Review and Hypotheses Development

2.1 Introduction

This chapter provides an in-depth review of the extant literature on the relationships between the study variables and the theories that explain them. Moreover, it explains the concepts of CG, CF and BC as well as the related theories. Further, it develops the study hypotheses based on these related studies and theories.

2.2 Definition of the Concepts

This section defines the basic concepts this study revolves around such as CG, CF and R, based on information in previous studies and as per the regulations of specialized organizations and bodies.

2.2.1 Corporate Governance

The OECD has defined CG as a collection of relationships between a company's management, board, shareholders and stakeholders. CG also includes the mechanism based on which a company's objectives are set and that provides ways to meet those objectives (OECD, 2004). Improved CG provides the board and management appropriate resources to achieve goals that are in the company's and its shareholders' interests and promotes successful oversight (OECD, 2004). CG is formed by a set of principles, practices, laws, procedures and techniques that improve the way a company is regulated (Wankel, 2009). CG was first conceptualized in the Cadbury report – as a mechanism by which companies are governed and guided, concentrating primarily on the creation of a structure that can protect the interests of stakeholders (Report of the Cadbury Committee, 1993). Good CG promotes the economic performance and productivity of companies and raises the trust of investors (OECD, 2004). CG is believed to have important implications for economic growth opportunities since better CG practices decrease risks for customers, attract venture capital and boost business efficiency (Spanos, 2005). In addition, CG enhance access to external funding for the company, lower capital costs and increase operating performance. Similarly, CG provides processes that can be used by foreign investors to defend themselves against insider excesses (La Porta et al., 1998). According to Mugarura's (2016) CG philosophy is summarized in assessing whether the company is regulated by legislation, rules and procedures. A well-devised CG structure should include mechanisms for the board and management in order to ensure that the company's priorities and interests are accomplished. The development of an efficient CG structure within an individual company and in the industry as a whole tends to provide a degree of trust required to encourage further investment and facilitate the proper functioning of the business economy (OECD, 2004).

2.2.1.1 Corporate Governance in Palestine

The Code of CG in Palestine, issued in November 2009, adopted the broad concept of CG: "The set of rules and procedures by which the company is managed and supervised, through the organization of relationships between the board of directors, the executive management, shareholders and other stakeholders, as well as the company's social and environmental responsibility" (Code of CG in Palestine, 2009). In recent years, interest in CG has risen in Palestine. With the creation of the Palestinian Capital Market Authority (PMCA) and the establishment of the National Governance Committee in Palestine, progress in CG has been initiated (PCMA, 2020). The National Governance Committee formed a professional team to write the code of CG. The team's purpose was to create CG rules in line with the prevailing circumstances and regulations in Palestine, taking into consideration the existing regional and international standards of CG. The Framework of code of CG published in November 2009, and since this code applies to public shareholder companies and financial organizations under the oversight and regulation of PCMA, the committee is allowed to oversee the enforcement and compliance of companies with the rules in the code. Regarding the banking industry, the Palestinian Monetary Authority has attempted to establish rules for the regulation of Palestinian banks (PCMA, 2020).

2.2.1.2 Corporate Governance in Jordan

Jordan's Securities Commission published a code of CG principles (Al-Rahahleh, 2017). With the goals of expanding Jordan's national capital market and boosting the country's economy on all levels (Shahwan & Mohammad, (2016). Under the legislative and organizational framework, Jordanian enterprises accepted the OECD corporate governance guidelines. Jordan's implementation of the corporate governance code may be divided into five categories: Disclosure and compliance with the accounting standards, transparency in privatization, legislative framework and government oversight, efficient

supervision of the board of directors, and protection of minority rights of shareholders and capital market's framework (Shahwan & Mohammad (2016).

2.2.2 Corporate Failure

Failure is a broad term that cannot be limited to one meaning, even in the financial context. Many studies perceive it as the financial disparity companies may suffer from due to failure of their capital to meet organizational obligations in the short term (Scott,1981); others believe it to be such a growth in the debt of an entity that leads to a reduction in the entity's ability to raise revenue, which results in inadequate cash flow to perform its operations (Scott,1981). One of the most important priorities companies aim to accomplish is "continuity, survival and growth". If this priority is applied to the financial results of a company, it helps measure the company's performance early enough to facilitate the detection of instances of default (Hjleh, 2019).

A financial failure is an event in which a company collapses because it can no longer generate enough income to meet its costs (Ucbasaran et al., 2013). Many studies have shown that there are internal and external reasons behind the financial losses of a company. Internal factors include inefficient revenues, pricing and development operating practices, shortage of new technologies, the use of short-term financing tools to finance capital assets and inefficient management, in particular, in the processing of receivables and the management of inventories and the creation of losses (Smit & Watkins, 2012).

External factors include a scarcity of financing capital, a negative perception of the stock market among investors and economists, intensified competitiveness amongst companies operating in the same sector and general economic conditions. Financial losses of a company trigger the insolvency of its activities; as a result, companies cannot meet their ongoing obligations even though their assets exceed these obligations. This does not mean, however, that this company is bankrupt; it is possible to incorporate acceptable strategies to boost its standing. Bankruptcy is deemed the highest degree of failure in the corporate context, which occurs when the costs outweigh the assets and the owners continue to lose (Charan et al., 2002).

2.2.3 R/RStudio Package

Statistical computing refers to the wide use of methods that require various statistical and computing skills to solve the problem and analyze natural or social phenomena. Computational statistics analyses are performed through MATLAB, Minitab, Excel, SPSS, S, R and Python, which aim to design an algorithm to implement statistical methods on computers. In R/RStudio, a package is defined as a well-defined collection of components, data and functional codes that allow users to start with a certain set of inputs (Hufnagelet al., 2020). Users of the R/RStudio integrated development environment have access to a variety of packages that serve as the foundation for building, planning and developing (Verzani, 2011). The first version of the R language was developed in 1996 by Ross Ilhaca and Robert Gentleman, two statisticians at the University of Auckland in New Zealand. The language is named after the first letter of the names of its creators (www.nytimes.com, 2021).

2.3 Corporate Governance and Corporate Failure

According to Agency theory, conflict of interest between management and owners may be avoided through extensive oversight by the board of directors on executives, and thus improve the performance of the management and increase the value of shares, so the company survival is enhanced (Bonazz & Islam, 2007). The Resource-dependence theory means a company that seeks to explain its behavior in terms of those critical resources that a company must have in order to survive (Johnson, 1995). According to Appiah and Chizema (2015), the most important duty of the board of directors is to ensure the survival of a company. Mugarura (2016) argued that the latest global economic crisis has revealed a strong link between CG and corporate collapse. This argument was based on the increase in collapses of companies, such as Northern Rock (Britain's fifth-biggest brokerage company), after the foregoing financial crisis. Here, it must be recalled that the European credit and financial crises and the stagnation in the development of the US economy were partially results of a lack of CG. There is empirical evidence to suggest that the following characterizes failed companies for example, the collapse of some companies, including Enron, was characterized by the weak credibility of the internal audit teams, poor attitudes towards the company, absence of structured CG structures and lack of knowledge of employees on matters such as business risk management. Among other factors, weak CG processes and obsolete internal audit practices were the dominant

concerns in the failure of numerous businesses and eventual closure of numerous banks (Mugarura, 2016). Süsi and Lukason (2019) aimed to figure out how CG in relation to small- and medium-sized enterprises (SMEs) is associated with failure risk. Their study focused on a total of 67,058 SMEs from the Estonian Market Registry. The results show that the risk of failure declines with the increase in the age of the manager and the presence of management ownership. Conversely, the involvement of larger boards of directors and executive boards in companies leads to higher failure risks. According to study data pertaining to a Taiwanese company, CG indicator includes board composition, ownership structure, cash flow rights, key person retained and others (Liang et al., 2016). The composition of the board and ownership structure has been the most critical factor of CG in bankruptcy prediction (Liang et al., 2016). Thus, the following main hypothesis has been formulated:

HA: There is a significant impact of CG mechanisms on CF.

2.3.1 Board Size

The common belief is that larger boards are ideal for organizational success, as the members have a higher-level diversity of experience, which allows for better judgments and makes the members less prone to be dominated by a strong CEO. Anderson et al. (2004) concluded that businesses with greater board size are capable of forcing management to seek lower interest rates and improve results. However, on the other hand, larger commissions are more vulnerable to power games and alliance buildings, which can hamper the pace of crisis decision-making; considering this, smaller boards could be more effective. Similarly, several studies found that smaller boards increase efficiency and, hence, reduce the chance of company failure (e.g., Süsi & Lukason, 2019). Ciampi (2015) believed that board size has a positive association with small business loss, however that conclusion was not proven. To study the impact of board size on CF, Chaganti et al. (1985) investigated the disparities among the board composition of 21 pairs of failed and non-failed companies in the US. The findings revealed that the nonfailed companies had bigger boards. Platt and Platt (2012) explored the association between corporate BC and CF. They found some non-failed companies do have larger, older boards. Companies with comparatively bigger boards have better odds of success. Further, Lakshan and Wijekoon (2012) investigated the impact of CG mechanisms on the CF of listed companies in Sri Lanka. The researchers noticed a significant impact of board size on CF. Ciampi (2015) explored the impact of CG on bankruptcy prediction for Italian SMEs. They found that board size did not have a substantial impact on the risk of financial failure. Taking into account these findings, the following sub-hypothesis was formulated:

HA1: There is a significant impact of board size on CF.

2.3.2 Board Independence

The word "independent director" usually applies to non-executive directors (NEDs) who are free from personal or economic associations with the company and its management (Hsu & Wu, 2014). The agency theory states that if the board of directors is more independent from management, company performance increases (Fama & Jensen, 1983), which positively impacts the company's financial position and reduces failure rates. According to Musa (2020), independent directors reduce agency tensions between shareholders and managers. Uadiale and Fagberni (2012) reported that the board with the majority of external directors offers companies more experience and is in a better position to supervise and regulate managers, thereby minimizing earnings management. Beasley (1996) found that corporate financial crime is more likely to occur in the case the board consists of fewer outside or independent directors. Hsu and Wu (2014) stated that NEDs who have ties with companies or their management are classified not only as nonindependent NEDs but also as "grey" directors. Reformers of CG generally argue that NED-company affiliations reduce the effectiveness of NED monitoring, as these affiliations may lead to potential conflicts with shareholders. Hsu and Wu (2014) observed the risk of corporate collapse is smaller both when companies have a higher number of grey directors compared to executive directors or independent directors. On the other hand, there is a favourable association between the probability of CF and the number of independent directors on corporate boards: The results show that businesses with higher numbers of grey directors are less likely to fail, whereas the percentage of independent directors and the likelihood of CF are positive. However, Riyadh et al. (2019) and Wang and Deng (2006) found that there is an insignificant association between board independence and financial distress. Based on these pieces of information, the following sub-hypothesis was formulated:

HA2: There is a significant impact of board independence on CF.

2.3.4 CEO Duality

The chairman of the board (COB) of directors must be the same as the CEO. Concerning this statement, Finkelstein and D'aveni (1994) claimed that stewardship theories contend that an employee should increase organizational success while operating in both positions since such an arrangement removes all internal and external uncertainties related to accountability for company procedures and outcomes. However, Fama and Jensen (1983) asserted that concentration of decision-making and decision control power in the hands of one individual decreases the efficiency of the board. Xu et al. (2018) believed that to ensure independence, the COB and the CEO must not be the same person. Moreover, being the COB can impact the motivation of a CEO to commit fraud. Ciampi (2015) showed that CEO duality is associated significantly and adversely with the failure of SMEs. To investigate the impact of attributes of CG and earnings management in Sri Lanka, Rajeevan and Ajward (2019) selected 70 companies listed on the Colombo Stock Exchange; a positive association was found between CEO-Chair duality and earnings management. Agency theory proposes a higher number of independent external board directors and the segregation of the duties of CEO and COB to improve the independence of the board and effectively discharge its role (Donaldson & Davis, 1991). Manzaneque et al. (2016) asserted that CEO duality has an insignificant association with the likelihood of financial distress.

In this study, CEO duality is considered a significant independent variable. Thus, the following sub-hypothesis was formulated:

HA3: There is a significant impact of CEO duality on CF.

2.3.5 Ownership Structure

According to Assenga et al. (2018), Ownership Structure is the most cited CG determinant. Several studies have shown that the ownership structure of a company plays an active role in determining the success or failure of that company. The agency theory claims that a separation between ownership and management can lead to a conflict of interest between management and shareholders, as managers can then become self-interested and opportunistic and may have different goals (Fama & Jensen, 1983). Further, the theory states that the growing percentage of board ownership may be of importance to both managers and stakeholders. This is likely since companies with a

larger level of board ownership would be able to better integrate the interests of shareholders and managers, resulting in reduced agency costs (Jensen & Meckling, 1976). Agency theorists believe that it is the main responsibility of the board to monitor executives in order to protect shareholders from potential conflicts of interest. The board of directors is an important entity that tracks and stops managers from pursuing their interests at the expense of shareholders (Darko et al., 2016). Bukar et al. (2020) examined the impact of the ownership structure characteristics on the financial performance of deposit money banks in Nigeria; they found that ownership structure have a positive impact on ROA. Wang and Deng (2006) found that there is an insignificant association between board ownership and financial failure. Fama and Jensen (1983) noted that the ownership structure is the most significant element in determining the equity of shareholders and good company results. In fact, individual shareholders should not influence company performance, as all shareholders jointly have the right to vote on crucial matters relating to the company's performance in compliance with their ownership. The ownership structure may impact the probability of managers confessing corporate financial fraud (O'Connor et al., 2006). Haat et al. (2006) discovered that failing companies had a high percentage of insider ownership and performed poorly. Udin et al. (2017) indicated that the ownership structure has an insignificant impact on the probability of companies' financial distress. However, the results showed that, in the case of Pakistan, foreign shareholdings have a substantial negative association with the probability of financial distress in companies. Further, evidence of a negative negligible association between institutional ownership and financial distress was observed, suggesting that institutional investors in Pakistan are passive. The findings further showed a strong and significant association between the ownership of insiders and the risk of financial distress in companies. This finding is consistent with the idea of entrenchment, which asserts that when insider shares in a company increase, they become more aligned with their own interests than those of outside shareholders. The findings also revealed insignificant links between government shareholding and the likelihood of financial distress. This can be explained by the fact that the goal of government entities is social welfare rather than profit maximization.

In current study, the ownership structure is considered as a independent variable. Thus, the following sub-hypothesis was formulated:

HA4: There is a significant impact of ownership structure on CF.

2.3.6 Ownership Concentration

According to Süsi and Lukason (2019), companies with concentrated ownership have large shareholders owning the majority of the company's shares. , and that makes them particularly interested in improving the company's performance. In concentrated ownership, shareholders make extra efforts to actively and effectively monitor the activities of the company's managers and performance as compared to dispersed ownership. This decreases the neglecting of managers, thereby reducing the potential value of damaging activities, which, in turn, reduces the risk of CF. However, prior studies have provided mixed findings concerning the relationship between concentrated ownership and CF. Although many studies find that focused ownership is beneficial for company performance, thereby decreasing the risk of failure (e.g., Paniagua et al., 2018), a non-linear association between ownership concentration and performance has been shown by other studies (e.g., De Miguel et al., 2004). Another series of analyses concluded that the connection between ownership structure and company performance is insignificant (e.g., Demsetz & Villalonga, 2001). Sami et al. (2011) claimed that the concentration of shareholder ownership could contribute to some major shareholders engaging in activities that could influence company performance. By appointing their preferred candidates to different roles on the board and in the top executive staff, major shareholders may influence the voting of board members and executives. This results in an increase in opportunities for senior managers to control company activities. Consequently, the major of shareholders and their interests impact the company's performance. However, any agency issues may be resolved by ownership concentration. It is possible to control both managers and shareholders when a focused group of shareholders succeeds in appointing their representatives to the board or as executive staff. The conflicts among owners and their agents should, therefore, be resolved, ultimately leading to improvement in company performance. Ciampi (2015) found that the concentration of ownership on the board is negatively and significantly associated with small businesses' failure. Saggar and Singh (2017) argued that the agency theory's emphasis of ownership concentration will contribute to less asymmetric information and fewer principal-agent disputes, and agents disclose more data.

Taking into account these pieces of information, the following sub-hypothesis was formulated:

Has: There is a significant impact of ownership concentration on CF.

2.3.7 Audit Committee

The presence of a strong audit committee ensures that the company is well-supervised. According to the agency theory, the conflict between owners and agents is caused by a misalignment of interests. Therefore, management performance will improve if independent parties such as the audit committee exist. The effectiveness of an audit committee is emphasized by Saputri and Asrori (2019). The audit committee generally improves the efficiency of the board's functions such as audit quality, independence in nomination and consideration of compensations. In particular, the audit committee's functions such as reviewing financial statements and supervising the actions of executives are related to the board goals and recommendations. An audit committee can effectively observe the activities of managers on behalf of the board whenever it works independently (Al Farooque et al., 2019). According to Okpala (2012), the task of the audit committee is to overhaul the financial system and safeguard the credibility of the financial statements to accurately represent the company's financial transactions and to provide a real and honest vision for shielding the company from potential risks of default and CF. Carcello and Neal (2000) believed that to strengthen accounting standards, an audit committee needs to exist. Most studies have indicated that there is a negative link between the actions of the audit committee and CF, which increases the consistency of CG and helps avoid crisis (Lakshan & Wijekoon, 2012). Nuresa and Hadiprajitno (2013) showed that high audit committee competency can reduce agents' attempts to alter financial data or the company's financial procedures, protect principals from the repercussions of agency fraud and help the company avoid financial crisis. Other studies have presented a contradictory opinion. According to Widyaningsih (2020), the establishment of an audit committee in a company might give increased control over management, resulting in financial distress. Conversely, according to Kallamu and Saat (2015), the performance of the audit committee is determined by the committee's features, not merely by its presence. Further, a few studies have demonstrated the possibility of a positive association between the exposure of a company to the risks of financial failure and the various characteristics of an audit committee, such as its size (Karamanou & Vafeas, 2005), independence (Abbott & Parker, 2000), tenure (Aldamen et al., 2011), financial expertise (Qin, 2007) and number of meetings (Stewart & Munro, 2007). In addition, the problems among audit committee members may have an impact on the financial position of the company. In particular, Habib and Bhuiyan (2016) proved that the presence of problems among the

directors of the audit committee is associated with real earnings management and fraudulent reporting practices. However, other studies found an insignificant association between the existence of audit committee and company's failure (Beasley, 1996; Hwang & Lin, 2008).

Considering the above-mentioned information, the following sub-hypothesis was formulated:

HA6: There is a significant impact of the audit committee on CF.

2.4 Board of Directors' Characteristics and Corporate Failure

According to the upper echelons theory, the collective features of senior management teams impact company performance. In the context of organizational behaviour, the top echelon hypothesis has sparked a lot of attention. "Upper Echelons: The Organization as a Reflection of Its Top Managers", by Hambrick and Mason (1984), is a major paper on this topic. The writers of the paper contended that complex decisions, such as strategic decisions, are more often the result of behavioural variables than that of systematic economic variables. Many researchers have studied BC and the impact of BC on corporate financial failure, given that it is one of the factors that may lead to the failure or success of a company.

Platt and Platt (2012) investigated the connection between the characteristics of the executive and a company's bankruptcy; five board compositions and nine board elements were recommended as proxies. They found that non-bankrupt enterprises have big, older boards, many independent directors, more seated CEOs and less management as compared to bankrupt enterprises. Saggar and Singh (2017) highlighted the influence of board members' characteristics on decision-making. They consider gender, age, technical background and education are the BC.

This study selected four characteristics of the board of directors – board age, board gender diversity, board education and board activity – in order to study their impact on the financial failure of companies. Thus, the following main hypothesis was formulated:

HB: There is a significant impact of BC on CF.

2.4.1 Board Age

According to the upper echelons theory, the collective features of senior management teams impact on company performance and survival. According to Shore et al. (2009), studies on age are substantially less developed than those related to gender and race. The age of the board of directors, which reflects their knowledge and expertise, has an impact on a wide range of choices and activities. According to Mahadeo and Soobaroyen (2012), board members should be heterogeneous in terms of age (36–55 years old) in order to maximize business value. In contrast, Murray (1989) showed that a homogeneous board comprises people who share similar values, leading to increased goal achievement.

In the past, researchers have studied the link between business success and board age; however, the results are inconsistent. According to Houle (1990), a mixed-aged board can ensure a more efficient division of labour at the board level, with the older group providing experience, connections and financial resources; the mid-group performing main executive responsibilities and the younger group learning and continuing to develop their knowledge of the business.

According to Xu et al. (2018) and Serfling (2014), board directors should estimate the risk of financial fraud depending on their different features. For example, owing to their experience, senior directors are more likely to keep a tight eye on executives. Platt and Platt (2012), Poon et al. (2013) and Süsi and Lukason (2019) found a substantial and favourable link between senior board members and increased business value. In addition, Serfling (2014) and Xu et al. (2018) found that when the average age of the board of directors rises, the CEO of the company is less likely to engage in corporate financial crime. This finding demonstrated the value of senior directors in improving corporate operations. However, Ali et al. (2014) discovered a negative link between the role of senior board members and company survival, while Bunderson and Sutcliffe (2002) and Jhunjhunwala and Mishra (2012) found insignificant results.

Considering these pieces of information, the following sub-hypothesis was formulated: **HB1:** There is a significant impact of board age on CF.

2.4.2 Board Gender Diversity

Gender diversity on boards is one of the most researched board features (Alia & Mardawi, 2021; Shore et al., 2009). The human cognition theory (Campbell, 1960) and the information processing theory (Ashby, 1956) suggested that an entity that includes people of different backgrounds and characteristics can accomplish increased information richness, thereby achieving better options, strategies and products to be delivered from various perspectives, which results in more efficient decisions. Thus, female representation, according to the resource dependence hypothesis, increases directorship resources with more extensive assessments, especially in stressful situations (Perryman et al., 2016). Female CEOs, according to proponents of the agency theory, may help companies save money by bringing new views to boards of directors and making wise judgments (Carter et al., 2003). Chen et al. (2018) found that female representation on the board is associated with more creative achievement and, therefore, increased company productivity in highly innovative industries. For a given research and development expenditure, female-led companies choose to invest more in creativity and earn more trademarks and citations (Chen et al., 2018). According to the proponents of gender equity, women have new ideas and an ability to actively engage in discussions, which proves highly valuable than males when they making strategic decisions at board meetings. This has a positive impact on the company (Adams & Ferreira, 2004). Moreover, the presence of female directors on the board, as well as their degree of education, has a negative impact on the likelihood of fraud (Cumming et al., 2015). The upper echelons theory states that the views, beliefs and perceptual frames of board members influence their judgments. As a result of the heterogeneity of board gender, the details, facts and beliefs employed in decision-making are likely to grow (Hambrick & Mason, 1984). On the contrary, according to the diversity theory, greater similarities lead to shared outcomes, fewer differences and conflicts and higher levels of commitment and cohesiveness, trust and social integration. Consequently, interactions among people who share many similarities make it easier to achieve an agreement and take decisions promptly (Harrison & Klein, 2007). According to studies, males are more likely to be overconfident. Further, women are thought to be more emotional and sensitive than males (Khaw & Liao, 2018).

Thus, the following sub-hypothesis was formulated:

HB2: There is a significant impact of board gender diversity on CF.

2.4.3 Board Education

Educational diversity is defined as the variation in task-relevant expertise, skills and abilities of group members due to their academic background (Dahlin et al., 2005). As a result, many researchers find educational diversity to be an intriguing topic. According to the upper echelons theory, demographic features, such as age and education, are likely to impact decision-making for a critical aspect of the company, such as strategic decisions (Hambrick & Mason, 1984). According to Carson et al. (2004), the upper echelons theory indicates that the demographic features of senior managers or boards of directors and organizational decision-makers significantly impact business performance and survival. Here, it should be emphasized that one of the demographic criteria of the board is educational background (Jung & Ejermo, 2014). Anderson et al. (2011) believed that boardrooms consisting of directors with diverse credentials for education will benefit from a variety of experience, talents, skills and cognitive abilities. Additionally, Dahlin et al. (2005) found that having a team with a diverse educational background has a beneficial impact on the breadth and depth of information utilization. However, according to Bathula (2008), the presence of PhD members on a board is negatively related to the company's success; this is because even with knowledge and abilities in analysis and research, PhD members appear to offer little value to company performance. According to Rose (2007), formal education has minimal influence on company efficiency, as the work done on the boards is not unique to the field, and a university education or comparable certifications may be adequate to comprehend management information. Van Praag (2001), Davidsson and Honig (2003), Bathula (2008) and Mahadeo et al. (2011) found that an education degree is associated with higher failure rates. In contrast, Boden and Nucci (2000), Lin et al. (2000), Ganotakis (2010), Anderson et al. (2011) and Unger et al. (2011) found a negative link between education and company failure. However, Rose (2007), Fidanoski et al. (2014), Asoni and Sanandaji (2014) and Alessa (2019) found an insignificant relationship between CF and educational degree.

Thus, the following sub-hypothesis was formulated:

HB3: There is a significant impact of board education on CF.

2.4.4 Board Activity

The frequency of board meetings each year is an important element that determines the nature of a company's performance and, hence, its exposure to financial collapse risks. According to Vafeas (1999), during times of uncertainty, meetings are conducted more frequently. This leads to better financial results since board meetings held more regularly would help dedicate more time to dealing with issues connected to earnings manipulation. According to Zhou and Chen (2004), an effective board should meet more frequently to be aware of accounting and control-related issues so that the financial reporting process runs smoothly. A higher number of board meetings, however, may indicate that the board is aware of the company's bad financial activities, which might lead to insolvency, bankruptcy or financial trouble for the company in the future (Chen et al., 2006). Concompanying this fact, Al Farooque et al. (2019) claimed that 95% of enterprises in Thailand meet only four or five times per year. Surprisingly, 65% of boards meet to discuss crucial problems without the participation of management (Al Farooque et al., 2019). Jensen (1993) questioned the usefulness of board meetings since, in most cases, the CEO sets the agenda and provides information to the board members during the meeting. This lack of knowledge may prevent talented directors from successfully monitoring and assessing the CEO's performance and the company's strategy. According to Jensen (1993), board activity is more reactive than proactive since the board meets more frequently after a bad performance. According to Brick and Chidambaran (2010), If a company is participating in a big investment program, such as a merger or acquisition, or is compelled to restate results, anticipate the board to meet more frequently. Similarly, because the board's role is to give strategic guidance to management, their study expect board involvement to expand as investment possibilities grow. Increased board action, on the other hand, may have a detrimental influence on company value if the motivation behind it was just to comply with regulations and avoid stockholder lawsuits. Abubakar et al. (2017) and Mansor et al. (2013) showed that board meetings have a major negative impact on earning management methods. Jensen (1993), Dissanayke et al. (2017) and Ali and Nasir (2018) found a positive relationship between financial distress and board activity. Based on the above-mentioned arguments, the board activity comes out to be a significant independent variable. Thus, the following sub-hypothesis was formulated:

HB4: There is a significant impact of board activity on CF.

2.5 Control Variables

Previous studies dealt with many other variables to predict their impact on CF, including profitability, liquidity, leverage, total asset, establishment age, listing age, capital structure, company growth, sales growth, debt, market value and operational risk. The current study, after exploring the previous studies, examined the impact of liquidity, profitability and firm size as control variables on CF. This was done since these variables were found to have a significant impact on CF in most studies. These studies were conducted under the assumption that managers sometimes use different methods for manipulation to serve their own interests, such as big bath, income smoothing, cooking the book and earnings management, such that manipulated values appear in the official documents. This impacts the survival and failure of a company. Finally, the following main hypothesis was formulated to compare the above-mentioned issues for Palestine (PEX) and Jordan (ASE).

Hc: There are significant differences between PEX and ASE regarding the impact of CG and BC on CF.

Table (1) summarizes the research hypotheses.

Table (1)

Hypothesis	Content
HA	There is a significant impact of CG mechanisms on CF.
HA1	There is a significant impact of board size on CF.
HA2	There is a significant impact of board independence on CF.
HA3	There is a significant impact of duality on CF.
HA4	There is a significant impact of ownership structure on CF.
HA5	There is a significant impact of ownership concentration on CF.
HA6	There is a significant impact of the audit committee on CF.
HB	There is a significant impact of BC on CF.
HB1	There is a significant impact of board age on CF.
HB2	There is a significant impact of board gender on CF.
HB3	There is a significant impact of board education on CF.
HB4	There is a significant impact of board activity on CF.
HC	There are significant differences between PEX and ASE regarding the impact
	of CG and BC on CF.

Summary of Hypotheses

2.6 Agency Theory and Resource Dependence Theory

Bonazz and Islam (2007) stated that the basic essence of the agency theory is to avoid conflicts of interest through the oversight of the board of directors. This improves the CEO's performance and raises the share value. The model developed in this study comprises CG and the relationship between board composition and financial performance. The model measures company success in terms of two factors: the ability of the CEO and active monitoring. The study results indicated that the agency problem is resolved by assuring that board oversight on the CEO performance, which improves CEO performance and avoids conflicts of interest. The resource dependence theory suggests that a company seeks to explain its behaviour in terms of its critical resources in order to survive (Johnson, 1995). Jackling and Johl (2009) studied the above-mentioned theories and examined the relationship between CG and the financial performance of Indian companies. The results of the study support the agency theory, as a greater proportion of external directors on boards of directors were found to be associated with improved company performance. However, the idea of separating leadership roles in relation to the agency theory was not supported. The results supported the resource dependence theory, as they indicated that larger board size has a positive impact on company performance.

2.7 Upper Echelons Theory

According to the upper echelons theory, the collective features of senior management teams impact company performance. In the realm of organizational behaviour, the top echelon hypothesis has sparked a lot of attention. "Upper Echelons: The Organization as a Reflection of Its Top Managers", by Hambrick and Mason (1984), is a major paper on this topic. The writers of the paper contended that complex decisions, such as strategic decisions, are more often the result of behavioural variables than that of systematic economic variables.

2.8 Theoretical and Empirical Gap

The literature review showed that the impact of CG and BC on CF in various countries has been discussed in many previous studies. Nevertheless, the issue of failure remains a topic that is somewhat recent, which is why it suffers from a lack of studies. Moreover, to the best of the researcher's knowledge, such studies have not been conducted in Arab nations such as Palestine and Jordan. Additionally, there are many characteristics of the board, specifically board education and board age, that impact CF, but the direct impact of these elements on the issue of financial bankruptcy has not been studied.

Table (2) summarizes all previous research studies mentioned in the chapter.
Table (2)

Summary of Results from Previous Studies

	Dogitiyo	Negative	Incignificant
	Pulsar et al. (2020) and Süsi and	Charanti at al (1085) Diatt and Diatt	Lakahan and Wijakaan (2012) and
Board size	Example 1 (2020) and Susi and Lukason (2019)	(2012)	Ciampi (2015)
Board independence	Hsu and Wu (2014)	Beasley (1996), Uadiale and Fagbemi (2012), Platt and Platt (2012), Süsi and Lukason (2019) and Musa (2020)	Riyadh et al. (2019) and Wang and Deng (2006)
CEO duality	Rajeevan and Ajward (2019)	Platt and Platt (2012) and Ciampi (2015)	Wang and Deng (2006) and Manzaneque et al. (2016)
Ownership structure	Haat et al. (2006)	Fama and Jensen (1983), O'Connor et al. (2006), Süsi and Lukason (2019) and Bukar et al. (2020)	Wang and Deng (2006) and Udin et al. (2017)
Ownership concentration	Sami et al. (2011) and Ciampi (2015)	O'Connor et al. (2006), Paniagua et al. (2018) and Süsi and Lukason (2019)	Demsetz and Villalonga (2001) and De Migule et al. (2004)
Audit committee	Abbott and Parker (2000), Stewart and Munro (2007), Aldamen et al. (2011), Habib and Bhuiyan (2016) and Widyaningsih (2020)	Lakshan and Wijekoon (2012), Okpala (2012) and Nuresa & Hadiprajitno (2013)	Beasley (1996) and Hwang and Lin (2008)
Board Age	Ali et al. (2014)	Platt and Platt (2012), Poon et al. (2013), Serfling (2014), Xu et al. (2018) and Süsi and Lukason (2019)	Bunderson and Sutcliffe (2002) and Jhunjhunwala and Mishra (2012)
Board gender	Adams and Funk (2012) and Poletti-Hughes and Briano- Turrent (2019)	Adams and Ferreira (2009), Post and Byron (2015), Cumming et al. (2015) and Chen et al. (2018)	Shrader et al. (1997)
Board education	Van Praag (2001), Davidsson and Honig (2003), Bathula (2008) and Mahadeo et al. (2011)	Boden and Nucci (2000), Lin et al. (2000), Unger et al. (2011), Anderson et al. (2011) and Ganotakis (2010)	Rose (2007), Asoni and Sanandaji (2014), Fidanoski et al. (2014) and Alessa (2019)
Board activity	Dissanayke et al. (2017) and Ali and Nasir (2018)	Mansor et al. (2013) and Abubakar et al. (2017)	

Chapter Three Research Methodology

3.1 Introduction

This study aims to investigate the impact of CG practices and BC on CF in Palestinian and Jordanian companies. In this chapter, the source of data, research sample, research model, variables measurement and research technique used to conduct this study are described.

3.2 Data Collection

Achieving the study objectives requires relying on secondary data related to the study variables. Needed data to measure CG variables (board size, board independence, CEO duality, ownership structure, ownership concentration, and audit committee), BC variables board age, board gender, board education and board Atcitty), and corporate status (failed/Non-Failed) were mainly obtained from the annual reports of industrial and services companies that were published on the PEX and the ASE websites from 2015 to 2019. only ages of board members were obtained from the Palestinian Civil Registry. The total number of the study observations is 7,200 observations. Table (3) shows label of each variable and the sources from which data was obtained.

Table (3)

Variables	Label	Sources
Corporate failure	CF	Annual Report
CG	CG	Annual Report
Board size	BSIZE	Annual Report
Board independence	BINDEP	Annual Report
CEO duality	DUALITY	Annual Report
Ownership structure	OWNERS	Annual Report
Ownership concentration	OWNERC	Annual Report
Audit committee	AUDITC	Annual Report
BC	BC	Annual Report
Board age	BAGE	Palestinian Civil Registry and Annual report
Board of gender diversity	BGEND	Annual Report
Board education	BEDU	Annual Report
Board activity	BACTIV	Annual report
Firm size	FSIZE	Annual Report
Profitability	PROFIT	Annual Report
Liquidity	LIQUD	Annual Report

Labels and Data Sources for Variables

3.2.1 Palestine Exchange

At the beginning of 1995, the PEX was established in Nablus as a private shareholder company. The PEX was converted to a public shareholding company in 2010. It aims to use the newest technologies in the financial market and comply with the newest laws and regulations to maintain a market with the highest transparency, fairness and security for investors. By July 2012, 48 companies, with a total valuation of \$2.8 billion, were listed on the PEX. Half of the companies listed deal in Jordanian dinars, and the others in US dollars (PEX, 2020). Today, the companies listed in the PEX belong to five sectors including: industry, services, banking and financial services, insurance and investment (PEX, 2020). Table (4) shows the distribution of Palestinian companies according to the various sectors in the PEX.

Table (4)

Sectors	Number of companies		
Industry	13		
Services	10		
Banking	7		
Insurance	7		
Investment	13		
Total	47		

Distribution of Companies in the Palestine Exchange

Source: PEX (2020)

3.2.2 Amman Stock Exchange

The ASE was created as a non-profit organization in March 1999. It was approved to act as a controlled securities trading platform in Jordan. In February 2017, the ASE, under the name "The Amman Stock Exchange Company", became a government-owned public shareholder company. The goal of the ASE Company is to run, control and develop the operations and activities of the markets for shares, services and derivatives within and outside Jordan. It aims to develop a strong and healthy atmosphere to ensure a good supply and demand relationship for securities trading in good and fair trading practices, to raise awareness and knowledge about financial market investments and to identify the services offered by the ASE companies (ASE, 2020). Today, The ASE includes companies from sectors such as industry, services and financial services (ASE, 2020). Table 5 shows the distribution of Jordanian companies according to their sector in the ASE.

Table (5)

Sectors	Number of companies		
Industry	34		
Services	43		
Financial	96		
Total	173		

Distribution of Companies in the Amman Stock Exchange

Source: ASE (2020).

3.3 Research Sample

The required data used in this study were manually collected. The main sources of these data were the PEX and the ASE databases. The sample of the study includes all companies that meet the following criteria:

- 1. The company should be listed on the PEX and the ASE during the 2015–2019 period.
- 2. The company should not have been bankrupt, merged or liquidated.
- 3. The data is available.

Table (6) presents the data distribution based on market and sector. The companies included in the study sample are presented in Appendix One.

Table (6)

Summary of the Study Sample

Market	Sector	Before exclusion	After exclusion	%
PEX	Industry	13	12	12.50
	Services	10	9	9.70
ASE	Industry	34	34	35.40
	Services	43	41	42.70
	Total	100	96	100

3.4 Research Model

Survival model was adopted as the methodology in order to achieve the research objective; this methodology has been used in previous studies as well (e.g., Fox, 2002; Iwasaki, 2014; Kristanti et al., 2016; Parker et al., 2002). The failure phase begins with a decline in company health, "which can involve intermediate events that led up to the resolve of financial distress" (Flagg et al., 1991). Survival analysis methods were used to analyze the influence of several continuous or categorical characteristics on the events that led to failure (Bowden & Hamilton, 1998).

Survival analysis examines the time it takes for events to occur. The prototypical type of event of failure is death in survival research, which means literally "survival analysis"; however, the nature of the survival analysis application is much wider (Fox, 2002).

The Cox hazard regression was used as one of the applications of the survival model. The use of the cox proportional hazards model was limited to medical research; Lane et al. (1986) were the first to use the Cox proportional hazards model in financial research. The Cox model's significant benefit over all other classification techniques is that it predicts the time of the failure of a company (Lane et al., 1986). Survival methodology aims to classify bankruptcies close to the initial bankruptcy date in a comparison between actual and predicted dates of failure. Lane et al. (1986) aimed to extend the Cox proportional hazards model to achieve CF prediction. The study results indicated that the overall accuracy of the Cox model classification is close to the discriminant analysis. Moreover, Parker et al. (2002) used survival analysis methods to examine the correlation among different attributes of CG and financial characteristics with distressed companies' likelihood of survival by applying Cox proportional hazards regressions. Furthermore, Kristanti et al. (2016) used survival analysis by applying the Cox hazards model to determine the impact of CG and the different financial ratios on the continuing financial distress in Indonesia.

This study is based on two models. While the first is CG model, the second is BC model These models are presented bellow as follows:

CG model:

$$CF(t) = a_0 + \beta 1BSIZE + \beta 2BINDEP + \beta 3DUALITY + \beta 4OWNERS + \beta 5OWNERC + \beta 6AUDITC + \beta 7FSIZE + \beta 8 LIQUD + \beta 9PROFIT + \varepsilon$$

BC model:

$$\begin{split} CF(t) &= a_0 + \beta 1BAGE + \beta 2BGENDER + \beta 3EDU + \beta 4BACTIV + \beta 5FSIZE + \beta 6 \ LIQUD \\ &+ \beta 7PROFIT + \varepsilon \end{split}$$

The dependent, independent and control variables used in these equations are defined in Table 7; t is the duration since the company's establishment; *a* is constant; ε is the error term; β is the coefficient of the variables. The conceptual framework of the research, which has been described in Chapter Two, is illustrated in Figures 1 and 2.

Figure (1)

Corporate Governance



Source: Researcher constructed.

Figure (2)

Board Characteristics Model



Source: Researcher constructed.

3.5 Variables Measurement

In this study, CF is the dependent variable. In this regard, financial failure is defined as a set of consecutive defaults that constitutes losses in the long run (Parker et al., 2002). This results in the company's obligations exceeding its assets and a decrease in the possibility of payment. Based on previous studies as Hjleh (2019) and the above-mentioned definition of financial failure, a company is classified as failed if there is a decrease in its cash flow from operating activities in successive fiscal years. (Parker et al., 2002).

On the other hand, CG and BC are independent variables. CG measured by board size, board independence, CEO duality, ownership structure, ownership concentration and audit committee; BC, it is measured by board age, board gender, board education and board activity.

Table (7) describes how each variable is measure.

Table (7)

Proxies of the Dependent, Independent and Control Variables

Variable	Measurement	Previous Research
Dependent Variable		
Corporate failure	If the company failed, then "1"; otherwise, "0"	Lakshan and Wijekoon (2012), Hsu and Wu (2014) and Cardoso et al. (2019)
Independent Variable		
Board size	Number of the board of directors	Dwekat et al. (2018), Süsi and Lukason (2019), Abdeljawad and Masri (2020) and Khatib and Nour (2021)
Board independence	Percentage of non-executive directors in the board	Dwekat et al. (2018) and Alia and Mardawi (2021)
CEO duality	If CEO and chairman roles are separated, then "1" otherwise, "0"	Hsu and Wu (2014), Yasser and Mamun (2016) and Cardoso et al. (2019)
Ownership structure	Percentage of shares held by managers	Xie et al. (2003), Asmar et al. (2018) and Alia and Mardawi (2021)
Ownership concentration	If one owner has over 50% of the shares, then "1"; otherwise, "0"	Süsi and Lukason (2019)
Audit committee	If the audit committee exists in the company, then "1"; otherwise, "0"	Dwekat et al. (2018) and Alia and Mardawi (2021)
Board age	The average age of board members	Xie et al. (2003) and Bonn et al. (2004)
Board gender	The number of female members divided by the board size	Xie et al. (2003), Assenga et al. (2018) and Abdeljawad and Masri (2020)
Board education	The proportion of members with a master's degree or PhD to the total number of board members	Fidanoski et al. (2014) and Guney et al. (2020)
Board activity	Frequency of board meetings per year held annually	Kyereboah-Coleman (2008) and Ansong (2015)
Control Variables		
Firm size	The natural log of total assets of the company	Peranginangin (2019), Oktaviani (2020) and Hasanuddin et al. (2021)
Profitability	Return on assets (ROA): Net income/total assets	Abeyrathna and Priyadarshana (2019), Farhan et al. (2020), Vedasto and Mbogo (2020) and Ravindran and Kengatharan (2021)
Liquidity	Current ratio: current asset/current liability	Husna and Satria (2019), Dahiyat et al. (2021), Hadian (2021) and Subing (2021)

3.6 Research Technique

Following previous studies (e.g., Fox, 2002; Iwasaki, 2014; Kristanti et al., 2016; Lane et al., 1986; Parker et al., 2002), survival analysis techniques were used in the current study to test the impact of CG and BC on CF. Moreover, descriptive statistics, Cox hazards regressions -It is a survival analysis technique-, log-likelihood test and statistical learning test were also used to test the research hypotheses.

The RStudio program, which is based on the R language, was used to analyze the data. In R/RStudio, a package is a well-defined collection of components, data and functional code that allows the user to start with a certain set of inputs. The user of the R/RStudio-integrated development environment has access to a variety of packages and analytics (Verzani, 2011).

Cox regression is a non-parametric method; therefore, it is robust to non-normal distributions (Parker et al., 2002). This is significant for this research analysis, as it seems possible that there is no normal distribution of BC and CG mechanisms. Cox proportional hazards model obtains a risk rate that provides the probability of the next instant occurrence of a specific event (bankruptcy), provided it has not happened till that point in time (Parker et al., 2002).

The method estimates parameter values for the evaluated variables by comparing the proportional impacts on the hazard rate with a baseline hazard, the rate determined when zero is set for all independent variable values. At a given point in time, companies with common CG and BC would have distinct rankings of probabilities of conditional distress. The basis for parameter estimation is given by the rankings. Every independent variable coefficient measures the change in the hazard rate of the defined independent variable's one-unit change, keeping all other variables constant in the model. The hazard ratio may be expressed as HR, which shows the impact on the impact on the hazard function HR or the situation failure (or distress) likelihood of a one-unit shift in the independent variable. Therefore, a hazard ratio of 1 means that a shift of one unit in the independent variable has no impacts on the probability of business failure that leaves all other variables fixed; a hazard ratio of less (more) than 1 means lower (higher) risk of business failure or default (Parker et al., 2002).

Chapter Four Results

This chapter presents the results of descriptive statistics, Cox hazards regression, loglikelihood and statistical learning tests. These results are explained them based on the extant literature discussed in Chapter Two. The following sections present the findings of the hypotheses testing conducted using RStudio.

4.1 Results of Descriptive Statistics

The analyses of the descriptive statistics related to all the variables in the study are presented in this section. Table 8 presents the results of the descriptive statistics for the overall study sample consisting of companies listed in PEX and ASE (as one group). While Table 9 and Table 10 provide separate descriptive statistics for the PEX companies and the ASE companies, respectively. The results of the descriptive statistics include the mean, standard deviation (Std-Dev), median, minimum (Min) and maximum (Max). They clarify the number of inputs and missing data. Moreover, detailed descriptive statistics analysis, including the Pearson's chi-squared test, analysis of variance (ANOVA), Wilcoxon test and Kruskal–Wallis test of study variables, for the study duration is presented in Appendix Three.

4.1.1 Results of Descriptive Statistics for Overall

Descriptive statistical analyses, for the period from 2015 to 2019, related to all the study variables, including dependent variable (CF), independent variables (CG and BC) and control variables, for the companies listed on the PEX and the ASE are presented in Table (8), see appendix (A).

Table (8), see appendix (A) presents the results of CF for the companies in the PEX and the ASE, indicating that in 2015, 21.9% of the sample comprised failed companies and the remaining comprised non-failed companies. However, the failure percentage decreased over time, in that in 2019, 10.4% of the sample companies were deemed to have failed, while 86.9% were marked as "non-failed". In 2015, BSIZE for all the companies ranged from 4 to 15 members, with a mean (median) of 8.4 (8). BSIZE range for the year 2019 was from 4 to 13 members, with the mean (median) of 8.3 (8). This result indicates that most companies complied with the rules of CG, which stipulates that

the board of directors should consist of at least five and at most 11 members (Code of CG in Palestine, 2009). In 2015, BINDEP scored a mean (median) of 0.9 (1), with Std-Dev being 0.1; the maximum value was 1, while the minimum was 0.4. In contrast, in 2019, the mean (median) was 0.9 (1), with Std-Dev being 0.1, the maximum value was 1 and the minimum was 0. The independence indices were 0.4, 0.1, 0.1, 0.1 and 0, respectively, from 2015 to 2019. This result indicates that over all the years, the sample companies included independent directors, thereby achieving one of the most important provisions of the CG code – the one that stipulates the necessity of independent directors on the board. The CEO and the chairman were different in nearly 91.6% of the companies in 2015, 89.6% in 2016, 95.8% in 2017 and 2018 and 93.8% in 2019. Regarding OWNERS, the percentage of shares held by managers ranged from 0 to 100%, with a mean (median) of 40% (47%). Further, the analysis of OWNERC shows that from 2015 to 2019, 28.7, 29.5, 30.2, 32.3 and 31.6% companies, respectively, had one concentrated shareholder. The percentages of companies with audit committee were 78.3, 81.7, 89.6, 89.6 and 90.6, respectively, from 2015 to 2019. This indicates the gradual increase in the awareness of establishing an audit committee. The mean level of BAGE during the period from 2015 to 2019 was 55.8, 55.9, 57.1, 56.4 and 57, respectively. The level of BGENDER ranged from 0 to 40% in 2015 and from 0 to 30% in 2019, but the mean value throughout the years was equal to 0. This result indicates that there were few women on the included companies' boards, which may be attributed to the socio-cultural norms prevalent in Arab society. BEDU ranged from 0 to 90% with a mean (median) of 40% (37%) in 2015. Considering 2019, BEDU ranged from 0 to 100% with a mean (median) of 40% (40%). This suggests that almost half of the board members of all the companies held higher degrees, indicating the existence of a fair educational diversity in the boards in general. The maximum levels of BACTIV were 19, 17, 17, 19 and 15, respectively, with a mean (median) of 7.4 (7), 7.6 (6), 7.6 (6), 7.5 (6) and 7.4 (7), respectively. This result aligns with the CG rules that focus on the necessity of holding board meetings in proportion with the company's work volume and its internal system in order to follow up on the business. On the other hand, regarding control variables, the mean and Std-Dev for FSIZE were 17.3 and 1.4 in 2015 as well as 2019. The profit results overall indicate that the proxy ROA ranged from -0.4 to 1 in 2019. The mean (median) for LIQUD was 6.2 (1.44) with a range of 0.05 to 353.4 in 2019, and the Std-Dev was 36.

4.1.2 Results of Descriptive Statistical Analyses for Palestine Exchange

Descriptive statistical analyses, for the period from 2015 to 2019, related to all the study variables, including dependent variable (CF), independent variables (CG and BC) and control variables, for companies listed on the PEX are presented in Table (9), see appendix (A).

Table (9), see appendix (A) presents the results of CF for the companies in the PEX, indicating that 19% of the sample were failed companies, while the remaining 81% were non-failed in 2015. However, the failure percentage decreased over time, in that 9.5% of the sample companies were deemed to have failed, while 86.9% were non-failed in 2019. BSIZE for all companies ranged from 5 to 15 members with a mean (median) of 8.8 (8) in the year 2015. The range was from a low of 4 to 13 members with the mean (median) being 8 (7) in 2019. This result indicates that most companies complied with the rules of CG, which stipulate that the board of directors should consist of at least 5 and at most 11 members(Code of CG in Palestine, 2009). BINDEP scored a mean (median) of 0.9 (1) with Std-Dev being 0.1; the maximum value was 1, while the minimum was 0.6 in 2015. In contrast, in 2019, the mean (median) was 0.9 (0.92) with Std-Dev being 0.1; the maximum value was 1, but the minimum 0.6. The independence index was 0.6 throughout all the years. This result indicates that all the sample companies included independent directors, thereby achieving one of the most important provisions of the CG Code that stipulates the necessity of independent directors on the board. The CEO and the chairman were different in nearly 90% of the companies in 2015 and 90.5% from 2016 to 2019.

The percentage of OWNERS in 2015 ranged from 0 to 90% with a mean (median) of 50% (44%), while, in 2019, it ranged from 0 to 90% with a mean (median) of 50% (53%). OWNERC shows that during the period from 2015 to 2019, 35, 38.1, 38.1, 38.1 and 38.1% of the companies, respectively, had one concentrated shareholder. The percentages of AUDTC presence in companies from 2015 to 2019 were 60, 61.9, 61.9, 61.9 and 61.9. The mean level of BAGE was 56.7, 56.6, 56.5, 57.2 and 56.6, respectively. The level of BGENDER ranged from 0 to 40% in 2015 but from 0 to 40% in 2019, but the mean value throughout the years was equal to 10%. This result indicates that there were few women on the companies' boards, which may be attributed to the socio-cultural norms prevalent in Arab society. BEDU ranged from 10 to 90% with a mean (median) of 50% (50%) in 2015. However, it ranged from 30 to 100% with a mean (median) of 60% (46%) in 2019.

This suggests that more than half of the board members of all the companies held higher degrees, indicating the existence of a fair educational diversity in the boards in general. Moreover, in all the companies, there were no boards of directors who did not hold a graduate degree, which indicates that graduate degree holders are involved in making all the decisions in the company. The maximum level of BACTIV was12, 12, 12, 12 and 12 with a mean (median) of 6.2 (6), 6 (6), 5.8 (6), 5.7 (6) and 5.8 (6), respectively. This result aligns with the rules of CG that focus on the necessity of holding board meetings to follow up on the business, in proportion with the company's work volume and its internal system. On the other hand, regarding control variables, the mean and Std-Dev for FSIZE were 17 and 1.4 in 2015 and 17 and 1.5 in 2019. The profit results overall indicate that the proxy ROA ranged from -0.1 to 0.1 in 2018 and -0.1 to .1 in 2019. The mean (median) for LIQUD was 2.6 (1.88) with a range of 0.1 to 9.9, and Std-Dev was 2.4 in 2019.

4.1.3 Results of Descriptive Statistical Analyses for Amman Stock Exchange

Descriptive statistical analyses related to all study variables, including dependent variable (CF), independent variables (CG and BC) and control variables for the companies listed on the ASE, from 2015 to 2019, are shown in Table (10), see appendix (A).

Table (10), see appendix (A) presents the results of CF in relation to the companies listed on the ASE. It is shown that 21.3% of the sample companies were failed, while 78.7% were non-failed in 2015. However, the failure percentage decreased over time -10.7%of the sample companies were failed in 2019, while 89.3% were non-failed. In 2015, the BSIZE for all companies ranged from a low of 4 members to a high of 14 members with a mean (median) of 8.3 (8). Nevertheless, it ranged from 4 to 13 members with a mean (median) of 8.4 (9) in 2019. This result indicates that most listed companies complied with the rules of CG, which stipulate that the board of directors should consist of at least 5 to at most 11 members (Code of CG in Palestine, 2009). BINDEP had a mean (median) of 0.9 (1) and Std-Dev was 0.1; the maximum value was 1, while the minimum was 0.4in 2015. On other hand, in 2019, the mean (median) was 0.9 (1) with a Std-Dev of 0.2; the maximum value was 1, while the minimum was 0. In contrast, the independence indices were 0.4, 0.1, 0.1, 0.1 and 0, respectively, from 2015 to 2019. This result indicates that almost all the sample companies include independent directors, thereby complying with one of the most important provisions of the CG Code, which stipulates the necessity of having independent directors on the board. In 2015, in 92% of the companies, the CEO

and the chairman were different, 89.3% in 2016, 97.3% in 2017, 97.3% in 2018 and 94.7% in 2019. The percentage of OWNERS in 2015 ranged from 0 to 100% with a mean (median) of 50% (45%). However, in 2019, it ranged from 0 to 100% with a mean (median) of 40% (46%). For OWNERC, it was found that in 27, 27, 28, 30.7 and 29.7% of companies, respectively, there was one concentrated shareholder from 2015 to 2019. The percentages of AUDTC presence in companies were 83.3, 87.5, 97.3, 97.3 and 98.7%, respectively. This indicates the increase in the awareness of companies of the need for an audit committee over the years. The mean level of BAGE during the period from 2015 to 2019 was 55.6, 55.7, 57.3, 56.2 and 57.1, respectively. The level of BGENDER ranged from 0 to 20% in 2015 but from 0 to 30% in 2019, but the mean value for all years was equal to 0%. This result indicates that there were few women on the boards of directors of companies, which may be attributed to the socio-cultural norms prevalent inArab society. BEDU ranged from 0 to 90% with a mean (median) of 30% (33%) in 2015. Considering 2019, BEDU ranged from 0 to 100% with a mean (median) of 30% (35%). This result suggests that almost a quarter of the members of the companies' boards held higher degrees, indicating the existence of unfair educational diversity in the boards in general. The maximum level of BACTIV was 19, 17, 17, 19 and 15, respectively, with a mean (median) of 7.8 (7), 8.3 (7), 8.1 (7), 8 (7) and 7.9 (7). This result aligns with the rules of CG that focus on the necessity of holding board meetings to follow up on the business, in proportion with the company's work volume and its internal system. On the other hand, regarding control variables, the mean and Std-Dev for FSIZE were 17.3 and 1.4 in 2015 as well as 2019. The profit results overall indicate that the proxy ROA ranged from -0.2 to 0.9 in 2018 and -0.4 to 1 in 2019. The mean (median) for LIQUD was 7.2 (1.42) with a range of 0 to 353.4, and the Std-Dev was 40.7 in 2019.

4.2 Results of Cox Proportional Hazards Regression Analyses

The results of survival analysis by the Cox proportional hazards regression technique were used in the next step for hypothesis testing. The results for overall, PEX and ASE have been presented in this section with a clarification of the survival curve in each case.

4.2.1 Overall results of Cox Hazards Regression Analyses

Figure (3) below displays the overall survival curve including all variables. It is obvious that the probability of company survival decreases with an increase in the risk of financial failure over time.

Figure (3)

Survival Curve for Overall



According to Figure (3), after 20 years since the establishment of the company, the probability of being exposed to the risk of CF will be approximately 30%. In other words, at the age of 20 years, the probability of CF risk for 71 companies will be 30%, meaning that approximately 24 companies will be exposed to the risk of financial failure and will exit the market. At the age of 40 years, 27 companies are probable to still survive. However, at 60 years, the probability of survival will favour nine companies. Finally, at the age of 80 years, the possibility of survival will be for only one company, in that the rest of the companies will be exposed to the risk of financial failure. These results assert

the importance of commitment to the application of CG rules and improving the current situation to maintain survival. However, the results of the Cox proportional hazards regressions for overall using CF as a dependent variable are shown in Table 11.

Table (11)

Variables	ER	HR	(95% CI)	P Value
CG				
BSIZE	< 1	0.88	(0.81, 0.95)	< 0.001
BINDEP	< 1	0.17	(0.05, 0.65)	0.01
DUALITY	> 1	1.09	(0.50, 2.36)	0.83
OWNERS	> 1	1.06	(0.49, 2.29)	0.88
OWNERC	> 1	1.3	(0.85, 2)	0.23
AUDIC	> 1	1.5	(0.87, 2.57)	0.14
BC				
BAGE	< 1	0.93	(0.90, 0.95)	< 0.001
BGENDER	< 1	0.06	(0.00, 2.27)	0.13
BEDU	< 1	0.19	(0.06, 0.57)	< 0.001
BACTIV	> 1	1.02	(0.94, 1.09)	0.68
Control-V				
FSIZE	< 1	0.77	(0.67, 0.89)	< 0.001
LIQUD	< 1	0.03	(0.01, 0.15)	< 0.001
PROFIT	>1	1	(1.00, 1.01)	< 0.001

Cox Hazards Model Adjusted to Overall

Note: ER: Expected Ratio; HR: Hazard Ratio.

The results in Table (11) indicate, for overall, there is a significant negative association between BSIZE and CF. The P-value equal to 0.001 is lower than the 0.05 level of significance when hazard ratio is equal to 0.88 (95% CI [0.90, 0.95]). This means that with an increase in BSIZE, the likelihood of CF decreases. In other words, larger boards are better for company survival than small boards. Further, the result indicates the change in the BINDEP has a significant negative association with CF. The P-value equal to 0.01 is lower than the 0.05 level of significance, whereas the hazard ratio is 0.17 (95% CI [0.05, 0.65]). This means as the BINDEP increases, the likelihood of a company's financial failure decreases, maintaining its survival. Moreover, the results indicate that

DUALITY has an insignificant positive association with CF, while the hazard ratio is equal to 1.09 (95% CI [0.50, 2.36]) and the P-value is equal to 0.83. Thus, DUALITY has an positive insignificant impact on company survival. Furthermore, this means that as DUALITY increases, the likelihood of financial failure increases by 9%. In additional, the result shows that the change in the OWNERS has an insignificant positive association with CF. While the hazard ratio is 1.06 (95% CI [0.49, 2.29]), the P-value is 0.88. This indicates that as the OWNERS increases, the likelihood of financial failure also increases. According to the Cox hazards regression results, OWNERC has an insignificant positive association with financial failure. When the hazard ratio is equal to 1.30 (95% CI [0.85, 2]), and the P-value is 0.23, this means that as the OWNERC increases, the likelihood of financial failure also increases insignificantly. Moreover, the results indicate that the existence of an AUDIC has an insignificant association with CF. Surprisingly, the hazard ratio is equal to 1.50 (95% CI [0.87, 2.57]). Therefore, there is a positive association between the AUDIC and CF, in that the AUDIC negatively impacts the survival of the company. This result indicates that the presence of the AUDIC increases the possibility of CF to one and a half times. The Cox hazards regression result indicates that changes in the BAGE have a significant negative impact on CF in overall companies. Since the Pvalue equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.93 (95% CI [0.90, 0.95]), this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Results also indicate that BGENDER has an insignificant association with CF in overall companies. Surprisingly, the hazard ratio is equal to 0.06 (95% CI [0, 2.27]); therefore, there is a negative impact of BGENDER on CF, which shows that it has a positive impact on companies' survival. The results indicate that the change in board education has a significant negative impact on CF in overall companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance and also since the hazard ratio is 0.19 (95% CI [0.06, 0.57]), it indicates that as the education level of the board increases, the likelihood of financial failure decreases, thereby maintaining company survival. Further, the result indicates that the change in the BACTIV has an insignificant positive association on financial distress in overall companies. Since the P value equal to 0.68 is higher than the 0.05 level of significance, and the hazard ratio is equal to 1.02 (95% CI [0.94, 1.09]). Therefore, BACTIV can negatively impact the company's survival. In summary, the survival model includes six CG variables and four BC variables as

independent variables, as well as three variables as control variables. The results indicate that the variables board size, board independence, board age, board education, firm size, liquidity and profit have a significant impact on CF. However, the variables of CEO duality, ownership structure, ownership concentration, audit committee, board gender and board activity have insignificant impacts on CF.

The interpretation of these results will be clarified in the next part of this chapter.

4.2.2 Results of Cox Hazards Regression Analyses for Palestine Exchange

Figure (4) below illustrates the survival curve for the PEX companies including all the current variables. It is obvious that the probability of survival for companies decreases with an increase in the risk of financial failure over time.

Figure (4)

Survival Curve for the Palestine Exchange



According to Figure (4), after 20 years since the establishment of the company, the probability of being exposed to the risk of CF will be approximately 25%. In other words, at the age of 20 years, the probability of CF risk for 18 companies will be 25%, meaning that approximately three companies will be exposed to the risk of financial failure and will exit the market. At the age of 40 years, the probability of survival will favour seven companies. However, at 60 years, the probability of survival will favour two companies. Finally, at the age of 80 years, all the companies will be exposed to the risk of financial failure. However, the results of the Cox proportional hazards regressions for PEX using CF as a dependent variable are shown in Table (12).

Table (12)

Variables	ER	HR	(95% CI)	P Value
CG				
BSIZE	> 1	1.63	(0.99, 2.69)	0.06
BINDEP	> 1	1.58	(0.83, 3.02)	0.16
DUALITY	> 1	1.28	(0.28, 5.91)	0.75
OWNERS	> 1	1.16	(0.70, 1.92)	0.56
OWNERC	> 1	3.4	(1.05, 10.98)	0.04
AUDIC	> 1	1.23	(0.45, 3.41)	0.69
BC				
BAGE	< 1	0.49	(0.26, 0.91)	0.02
BGENDER	> 1	1.1	(0.64, 190)	0.74
BEDU	> 1	1.9	(1.09, 3.33)	0.02
BACTIV	> 1	1.74	(1.00, 3.02)	0.05
Control-V				
FSIZE	> 1	1.14	(0.61, 2.14)	0.68
LIQUD	< 1	0.73	(0.38, 1.41)	0.35
PROFIT	< 1	0.84	(0.61, 1.15)	0.27

Cox Hazards Model Adjusted for Palestine Exchange

Table (12) indicates that, in Palestine, the change in the BSIZE has an insignificant positive impact on CF. Since the P-value equal to 0.06 is higher than the 0.05 level of significance, while the hazard ratio is equal to 1.63 (95% CI [0.99, 2.69]), it indicates that as the BSIZE increases, the likelihood of CF also increases. In other words, smaller boards are better for maintaining company survival as compared to larger boards. This result will be interpreted based on multiple reasons and justifications based on previous theories and

studies that will be clarified in the hypothesis testing section in the later section of this chapter. As seen, change in BINDEP has an insignificant positive association with CF in the PEX companies. Since the P-value equal to 0.16 is more than the 0.05 level of significance while the hazard ratio is equal to 1.58 (95% CI [0.83, 3.02]), it can be stated that as BINDEP increases, the probability of CF increases in PEX. Consequently, the probability of company survival reduces.

Moreover, the results indicate that DUALITY has an insignificant positive association with CF in the Palestinian companies since the hazard ratio is equal to 1.28 (95% CI [0.28, 5.91]) and the P-value is 0.75. Thus, DUALITY has a negative impact on company survival. Furthermore, this means that as CEO duality increases, the likelihood of financial failure increases by 28%. In additional, the result shows that the change in the OWNERS has an insignificant positive association with CF in Palestinian companies. Since the hazard ratio is equal to 1.16 (95% CI [0.70, 1.92]) and the P-value is 0.56, there is a positive association between OWNERS and CF. This means that as the OWNERS increases, the likelihood of financial failure also increases. According to the Cox hazards regression results, OWNERC has a significant positive association with financial failure. When the hazard ratio equals to 3.40 (95% CI [1.05, 10.98]) and the P value is 0.40, it indicates that as the OWNERC increases, the likelihood of financial failure also increases. Moreover, the results indicate that the existence of an AUDIC has an insignificant association with CF. Surprisingly, the hazard ratio is equal to 1.23 (95% CI [0.45, 3.41]).

Therefore, there is a positive association between the AUDIC existence and CF, So AUDIC existence has negative impact on company survival of the company. This shocking result indicates that the AUDIC existence increases the possibility of CF. The Cox hazards regression result indicates that changes in the BAGE have a significant negative impact on CF in the PEX companies. Since the P-value equal to 0.02 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.49 (95% CI [0.26, 0.91]), this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Results also indicate that BGENDER has an insignificant association with CF in Palestinian companies. Surprisingly, the hazard ratio is equal to 1.1 (95% CI [0.64, 1.90]); therefore, there is an insignificant positive impact of BGENDER on CF, which shows that it has a negative impact on companies' survival. The results indicate that the change in BEDU

has a significant positive impact on CF in the PEX companies. Since the P-value equal to 0.001 is lower than the 0.02 level of significance and also since the hazard ratio is 1.90 (95% CI [1.09, 3.33]), it indicates that as the education level of the board increases, the likelihood of financial failure increases, thereby negatively impacting company survival.

Further, the result indicates that the change in the BACTIV has a significant positive association on financial distress in the PEX companies. Since the P-value equal to 0.05. In addition, hazards ratio is equal to 1.02. Therefore, positive can negatively impact the company's survival. This is in fact a shocking result, as it means that the meetings of the board of directors in Palestinian companies have contributed to an increase in the possibility of company failure. In summary, the survival model includes six CG variables and four BC variables as independent variables, as well as three variables as control variables. The results indicate that the variables ownership concentration, board age, board education and board activity have a significant impact on CF. However, the variables board size, board independence, CEO duality, ownership structure, audit committee, board gender, firm size, liquidity and profit have insignificant impacts on CF.

The interpretation of these results will be clarified in the next part of this chapter.

4.2.3 Results of Cox Hazards Regression Analyses for Amman Stock Exchange

Figure (5) below indicates the survival curve for ASE companies in the presence of all the current variables. It is obvious that the probability of company survival decreases with an increase in the risk of financial failure over time.

Figure (5)

Survival Curve for Amman Stock Exchange



According to Figure (5), after 20 years since the establishment of the company, the probability of being exposed to the risk of CF will be approximately 30%. In other words, at the age of 20 years, for companies in Jordan, the probability of CF risk for 53 companies will be 30%, meaning that approximately 22 companies will be exposed to the risk of financial failure and will exit the market. At the age of 40 years, the probability of survival will favour 20 companies, meaning that 55 companies will be exposed to the risk of financial failure and will exit from the market. At 60 years, the probability of survival will favour seven companies. Finally, at the age of 80 years, one company will have the probability to survive and the rest of the companies will be exposed to the risks of financial failure. However, the results of the Cox proportional hazards regressions for ASE using CF as a dependent variable are shown in Table (13).

Table (13)

Variables	ER	HR	(95% CI)	P Value
CG				
BSIZE	< 1	0.84	(0.77, 0.92)	< 0.001
BINDEP	< 1	0.1	(0.03, 0.35)	< 0.001
DUALITY	< 1	0.71	(0.28, 1.78)	0.46
OWNERS	> 1	1	(0.43, 2.33)	1
OWNERC	>1	1.13	(0.69, 1.83)	0.63
AUDIC	> 1	1.77	(0.81, 3.85)	0.15
BC				
BAGE	< 1	0.93	(0.90, 0.96)	< 0.001
BGENDER	< 1	0.01	(0.00, 3.15)	0.12
BEDU	< 1	0.1	(0.03, 0.32)	< 0.001
BACTIV	> 1	1	(0.92, 1.08)	1
Control-V				
FSIZE	< 1	0.73	(0.62, 0.86)	< 0.001
LIQUD	< 1	0	(0.00, 0.03)	< 0.001
PROFIT	> 1	1	(1.00, 1.01)	< 0.001

Cox Hazards Model Adjusted for the Amman Stock Exchange

The results in Table (13) indicate that there is a significant negative association between BSIZE and CF in companies in Jordan. The P-value equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.84 (95% CI [0.77, 0.92]). This means that with an increase in BSIZE, the likelihood of CF decreases. In other words, larger boards are better for company survival than small boards. Further, the change in the BINDEP has a significant negative association with CF in ASE companies. The P-value equal to 0.01 is lower than the 0.05 level of significance, whereas the hazard ratio is 0.10 (95% CI [0.03, 0.35]). This means as the BINDEP increases, the likelihood of a company's financial failure decreases, maintaining its survival. Moreover, the results indicate that DUALITY has an insignificant negative association with CF in ASE companies, while the hazard ratio is equal to 0.71 (95% CI [0.28, 1.78]) and the P-value is equal to 0.46. Thus, the lack of DUALITY impacts the survival of the company. Furthermore, this means that as DUALITY increases, the likelihood of financial failure decreases to 71%. In additional, the result shows that the change in the OWNERS has an

insignificant positive association with CF. While the hazard ratio is 1 (95% CI [0.43, 2.33]), the P-value is 0.05%. This positive association indicates that as the OWNERS increases, the likelihood of financial failure also increases. According to the Cox hazards regression results, OWNERC has an insignificant positive association with financial failure. When the hazard ratio is equal to 1.13 (95% CI [0.69, 1.83]), and the P-value is 0.63, it indicates that as the OWNERC increases, the likelihood of financial failure also increases insignificantly. Moreover, the results indicate that the existence of an AUDIC has an insignificant association with CF in ASE companies. Surprisingly, the hazard ratio is equal to 1.77 (95% CI [0.81, 3.85]). Therefore, there is a positive association between the AUDIC and CF, in that the audit committee negatively impacts the survival of the company. The Cox hazards regression result indicates that changes in the BAGE has a significant negative impact on CF in ASE companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.93 (95% CI [0.90, 0.96]), this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Results also indicate that BGENDER has an insignificant association with CF in ASE companies. Surprisingly, the hazard ratio is equal to 0.01 (95% CI [0, 3.15]); therefore, there is a negative impact of BGENDER on CF, which suggests that it has a positive impact on companies' survival. The results indicate that the change in BEDU has a significant negative impact on CF in ASE companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance and also since the hazard ratio is 0.01 (95% CI [0, 3.15]), it indicates that as the education level of the board increases, the likelihood of financial failure decreases, thereby maintaining company survival. Further, the result indicates that the change in the BACTIV has an insignificant impact on financial distress in ASE companies. Since the P-value of 1 is higher than the 0.05 level of significance and the hazard ratio is equal to 1 (95% CI [0.92, 1.08]), there is a positive association between BACTIV and financial failure. In summary, the survival model includes six CG variables and four BC variables as independent variables, as well as three control variables. In summary, the survival model includes six CG variables and four BC variables as independent variables, as well as three variables as control variables. The results indicate that the variables board size, board independence, board age, board education, firm size, liquidity and profit have a significant impact on CF. However, the variables CEO duality, ownership structure, ownership concentration, audit committee, board gender and board

activity have an insignificant impact on CF. The interpretation of these results will be clarified in the next part of this chapter.

4.2.4 Comparison of Results of Cox hazards Regression Analyses for Palestine Exchange and Amman Stock Exchange

Below, Figure (6) shows the survival curve for Palestine and Jordan as separate groups in the presence of all the current variables.

Figure (6)



Survival Curve for Palestine Exchange and Amman Stock Exchange

According to Figure (6), after the company starts its activity, from 30 to 55 years, the probability of Palestinian companies being exposed to failure risks will be constantly compared to Jordan companies that suffer from a continuous increase in risk during that period. This indicates that there are differences in the impact of CG rules and BC on CF. However, the Cox hazards model was adjusted to compare PEX and ASE, as represented in Appendix Three. There are a few reasons for this results: First, the Jordan market is

three and a half times larger than the Palestine market. Therefore, the results are more accurate and closer in the case of Jordan than in Palestine. . Second, it only focused on the industry and services sectors, excluding other sectors so the results would be more accurate and more generalizable if they included all sectors. Third, the implementation of the CG Code is mandatory in Jordan but optional in Palestine. Therefore, Jordanian companies will be more compliant with its implementation. Finally, Palestine does not have a Palestinian corporate law that takes into account the specifics of the existing situation. Instead, it applies the Jordanian corporate law of 1964. This law is considered old, as it does not take into consideration the scientific progress and development in international standards.

4.3 Results of Log-Likelihood Test

The log-likelihood test results for overall, PEX and ASE with the use of CF as the dependent variable are shown in Table (14), see appendix (A).

The models include six CG variables and four BC variables as independent variables, as well as three variables as control variables. Overall, the value of R^2 for the CG model is equal to 4.8%, which indicates that all of the variables of CG included in the survival model explain 4.8% of the variation in CF. On the other hand, the P-value is equal to 0.001, which indicates that the CG model is significant. In addition, the value of R^2 for the BC model is equal to 5.9%, which suggests that all of the variables of BC included in the survival model explain 5.9% of the variation in CF. The P-value is equal to 1E-04, which indicates that the BC model is significant.

For PEX, the value of R^2 for the CG model is equal to 14.7%, which indicates that all of the variables of CG included in the survival model explain 14.7% of the variation in CF. The P-value is 0.002, which indicates that the CG model is significant. Further, the value of R^2 for the BC model is equal to 14.93%, which indicates that all of the variables of BC included in the survival model explain 14.93% of the variation in CF. The P-value is equal to 0.005, which indicates that the BC model is significant.

For the ASE, the variables of CG included in the survival model explain 7.9% of the variation in the CF since R^2 for this model equals 7.9%. The P-value is equal to 1E-04; this result indicates that the CG model is significant. Moreover, the value of R^2 for the

BC model is equal to 8.4%, which indicates that all of the variables of BC included in the survival model explain 8.4% of the variation in CF. The P-value is equal to 4E-05; this result indicates that the BC model is significant. Finally, the difference between PEX and ASE regarding the impact of CG and BC on CF is significant, as the P-value is equal to 4E-04.

4.4 Results of Statistical Learning

To identify the optimal collection of variables for the classification problem, the statistical learning model can be used to clarify variable significance, as determined by random forests. According to Jebreen and Ghattas' (2016), the relevance of each variable is calculated by averaging over 100 random forest runs. In an embedded increasing random forests model, variables are prioritized in the decreasing order of significance and inserted successively. Ten cross-validations are used to measure the accuracy of each model, and the best number of relevant variables to retain is the one that corresponds to the most correct model. A stepwise approach is used to determine the ideal subset of input variables to be maintained for each classification model. A succession of embedded models was built by starting with the most essential variable and then by adding the others one by one after the input variables were arranged (Jebreen & Ghattas, 2016).

Figure (7)

Important Characteristics of a Survival Model



Figure (7) illustrates the importance of the variables for the CG and BC model as classifiers for CF. The results reflect the importance of the variables to predict CF five years before the failure occurs. The classification process illustrates the relative importance of liquidity, firm size, ownership structure and board age, board independence and profitability as respectively, they are found to be consistent prime predictors of CF. Additionally, the mean square error (MSE) of models is computed by applying cross-validation. The best subset selection of input variables corresponds to the model for reducing the MSE, and thus, the ideal best subset is liquidity to predict CF (crucial to a company's ability to survive), as illustrated in Figure (8).

Figure (8) *Important Company Characteristics for the Failure Category*



Five-folds cross-validation to calculate the ROC is used to measure the classifiers' accuracy. In each scenario, cross-validation is performed 100 times, and the average of these runs is presented (Jebreen & Ghattas, 2019). The ability of a model to distinguish between classes is measured by the ROC curve, as shown in Figure 9, which excludes the impact of random-chance guessing. The area under the ROC curve (AUC) score indicates the percentage of the curve when the True Positive Rate (TP) is higher than the False Positive Rate (FP). The CG and BC must surpass the dashed line in order for research models to be relevant. The further the ROC curve crosses the dashed diagonal, the better is the model's ability to categorize a company into the appropriate category. Therefore, in this study, the AUC of the ROC is equal to 0.84, indicating that the model expects a particular observation to fall into the correct category. In other words, the model does have predictive quality. Therefore, the score shows the likelihood that the model ranks a

randomly chosen positive instance (bankrupt business) higher than a randomly chosen negative instance (healthy company), according to Zhou (2013).



ROC Curve



4.5 Test Hypotheses

This section of the thesis presents the study hypotheses based on statistical analysis on R for overall, PEX and ASE. The results of the study hypotheses are summarized in Table (18), see appendix (A).

4.5.1 Overall Test Hypotheses

In the following sections, the results of all the study hypotheses related to CG and BC for all companies included in this study either listed on the PEX or on the ASE,. However, all results are summarized in Table (15), see appendix (A).

4.5.1.1 Corporate Governance and Financial Failure in Overall

Overall, the value of \mathbb{R}^2 for the CG model is equal to 4.8%, which indicates that all of the variables of CG included in the survival model explain 4.8% of the variation in CF. The P-value is equal to 0.001; this result indicates that the CG model is significant. Thus, HA is accepted. Based on previous studies and theories, the impact of the variables that measured CG has been explained in more detail below.

4.5.1.2 Board Size and Financial Failure in Overall

The results in Table 11 indicate that, for overall, there is a significant negative association between board size and CF. The P-value equal to 0.001 is lower than the 0.05 level of significance when hazard ratio is equal to 0.88. This means that with an increase in board size, the likelihood of CF decreases. In other words, larger boards are better for company survival than small boards. Hence, H_{A1} is accepted. This result could be explained by the argument of Adams and Ferreira (2004) that a large boards of directors have increased diversity in terms of both experiences and knowledge. Accordingly, control and supervisory over the different operations of a company would be enhanced. Furthermore, the company performance would be improved. To conclude, there is a positive impact of board size on the company's survival. This result is consistent with those of Chaganti et al. (1985) and Platt and Platt (2012). On the other hand, it contradicts the results of Bukar et al. (2020), who found that there is a positive association between board size and CF. It also contradicts the results of Lakshan and Wijekoon (2012) and Ciampi (2015), both of which found that there is an insignificant association between board size and CF.

4.5.1.3 Board Independence and Financial Failure in Overall

Further, as Table (11) shows, the overall result indicates the change in the board independence has a significant negative association with CF. The P-value equal to 0.01 is lower than the 0.05 level of significance, whereas the hazard ratio is 0.17. This means as the board's independence increases, the likelihood of a company's financial failure decreases, maintaining its survival. Thus, HA₂ is accepted. Agency theory suggests that board independence is more capable of meeting stakeholders' interests (Jizi et al., 2013). Moreover, it corresponds with the results of a study in Nigeria (Musa, 2020), according to which regulators claim that independent directors are better capable of carrying out crucial roles on the board, thereby reducing agency problems between shareholders and

managers. Uadiale and Fagbemi (2012) reported that boards with a majority of external directors provide companies with more experience years and are in a better position to supervise and regulate managers. According to Fama and Jensen (1983), independent directors lead to more information disclosure, greater transparency and accountability, more information symmetries and a better company image, which lead to company survival. On the other hand, reformers of CG generally argue that the presence of non-independent executive (NED) affiliations reduces the effectiveness of monitoring, as these affiliations may lead to shareholder potential conflicts (Hsu & Wu, 2014). Further, Beasley (1996) showed that corporate financial crime is more likely to occur when the board consists of fewer independent directors. A significant part of the existing literature shows a significant negative association between board independence and CF (e.g., Beasley, 1996; Musa, 2020; Platt & Platt, 2012; Süsi & Lukason, 2019; Uadiale & Fagbemi, 2012). However, this result contradicts those of studies that found a positive association between board independence and CF (e.g., Hsu & Wu, 2014).

4.5.1.4 CEO Duality and Financial Failure in Overall

Moreover, according to Table 11, the overall results indicate that CEO duality has an insignificant positive association with CF, while the hazard ratio is equal to 1.09 and the P-value is equal to 0.83. Thus, CEO duality has an positive insignificant impact on company survival. Furthermore, this means that as CEO duality increases, the likelihood of financial failure increases by 9%. Hence, HA3 is rejected. However, the positive association is in compliance with agency theory, which proposes the isolation of the duties of the CEO and COB to improve the independence of the board in order to effectively perform its role (Donaldson & Davis, 1991). However, Fama and Jensen (1983) claimed that consolidation of decision-making and decision control in one individual decreases the efficiency of the board. Xu et al. (2018) also discouraged such a consolidation, as being the COB and CEO at the same time can influence the motivation of the CEO to commit fraud. CEO duality is also supported by Rajeevan and Ajward (2019) who found a positive association between CEO-chairman duality and earnings management. Moreover, all of these arguments indicate that CEO duality can lead to financial failure. However, this study agrees with Manzaneque et al. (2016) that there is an insignificant association between CEO duality and the likelihood of financial distress. Moreover, this study is similar to Rajeevan and Ajward (2019) in terms of the positive association. Nevertheless, it differs from Ciampi (2015) and Platt and Platt (2012), which found a negative association between CEO duality and CF.

4.5.1.5 Ownership Structure and Financial Failure in Overall

Table 11 shows that the change in the OS has an insignificant positive association with CF. While the hazard ratio is 1.06, the P-value is 0.88. This indicates that as the OS increases, the likelihood of financial failure also increases. So, HA4 is rejected. This positive association found in this study agrees with the result of Mohd Ghazali (2007) that when a company is governed by its owners, the interest of outsiders is overlooked. This, thus, negatively impacts the rights of other shareholders, as the directors will seek to achieve their personal interests through its high percentage of ownership. As the ownership of the board of directors increases, the control over company decisions in terms of voting rights increases. However, the result is inconsistent with agency theory that states, the growing percentage of board ownership may be of importance to both managers and stakeholders. This is likely due to the fact that companies with a larger level of board ownership would better mix the interests of shareholders with managers, resulting in reduced agency costs (Jensen & Meckling, 1976). The results are consistent with the results of Haat et al. (2006) in terms, which found a positive association between greater OS and greater financial risks. However, it is inconsistent with the results of Süsi and Lukason (2019), Bukar et al. (2020), Fama and Jensen (1983) and O'Connor et al. (2006) that found a negative association between ownership structure and CF. Further, it is also inconsistent with the results of Wang and Deng (2006) and Udin et al. (2017) that found an insignificant association between OS and CF.

4.5.1.6 Ownership Concentration and Financial Failure in Overall

According to the Cox hazards regression results in Table 11 for overall, ownership concentration has an insignificant positive association with financial failure. When the hazard ratio is equal to 1.30, and the P-value is 0.23, this means that as the ownership concentration increases, the likelihood of financial failure also increases insignificantly. Thus, HA5 is rejected. This positive association in the current study is explained by Sami et al. (2011), who showed that the concentration level of shareholder ownership can cause some majority shareholders to behave in a way that could influence company performance. For example, by appointing their preferred candidates to roles on the board

and in the top executive staff, majority shareholders may influence the vote of board members and executives on company-related decisions. This increases opportunities for senior managers to control activities. As a result, the majority of shareholders and their interests influence the company's performance and influence company survival. The result of the study is consistent with those of De Miguel et al. (2004) and Demsetz and Villalonga (2001), which found a statistically insignificant association between the concentration of ownership and CF. This study's finding agrees with those of Sami et al. (2011) and Ciampi (2015) in terms of the positive association between the two variables. However, it contradicts the results by Süsi and Lukason (2019), Paniagua et al. (2018) and O'Connor et al. (2006).

4.5.1.7 Audit Committee and Financial Failure in Overall

The overall results in Table 11 indicate that the existence of an audit committee has an insignificant association with CF. Surprisingly, the hazard ratio is equal to 1.50. Therefore, there is a positive association between the audit committee and CF, in that the audit committee negatively impacts the survival of the company. This result indicates that the presence of the audit committee increases the possibility of CF to one and a half times, although insignificantly. Thus, HA6 is rejected. The positive direction of the results contradicts the principle of agency theory, which states that the conflict between owners and agents is caused by a misalignment of interests. Management performance will improve if independent parties such as the audit committee exist. Management is motivated to perform by the audit committee's effectiveness; this notion is supported by Saputri and Asrori (2019). This contradicts the claim that the audit committee was formed is to overhaul the financial system and safeguard the credibility of the financial statements in order to represent the financial transactions; it was also believed that the audit committee had a real and honest vision of shielding companies from the potential risks of default and failure. On the other hand, Widyaningsih (2020) supported that the audit committee could have a negative impact on the company, which may lead to financial distress – give an entity increased control over management, and the publication of quality accounting information will be less than ideal. However, it is also possible that the characteristics of the audit committee have a positive impact on financial failure; not just its presence, according to Kallamu and Saat (2015), factors such as size (e.g., Karamanou & Vafeas, 2005), independence (e.g., Abbott & Parker (2000), tenure (e.g., Aldamen et

al., 2011), financial expertise (e.g., Qin, 2007) and frequency of meetings (e.g., Stewart & Munro, 2007) related to the audit committee also influence a company's survival. The presence of problems among audit committee members may have an impact on the company's financial position. Habib and Bhuiyan (2016) proved that the presence of problems among the directors of the audit committee is associated with real earnings mismanagement and fraudulent reporting practice. Moreover, the finding of this study agrees with those of Beasley (1996) and Hwang and Lin (2008) that there is an insignificant association between audit committee existence and CF. It is also inconsistent with the results of Okpala (2012), Lakshan and Wijekoon (2012) and Nuresa & Hadiprajitno (2013)

4.5.1.8 Board Characteristics and Financial Failure in Overall

The value of R^2 for the BC model equal to 5.9% indicates that all of the variables of BC included in the survival model explain 5.9% of the variation in CF. However, the P-value is equal to 1E-04, which indicates that the BC model is significant. Thus, H_B is accepted. In the following sections, the impact of the variables that measured BC on CF is explained in more detail based on previous studies and theories.

4.5.1.9 Board Age and Financial Failure in Overall

The Cox hazards regression result presented in Table 11 indicates that changes in the board age have a significant negative impact on CF in overall companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.93, this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Thus, H_{B1} is accepted. Consistent with upper echelons theory, the age of senior management teams also has an impact on company performance (Hambrick & Mason, 1984). Moreover, consistent with Xu et al. (2018) and Serfling (2014), this study recommended that senior directors with greater experience are more likely to keep a tight eye on the activities of executives. This finding is also consistent with those of Platt and Platt (2012), Poon et al. (2013), Serfling (2014), Xu et al. (2018) and Süsi and Lukason (2019). However, it contradicts the findings of Ali et al. (2014). It is also inconsistent with the findings of Bunderson and Sutcliffe (2002) and Jhunjhunwala and Mishra (2012) who did not find any significant association between board age and CF.
4.5.1.10 Board Gender and Financial Failure in Overall

Table 11 results also indicate that board gender diversity has an insignificant association with CF in overall companies. Surprisingly, the hazard ratio is equal to 0.06; therefore, there is a negative impact of board gender on financial failure, which shows that it has a positive impact on companies' survival. Thus, HB2 is rejected. This result supports the increased presence of female professionals on the board of directors, as their presence was found to have raised the probability of the company's survival to 6%. This idea is consistent with human cognition theory (Campbell, 1960), information processing theory (Ashby, 1956) and resource dependence theory (Perryman et al., 2016). Additionally, the proponents of agency theory support that female presence may help companies save money, as these individuals may bring fresh perspectives to boards of directors and allow for wise decision-making (Carter et al., 2003). Thus, female presence on the board contributes to the company's survival and keeps it away from failure risks more than a male-only board. The results of the study are in agreement with Adams and Ferreria (2009), Post and Byron (2015), Cumming et al. (2015) and Chen et al. (2018) but in disagreement with Adams and Funk (2012) and Poletti-Hughes and Briano-Turrent (2019). In contrast, Shrader et al. (1997) did not find any significant association.

4.5.1.11 Board Education and Financial Failure in Overall

The results displayed in Table 11 indicate that the change in board education has a significant negative impact on CF in overall companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance and also since the hazard ratio is 0.19, it indicates that as the education level of the board increases, the likelihood of financial failure decreases, thereby maintaining company survival. So, H_{B3} is accepted. This result shows that the holders of higher degrees are the most efficient in the company, as they contribute significantly to the reduction of financial failure risks and that they are more capable of explaining the circumstances and making the best decisions to maintain the company's survival. This finding is supported by upper echelons theory, which indicates that the demographic features of senior managers or boards of directors and company decision-makers have a significant impact on company performance and survival (Carson et al., 2004). The result is also consistent with those of Boden and Nucci (2000), Lin (2000), Ganotakis (2010), Anderson et al. (2011) and Unger et al. (2011), which show that there is a negative association between education and company failure. However, it

is inconsistent with Van Praag (2001), Davidsson and Honig (2003), Bathula (2008) and Mahadeo et al. (2011) that found a higher education degree is associated with higher failure rates. Disagreement was also found with the results of Rose (2007), Fidanoski et al. (2014), Asoni and Sanandaji (2014) and Alessa (2019), according to which there is an insignificant association between educational degree and CF.

4.5.1.12 Board Activity and Financial Failure in Overall

The result in Table (11) indicates that the change in the board activity has an insignificant impact on financial distress in overall companies. Since the P value equal to 0.68 is higher than the 0.05 level of significance, and the hazard ratio is equal to 1.02, there is a positive association between board activity and financial failure. Therefore, board activity can negatively impact the company's survival. This is in fact a shocking result, as it means that the meetings of the board of directors in Palestine and Jordan companies have contributed to an increase in the possibility of company failure to 2%, although insignificantly. Thus, HB4 is rejected. The positive association was supported by Jensen (1993) that showed that board activity is more reactive than proactive, as the board meets more frequently after a bad performance. Jensen (1993) questioned the usefulness of board meetings since, in most cases, the CEO sets the agenda and provides the information to the board members during the meeting. This lack of knowledge may prevent directors from successfully monitoring and assessing the CEO's performance and company's strategy. According to Brick and Chidambaran (2010), an increased board activity, may have a detrimental influence on company value if the motivation behind it was just to comply with regulations and avoid stockholder lawsuits. This finding of a positive association is also consistent with Dissanayke et al. (2017) and Ali and Nasir (2018) but inconsistent with Abubakar et al. (2017) and Mansor et al. (2013).

4.5.1.13 Difference between Palestine Exchange and Amman Stock Exchange

Finally, the difference between PEX and ASE companies regarding the impact of CG and BC on CF is significant, as the P-value is equal to 4E-04. Thus, Hc is accepted. There are a few reasons for this relationship: First, the Jordan market is three and a half times larger than the Palestine market. Therefore, the results are more accurate and closer in the case of Jordan than in Palestine. Second, the study focused on the industry and services sector, excluding other sectors. Third, the implementation of the CG Code is mandatory in Jordan

but optional in Palestine. Therefore, Jordanian companies will be more compliant with its implementation. Finally, Palestine does not have a Palestinian corporate law that takes into account the specifics of the existing situation. Instead, it applies the Jordanian corporate law of 1964. This law is considered old, as it does not take into consideration the scientific progress and development in international standards.

4.5.2 Test Hypotheses for Palestine

This subsection presents the results related to the effect of CG and BC in the PEX only which are summarized in Table (16), see appendix (A).

4.5.2.1 Corporate Governance and Financial Failure in Palestine Exchange

The value of R^2 for the CG model for PEX equal to 14.7% indicates that all of the variables of CG included in the survival model explain 14.7% of the variation in CF. Moreover; the P-value is equal to 0.002, which indicates that the CG model for PEX is significant. Thus, H_A is accepted.

The following subsections present detailed explanations of the impact of the CG variables on CF based on previous studies and theories.

4.5.2.2 Board Size and Financial Failure in Palestine Exchange

Table 12 indicates that, in Palestine, the change in the board size has an insignificant positive impact on financial distress. Since the P-value equal to 0.06 is higher than the 0.05 level of significance, while the hazard ratio is equal to 1.63, it indicates that as the board size increases, the likelihood of financial failure also increases. In other words, smaller boards are better for maintaining company survival as compared to larger boards. Hence, HAI is rejected. According to Jensen (1993), this outcome might be explained by the fact that there are more conflicts of interest among larger boards, and thus, they are more difficult to govern. Supporting this notion, Chaganti et al. (1985) and Jizi et al. (2013) suggest that smaller boards will often serve as better supervisors than large boards. This result is consistent with the results of Lakshan and Wijekoon (2012) and Ciampi (2015), which found that there is an insignificant relationship between board size and CF. Bukar et al. (2020) also found a positive association between board size and CF. In contrast, Chaganti et al. (1985) and Platt and Platt (2012) contradict this result, finding a negative association between board size and CF.

4.5.2.3 Board Independence and Financial Failure in Palestine Exchange

As seen in Table 12, change in board independence has an insignificant positive association with CF in the PEX companies. Since the P-value equal to 0.16 is more than the 0.05 level of significance while the hazard ratio is equal to 1.58, it can be stated that as board independence increases, the probability of CF increases in PEX. Consequently, the probability of company survival reduces. Thus, HA2 is rejected. This result contradicts agency theory, which states that as the board of directors becomes more independent from management, company performance should improve (Fama & Jensen, 1983). This would then positively impact the company's financial position and reduce failure rates. The reasons why this hypothesis has been rejected are the following: First, insiders are argued to be the most effective and efficient directors, as they have more information about the company than outsiders; thus, external directors should rely on them to make decisions. Second, Nicholson and Kiel (2007) argued that "inside directors live in the company they govern, they understand the business better than outside directors, and so can make better judgments". Third, independent directors referred by the inside members of the board may have relationships with the latter, reducing their ability to issue instructions and directions. Finally, Brennan (2006) argued that since many outside directors are part-timers with limited knowledge of the company, they may be unable to accomplish the expected obligations. Such information asymmetry may weaken the independent directors' control and supervising powers, thereby negatively impacting the company's survival. Riyadh et al. (2019) found that there is an insignificant association between board independence and financial distress. An insignificant part of the existing literature shows a positive association between board independence and CF (e.g., Hsu & Wu, 2014). On the other hand, it contradicts the results of Beasley (1996), Uadiale and Fagbemi (2012), Platt and Platt (2012), Süsi and Lukason (2019) and Musa (2020) that found a negative association between board independence and CF.

4.5.2.4 CEO Duality and Financial Failure in Palestine Exchange

According to Table 12, CEO duality has an insignificant positive association with CF in the Palestinian companies since the hazard ratio is equal to 1.28 and the P-value is 0.75. Thus, CEO duality has a negative impact on company survival. Furthermore, this means that as CEO duality increases, the likelihood of financial failure increases by 28%. Hence, HA3 is rejected. The positive association agrees with agency theory that proposes the

isolation of the duties of the CEO and the COB for the improvement of the independence of the board and effectively discharging its role (Donaldson & Davis, 1991). Furthermore, Fama and Jensen (1983) claimed that the consolidation of decision-making and decision control in one individual decreases the efficiency of the board. Xu et al. (2018) asserted that being the COB and CEO at the same time can motivate the CEO to commit fraud. It is also supported by Rajeevan and Ajward (2019) that found a positive association between CEO-Chairman duality and earnings management. All these arguments indicate that CEO duality has a positive impact on financial failure risks. This study agrees with Manzaneque et al. (2016) and Wang and Deng (2006) that found there is an insignificant association between CEO duality and financial distress. This is also consistent with Rajeevan and Ajward (2019). However, it differs from Ciampi (2015) and Platt and Platt (2012) that found a negative association between CEO duality and CF.

4.5.2.5 Ownership Structure and Financial Failure in Palestine Exchange

Table 12 indicates that the change in the ownership structure has an insignificant positive association with CF in Palestinian companies. Since the hazard ratio is equal to 1.16 and the P-value is 0.56, there is a positive association between ownership structure and CF. This means that as the ownership structure increases, the likelihood of financial failure also increases, although insignificantly. So, HA4 is rejected. This positive association result agrees with the findings of Mohd Ghazali (2007) that an entity is governed by its owners, the interest of outsiders reduces. This, thus, negatively impacts the rights of other shareholders, as the directors will seek to achieve their personal interests through its high percentage of ownership. As the ownership of the board of directors increases, the control over company decisions in terms of voting rights also increases. However, the result is inconsistent with agency theory, which states that the growing percentage of board ownership may be of importance to both managers and stakeholders. This is likely due to the fact that companies with a larger level of board ownership would better mix the interests of shareholders with managers, resulting in reduced agency costs (Jensen & Meckling, 1976). The finding is consistent with that of Haat et al. (2006), both of which found a positive association between greater ownership structure and greater financial risks. However, it is inconsistent with the results of Süsi and Lukason (2019), Bukar et al. (2020), Fama and Jensen (1983) and O'Connor et al. (2006), all of which found a negative association between ownership structure and CF. Further, it is also inconsistent with the results of Wang and Deng (2006) and Udin et al. (2017) that found an insignificant association between ownership structure and CF.

4.5.2.6 Ownership Concentration and Financial Failure in Palestine Exchange

According to the Cox hazards regression results in Table 12 for PEX, ownership concentration has a significant positive association with financial failure. When the hazard ratio equals to 3.40 and the P value is 0.40, it indicates that as the ownership concentration increases, the likelihood of financial failure also increases (three and a half times). Thus, HA5 is accepted. This positive association in the current study is explained by Sami et al. (2011), who showed that the concentration level of shareholder ownership can cause some majority shareholders to act in a way that could influence company performance. For example, by appointing their preferred candidates to roles on the board and in the top executive staff, majority shareholders may influence the vote of board members and executives on company-related decisions. This increases opportunities for senior managers to control activities. As a result, the majority of shareholders and their interests influence the company's performance and influence company survival. This study's finding agrees with those of Sami et al. (2011) and Ciampi (2015) in terms of the positive association between the two variables. However, it contradicts the results by Süsi and Lukason (2019), Paniagua et al. (2018) and O'Connor et al. (2006). However, the result is inconsistent with those of De Miguel et al. (2004) and Demsetz and Villalonga (2001), which found a statistically insignificant association between the concentration of ownership and CF.

4.5.2.7 Audit Committee and Financial Failure in Palestine Exchange

The results in Table 12 related to PEX indicate that the existence of an audit committee has an insignificant association with CF. Surprisingly, the hazard ratio is equal to 1.23. Therefore, there is a positive association between the audit committee and CF, in that the audit committee negatively impacts the survival of the company. This shocking result indicates that the audit committee increases the possibility of CF, although insignificantly. Thus, HA6 is rejected. The positive direction of the results contradicts the principle of agency theory, which states that the conflict between owners and agents is caused by a misalignment of interests. Management performance will improve if independent parties such as the audit committee exist. Management is motivated to

perform by the audit committee's effectiveness; this notion is supported by Saputri and Asrori (2019). This contradicts the claim that the audit committee was formed is to overhaul the financial system and safeguard the credibility of the financial statements in order to represent the financial transactions; it was also believed that the audit committee had a real and honest vision of shielding companies from the potential risks of default and failure. On the other hand, Widyaningsih (2020) supported the idea that the audit committee could have a negative impact on the company, which may lead to financial distress-give an entity increased control over management, and the publication of quality accounting information will be less than ideal. However, it is also possible that the characteristics of the audit committee have a positive impact on financial failure; not just its presence, according to Kallamu and Saat (2015), factors such as size (e.g., Karamanou & Vafeas, 2005), independence (e.g., Abbott & Parker (2000), tenure (e.g., Aldamen et al., 2011), financial expertise (e.g., Qin, 2007) and frequency of meetings (e.g., Stewart & Munro, 2007) related to the audit committee also influence a company's survival. The presence of problems among audit committee members may have an impact on the company's financial position. Habib and Bhuiyan (2016) proved that the presence of problems among the directors of the audit committee is associated with real earnings management and fraudulent reporting practice. Among the important reasons for the existence of a positive relationship between the presence of an audit committee and CF, is that most of the companies in the Palestinian market are family companies that follow the control of the royal family, which controls all the company's decisions. Therefore, the audit committee will be limited to a formal presence only. Moreover, the finding of this study agrees with those of Beasley (1996) and Hwang and Lin (2008) that there is an insignificant association between audit committee existence and CF. It is also inconsistent with the results of Okpala (2012), Lakshan and Wijekoon (2012).

4.5.2.8 Board Characteristics and Financial Failure in Palestine Exchange

The value of R^2 for the BC model equal to 14.93% indicates that all of the variables of BC included in the survival model explain 14.93% of the variation in CF. However, the P-value is equal to 0.005, which indicates that the BC model is significant. Thus, H_B is accepted. In the following sections, the impact of the variables that measured BC on CF is explained in more detail based on previous studies and theories.

4.5.2.9 Board Age and Financial Failure in Palestine Exchange

The Cox hazards regression result presented in Table (12) indicates that changes in the board age have a significant negative impact on CF in the PEX companies. Since the P-value equal to 0.02 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.49, this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Thus, HB1 is accepted. Consistent with upper echelons theory, the age of senior management teams also has an impact on company performance (Hambrick & Mason, 1984). Moreover, consistent with Xu et al. (2018) and Serfling (2014), this study recommended that senior directors with greater experience are more likely to keep a tight eye on the activities of executives. This finding is also consistent with those of Platt and Platt (2012), Poon et al. (2013), Serfling (2014), Xu et al. (2018) and Süsi and Lukason (2019). However, it contradicts the findings of Ali et al. (2014). It is also inconsistent with the findings of Bunderson and Sutcliffe (2002) and Jhunjhunwala and Mishra (2012) who did not find any significant association between board age and CF.

4.5.2.10 Board Gender and Financial Failure in Palestine Exchange

Table (12) results also indicate that board gender diversity has an insignificant association with CF in Palestinian companies. Surprisingly, the hazard ratio is equal to 1.1; therefore, there is an insignificant positive impact of board gender on financial failure, which shows that it has a negative impact on companies' survival. Thus, HB2 is rejected. This result discourages the presence of female professionals on the board of directors, as their presence was found to have decreased the probability of the company's survival. The theory of diversity explains this result, as the theory states that individuals are drawn to those with whom they share characteristics; greater similarities are likely to lead to shared outcomes, fewer differences and conflicts, higher levels of commitment and cohesiveness, trust and social integration. Thus, interactions between people who are similar to each other make it easier to achieve an agreement and make choices quickly (Harrison & Klein, 2007). This, thus, impacts the survival and success of the company. The study results are in agreement with Adams and Funk (2012) and Poletti-Hughes and Briano-Turrent (2019). However, it contradicts Adams and Ferreria (2009), Post and Byron (2015), Cumming et al. (2015) and Chen et al. (2018). Further, Shrader et al. (1997) did not find significant results.

4.5.2.11 Board Education and Financial Failure in Palestine Exchange

The results displayed in Table (12) indicate that the change in board education has a significant positive impact on CF in the PEX companies. Since the P-value equal to 0.001 is lower than the 0.02 level of significance and also since the hazard ratio is 1.90, it indicates that as the education level of the board increases, the likelihood of financial failure increases, thereby negatively impacting company survival. So, HB3 is accepted. This result of positive association differs from what was explained in upper echelon theory (Hambrick & Mason, 1984). Nevertheless, consistent with Bathula (2008), the presence of PhD-qualified individuals on a board is negatively associated with the company's success, and even with knowledge and abilities in analysis and research, PhD members appear to offer little value to the improvement of company performance. Moreover, the result is consistent with Van Praag (2001), Davidsson and Honig (2003), Bathula (2008) and Mahadeo et al. (2011) that found an education degree is associated with higher failure rates. Moreover, the result is inconsistent with Boden and Nucci (2000), Lin et al. (2000), Ganotakis (2010), Anderson et al. (2011) and Unger et al. (2011) that found a negative association between education and company failure. Moreover, the result also disagrees with the studies of Rose (2007), Fidanoski et al. (2014), Asoni and Sanandaji (2014) and Alessa (2019) that found an insignificant relationship between CF and educational degree.

4.5.2.12. Board Activity and Financial Failure in Palestine Exchange

The result in Table (12) indicates that the change in the board activity has a significant impact on financial distress in the PEX companies. Hazard ratio is equal to 1.74, board activity has a positive impact on financial failure. Therefore, board activity can negatively impact the company's survival. This is in fact a shocking result, as it means that the meetings of the board of directors in Palestinian companies have contributed to an increase in the possibility of company failure. Thus, HB4 is accepted. The positive association was supported by Jensen (1993), who stated that board activity is more reactive than proactive, as the board meets more frequently after a bad performance. Jensen (1993) questioned the usefulness of board meetings since, in most cases, the CEO sets the agenda and provides the information to the board members during the meeting. This lack of knowledge may prevent directors from successfully monitoring and assessing the CEO's performance and company's strategy. According to Brick and Chidambaran

(2010), an increased board activity, may have a detrimental influence on company value if the motivation behind it was just to comply with regulations and avoid stockholder lawsuits.. This finding of a positive association is also consistent with Dissanayke et al. (2017) and Ali and Nasir (2018) but inconsistent with Abubakar et al. (2017) and Mansor et al. (2013).

4.5.3 Test Hypotheses for Amman Stock Exchange

In the following sections, the results of all the test hypotheses related to CG and BC for ASE companies have been presented. All results are summarized in Table (17), see appendix (A).

4.5.3.1 Corporate Governance and Financial Failure in Amman Stock Exchange

For ASE, the value of R^2 for the CG model is equal to 7.9%, which indicates that all of the variables of CG included in the survival model explain 7.9% of the variation in CF. The value of P-value is equal to 1E-04; this result indicates that the CG model is significant. Thus, H_A is accepted. Based on previous studies and theories, the impact of the variables that measured CG has been explained in more detail below.

4.5.3.2 Board Size and Financial Failure in Amman Stock Exchange

The results in Table 13 indicate that there is a significant negative association between board size and CF in companies in Jordan. The P-value equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.84. This means that with an increase in board size, the likelihood of CF decreases. In other words, larger boards are better for company survival than small boards. Hence, HA1 is accepted. This result could be explained by Adams and Ferreira (2004) who argued that a large board of directors has increased diversity in terms of both experiences and knowledge.

Since the diversity of expertise represents control and supervisory cover for the work of all sectors of the company, this serves the company in all fields, and the company performance improves. This, as a result, has a positive impact on the company's survival. This result is consistent with those of Chaganti et al. (1985) and Platt and Platt (2012). On the other hand, it contradicts the results of Bukar et al. (2020), who found that there is a positive association between board size and CF. It also contradicts the results of

Lakshan and Wijekoon (2012) and Ciampi (2015), both of which found that there is an insignificant association between board size and CF.

4.5.3.3 Board Independence and Financial Failure in Amman Stock Exchange

Further, as Table 13 shows, the change in the board independence has a significant negative association with CF in ASE companies. The P-value equal to 0.01 is lower than the 0.05 level of significance, whereas the hazard ratio is 0.10. This means as the board's independence increases, the likelihood of a company's financial failure decreases, maintaining its survival. Thus, HA2 is accepted. Agency theory suggests that board independence is more capable of meeting stakeholders' interests (Jizi et al., 2013). Moreover, it corresponds with the results of a study in Nigeria (Musa, 2020), according to which regulators claim that independent directors are better capable of carrying out crucial roles on the board, thereby reducing agency problems between shareholders and managers. Uadiale and Fagbemi (2012) reported that boards with a majority of external directors provide companies with more experience years and are in a better position to supervise and regulate managers. According to Fama and Jensen (1983), independent directors lead to more information disclosure, greater transparency and accountability, more information symmetries and a better company image, which lead to company survival. On the other hand, reformers of CG generally argue that the presence of NED affiliations reduces the effectiveness of NED monitoring, as these affiliations may lead to shareholder potential conflicts (Hsu & Wu, 2014). Further, Beasley (1996) showed that corporate financial crime is more likely to occur when the board consists of fewer independent directors. A significant part of the existing literature shows a significant negative association between board independence and CG (e.g., Beasley, 1996; Lukason & Süsi, 2019; Musa, 2020; Platt & Platt, 2012; Uadiale & Fagberni, 2012). However, this result contradicts those of studies that found a positive association between board independence and CG (e.g., Hsu & Wu, 2014).

4.5.3.4 CEO Duality and Financial Failure in Amman Stock Exchange

Moreover, according to Table 13, CEO duality has an insignificant negative association with CF in ASE companies, while the hazard ratio is equal to 0.71 and the P-value is equal to 0.46. Thus, the lack of CEO duality impacts the survival of the company. Furthermore, this means that as CEO duality increases, the likelihood of financial failure decreases to 71%. Hence, HA3 is rejected. However, this result is inconsistent with agency theory, which proposes the isolation of the duties of the CEO and COB to improve the independence of the board in order to effectively perform its role (Donaldson & Davis, 1991). However, this finding was supported by the stewardship theories that contend that the consolidation of two roles in one employee should increase the success of the company, as such an arrangement removes all internal and external uncertainties related to accountability for company procedures and outcomes (Finkelstein & D'aveni, 1994). This study agrees with Manzaneque et al. (2016) and Wang and Deng (2006) that there is an insignificant association between CEO duality and the likelihood of financial distress, as well as Ciampi (2015) and Platt and Platt (2012) in terms of the negative association. Nonetheless, this study contradicts the findings of Rajeevan and Ajward (2019).

4.5.3.5 Ownership Structure and Financial Failure in Amman Stock Exchange

Table 14 shows that the change in the ownership structure has an insignificant positive association with CF. While the hazard ratio is 1, the P-value is 0.05%. This positive association indicates that as the ownership structure increases, the likelihood of financial failure also increases. So, HA4 is rejected. This positive association found in this study agrees with the result of Mohd Ghazali (2007) that when a company is governed by its owners, the interest of outsiders is overlooked. This, thus, negatively impacts the rights of other shareholders, as the directors will seek to achieve their personal interests through its high percentage of ownership. As the ownership of the board of directors increases, the control over company decisions in terms of voting rights increases.

However, the result is inconsistent with agency theory that states the growing percentage of board ownership may be of importance to both managers and stakeholders. This is likely due to the fact that companies with a larger level of board ownership would better mix the interests of shareholders with managers, resulting in reduced agency costs (Jensen & Meckling, 1976). The finding is consistent with that of Haat et al. (2006), both of which found a positive association between greater ownership structure and greater financial risks. However, it is inconsistent with the results of Süsi and Lukason (2019), Bukar et al. (2020), Fama and Jensen (1983) and O'Connor et al. (2006) that found a negative association between ownership structure and CF. Further, it is also inconsistent with the results of Wang and Deng (2006) and Udin et al. (2017) that found an insignificant association between ownership structure and CF.

4.5.3.6 Ownership Concentration and Financial Failure in Amman Stock Exchange

According to the Cox hazards regression results in Table 13 for ASE companies, ownership concentration has an insignificant positive association with financial failure. When the hazard ratio is equal to 1.13, and the P-value is 0.63, it indicates that as the ownership concentration increases, the likelihood of financial failure also increases insignificantly. Thus, HA5 is rejected. This positive association in the current study is explained by Sami et al. (2011), who showed that the concentration level of shareholder ownership can cause some majority shareholders to behave in a way that could influence company performance. For example, by appointing their preferred candidates to roles on the board and in the top executive staff, majority shareholders may influence the vote of board members and executives on company-related decisions. This increases opportunities for senior managers to control activities. As a result, the majority of shareholders and their interests influence the company's performance and influence company survival. The result of the study is consistent with those of De Miguel et al. (2004) and Demsetz and Villalonga (2001), which found a statistically insignificant association between the concentration of ownership and CF. This study's finding agrees with those of Sami et al. (2011) and Ciampi (2015) in terms of the positive association between the two variables. However, it contradicts the results by Süsi and Lukason (2019), Paniagua et al. (2018) and O'Connor et al. (2006).

4.5.3.7 Audit Committee and Financial Failure in Amman Stock Exchange

The data in Table 13 indicate that the existence of an audit committee has an insignificant association with CF in ASE companies. Surprisingly, the hazard ratio is equal to 1.77. Therefore, there is a positive association between the audit committee and CF, in that the audit committee negatively impacts the survival of the company. This result indicates that

the presence of the audit committee increases the possibility of CF, although insignificantly. Thus, HA6 is rejected. The positive direction of the results contradicts the principle of agency theory, which states that the conflict between owners and agents is caused by a misalignment of interests. Management performance will improve if independent parties such as the audit committee exist. Management is motivated to perform by the audit committee's effectiveness; this notion is supported by Saputri and Asrori (2019). This contradicts the claim that the audit committee was formed is to overhaul the financial system and safeguard the credibility of the financial statements in order to represent the financial transactions; it was also believed that the audit committee had a real and honest vision of shielding companies from the potential risks of default and failure. On the other hand, Widyaningsih (2020) supported that the audit committee could have a negative impact on the company, which may lead to financial distress – give an entity increased control over management, and the publication of quality accounting information will be less than ideal. However, it is also possible that the characteristics of the audit committee have a positive impact on financial failure; not just its presence, according to Kallamu and Saat (2015), factors such as size (e.g., Karamanou & Vafeas, 2005), independence (e.g., Abbott & Parker (2000), tenure (e.g., Aldamen et al., 2011), financial expertise (e.g., Qin, 2007) and frequency of meetings (e.g., Stewart & Munro, 2007) related to the audit committee also influence a company's survival. The presence of problems among audit committee members may have an impact on the company's financial position. Habib and Bhuiyan (2016) proved that the presence of problems among the directors of the audit committee is associated with real earnings management and fraudulent reporting practice. Moreover, the finding of this study agrees with those of Beasley (1996) and Hwang and Lin (2008) that there is an insignificant association between audit committee existence and CF. It is also inconsistent with the results of Okpala (2012), Lakshan and Wijekoon (2012) and Nuresa & Hadiprajitno (2013)).

4.5.3.8 Board Characteristics and Financial Failure in Amman Stock Exchange

The value of R^2 for the BC model in ASE companies equal to 8.4% indicates that all of the variables of BC included in the survival model explain 8.4% of the variation in CF. However; the P-value is equal to 4E-05, which indicates that the BC model is significant. Thus, H_B is accepted. In the following sections, the impact of the variables that measured

BC on CF for ASE companies has been explained in more detail based on previous studies and theories.

4.5.3.9 Board Age and Financial Failure in Amman Stock Exchange

The Cox hazards regression result presented in Table 11 indicates that change in the board age has a significant negative impact on CF in ASE companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance when the hazard ratio is equal to 0.93, this means that when the members of the board are older, the probability of the company's survival increases, and consequently, the failure rate decreases. Thus, HB1 is accepted. Consistent with upper echelons theory, the age of senior management teams also has an impact on company performance (Hambrick & Mason, 1984). Moreover, consistent with Xu et al. (2018) and Serfling (2014), this study recommended that senior directors with greater experience are more likely to keep a tight eye on the activities of executives. This finding is also consistent with those of Platt and Platt (2012), Poon et al. (2013), Serfling (2014), Xu et al. (2018) and Süsi and Lukason (2019). However, it contradicts the findings of Ali et al. (2014). It is also inconsistent with the findings of Bunderson and Sutcliffe (2002) and Jhunjhunwala and Mishra (2012) who did not find any significant association between board age and CF.

4.5.3.10 Board Gender and Financial Failure in Amman Stock Exchange

Table 13 results also indicate that board gender diversity has an insignificant association with CF in ASE companies. Surprisingly, the hazard ratio is equal to 0.01; therefore, there is a negative impact of board gender on financial failure, which suggests that it has a positive impact on companies' survival. Thus, HB2 is rejected. This result supports the presence of female professionals on the board of directors, as their presence was found to have raised the probability of the company's survival to 1%. This result is consistent with human cognition theory (Campbell, 1960), information processing theory (Ashby, 1956) and resource dependence theory (Perryman et al., 2016). Additionally, the proponents of agency theory support that female presence may help companies save money, as these individuals may bring fresh perspectives to boards of directors and allow for wise decision-making (Carter et al., 2003). Thus, female presence on the board contributes to the company's survival and prevents failure risks more than a male-only board. The results of the study are in agreement with Adams and Ferreria (2009), Post and Byron

(2015), Cumming et al. (2015) and Chen et al. (2018) but in disagreement with Adams and Funk (2012) and Poletti-Hughes and Briano-Turrent (2019). In contrast, Shrader et al. (1997) did not find any significant association

4.5.3.11 Board Education and Financial Failure in Amman Stock Exchange

The results displayed in Table 13 indicate that the change in board education has a significant negative impact on CF in ASE companies. Since the P-value equal to 0.001 is lower than the 0.05 level of significance and also since the hazard ratio is 0.01, it indicates that as the education level of the board increases, the likelihood of financial failure decreases, thereby maintaining company survival. So, HB3 is accepted. This result of a negative association between education and CF indicates that the holders of higher degrees are the most efficient in the company, as they contribute significantly to the reduction of financial failure risks and that they are more capable of explaining the circumstances and making the best decisions to maintain the company's survival. This finding is supported by upper echelons theory, which indicates that the demographic features of senior managers or boards of directors and company decision-makers have a significant impact on company performance and survival (Carson et al., 2004). The result is also consistent with those of Rose (2007) and Fidanoski et al. (2014), Asoni and Sanandaji (2014) and Alessa (2019) that found an insignificant relationship between CF and educational degree. The negative direction result is also consistent with Boden and Nucci (2000), Lin et al. (2000), Ganotakis (2010), Anderson et al. (2011) and Unger et al. (2011) that found a negative association between education and company failure. However, it is inconsistent with Van Praag (2001), Davidsson and Honig (2003), Bathula (2008) and Mahadeo et al. (2011) that found a higher education degree is associated with higher failure rates.

4.5.3.12 Board Activity and Financial Failure in Amman Stock Exchange

The results in Table (13) indicate that the change in the board activity has an insignificant impact on financial distress in ASE companies. Since the P-value of 1 is higher than the 0.05 level of significance and the hazard ratio is equal to 1, there is a positive association between board activity and financial failure. Therefore, board activity can negatively impact the company's survival. Thus, HB4 is rejected. The positive association was supported by Jensen (1993) that showed that board activity is more reactive than

proactive, as the board meets more frequently after a bad performance. Jensen (1993) questioned the usefulness of board meetings since, in most cases, the CEO sets the agenda and provides the information to the board members during the meeting. This lack of knowledge may prevent directors from successfully monitoring and assessing the CEO's performance and company's strategy. According to Brick and Chidambaran (2010), an increased board activity, may have a detrimental influence on company value if the motivation behind it was just to comply with regulations and avoid stockholder lawsuits. This finding of a positive association is also consistent with Dissanayke et al. (2017) and Ali and Nasir (2018) but inconsistent with Abubakar et al. (2017) and Mansor et al. (2013).

Chapter Five Conclusion and Recommendations

5.1 Overview

In this chapter, the conclusion and recommendations of the study have been presented; It also discusses the limitations and originality of the study, followed by some suggestions for future studies.

5.2 Conclusion

This study aimed to predict the CF of the companies listed on the PEX and the ASE using a statistical method, using R. Further, the study examined the impact of CG and BC on CF. CG includes variables such as board size, board independence, CEO duality, ownership structure, ownership concentration and the presence of an audit committee. While the BC were measured by board age, board gender, board education and board activity. Additionally, firm size, liquidity and profitability were used as control variables. The sample included 21 Palestinian and 75 Jordanian companies from the industrial and services companies. The study adopted the survival methodology and Cox hazards regression analysis to test the study hypotheses.

Result indicate that approximately 10% of companies were classified as failed in Palestine and Jordan in 2019. The CG variables included in the survival analysis for overall, PEX and ASE were found to explain 4.8%, 14.7% and 7.9% of the variation in CF, respectively. On the other hand, BC variables included in the survival analysis for overall, PEX and ASE explained 5.9%, 14.9% and 8.45% of the variation in CF. The significant difference between PEX and ASE with regard to the impact of CG and BC on CF is equal to 8.2%. Moreover, the overall results indicate that board size, board independence, board age, board education, firm size, liquidity and profitability is significantly negatively associated with CF and, thus, increase the possibility of company survival. However, the results for Palestine indicated a significant positive association of ownership concentration, board education and board activity with CF. In contrast, there is a significant negative association between profitability and CF. However, there is a significant positive association between CF and board size, board independence, board age, board education, firm size and liquidity. These results revealed the important variables that impact financial failure. Thus, these variables help Palestinian and Jordanian companies to avoid the risks of CF in order to maintain company survival. The findings of this study are beneficial for local and foreign investors to evaluate financially distressed companies on the basis of CG and BC. In addition, it will help decision-makers and external auditors (e.g., the Big Four and other CPAs) to improve the company and avoiding risks that may lead CF. Also, be essential for policymakers and regulators (Capital Market Authority, PEX and ASE) in formulating new policies regarding CG and BC. Moreover, this study is considered a model that encourages researchers to use the RStudio program in their research.

5.3 Recommendations

This study clearly demonstrates that there is a difference in the nature of the relationships between the study variables and CF for Palestinian and Jordanian companies: while for Jordanian companies, there seemed to be more negative relationships between the variables and financial failure, in Palestine, there were more positive relationships between them. The study provides the following reasons for these differences: First, the Jordan market is three and a half times larger than the Palestine market. Therefore, the results are more accurate in the case of Jordan than in Palestine. Second, the study sample was limited to the industrial and service sectors, and other sectors excluded. If the study included all sectors, the results would be more accurate and more generalizable to all companies from different sectors. Third, the implementation of the CG Code is considered mandatory in Jordan, while it is optional in Palestine. Therefore, Jordanian companies will be more compliant with the regulations. Finally, emphasis on the idea that is being implemented in the State of Palestine now, which is the application of a special Palestinian law that takes into account all the political, economic and legal factors of the state. Rather, it adopts the Jordanian corporate law in 1964 (Code of CG in Palestine, 2009) which, being an old law, does not take into consideration of the scientific progress and development in international standards.Based on all these discussions and the study findings, the present researcher provides the following recommendations:

 The study emphasises the need for the mandatory application of the CG Code in Palestine. Moreover, efforts must be directed towards updating the Code of CG rules for Palestine and Jordan by the Capital Market Authority to include more clear and transparent details regarding board members and their diversity in terms of number, age, gender, education and experience.

- 2. Regulators and policymakers are encouraged to devise an official CG index that can be used to evaluate and compare CG practices among companies. Establishing such an index with an official CG recognition for companies with the best application of CG practice can enhance companies' awareness of CG and motivate them to engage more in this area.
- 3. During the stage of data collection, the researcher could not easily access information related to the BC variables in the Palestinian financial reports, so the study recommends that companies should be obligated to disclose all information related to board members such as age, educational qualification, experience and rotation, in addition to the percentage of ownership. Regarding the percentage of ownership, the researcher noted that in most reports the ownership of directors is disclosed in the form of the "number of shares" and not a "percentage of ownership of the total shares". Disclosure of the percentage of ownership, and not the number of shares, helps investors who are not experts in finance to better understand and evaluate the company's position.
- 4. According to the Jordanian Corporation Law of 1964 and the CG Code, the board of directors should include a minimum of 5 and a maximum of 11 members. Thus, regulators should pay greater attention to the passed legislation for the appropriate board size, as the current average number of board members in Palestine and Jordan listed companies is nearly equal to 8 (minimum 4 and maximum 15 members).
- 5. The establishment of decisive control and laws by the Capital Market Authority regarding CEO duality can help preserve the rights of minorities from the personal interests of the managers. Further, formulating standards by the legal and regulatory environment can reinforce and clarify the concept of independence.
- 6. A specific range for the maximum percentage of investment in the company should be determined such that the shareholding percentage does not exceed 49.9% for the shareholder and his relatives. This would ensure that the company's decisions are not controlled by the owner of the largest percentage.

- 7. A supervisory and effective body in the Capital Market Authority should be set up to monitor the work of the audit committee. In addition, laws stipulating specific and binding tasks for the audit committee should be formulated to truly activate the potential of the audit committees, from ensuring transparency in selecting members of the committee to increase the number of meetings.
- 8. It must be ensured that there is diversity in the composition of the board of directors, with a mix of young and older and more experienced professionals such that there is an integrated, balanced system in place: wise opinions tending towards reservation and rationality based on practical experience from the more experienced group and reasonably high-risk initiatives of the younger group.
- 9. The need for the corporate governance code to indicate the need for members to go to educational and training bodies of strength and quality, while working to review the details of the certificates in a serious and objective manner, with the need for research areas to enrich the work and decisions of the board of directors
- 10. It must be ensured that effective and a sufficient number of meetings of the board of directors are held such that all issues are discussed. An increased focus on discussing the company's financial strategy should be achieved by allocating a few meetings to this issue, with the largest possible number of members with financial experience as attendees to maintain the company's continuity in competition.

5.4 Originality/Implication

The first implication of this study is that investors can use the study findings to evaluate financially distressed companies on the basis of CG and BC. Second, this study will help decision-makers avoid risks that may lead to the failure of the company, thereby improving the probability of company survival. Third, it is beneficial for regulatory authorities in formulating new policies regarding CG and BC. Fourth, this study is considered one of the first works in the field of management and business to use the R language and the R studio program for statistical analysis. Thus, this study can serve as a model to encourage researchers to use this approach in their studies. Finally, this study combines behavioural theories, management science and economics.

5.5 Limitations

This study has several limitations. The first is the difference in the sizes of the data between Palestine and Jordan companies, as the Jordanian market is much larger than the Palestinian market; thus, the results for ASE are more accurate. Second, there is no agreement on the specific CG index used. Third, the study does not include all BC that were studied in previous research, with the exclusion of experience and tenure, due to the lack of information in most financial reports (especially those of Palestinian companies).

5.6 Future Research

To complement and develop the results of this study, future studies are encouraged to focus on more factors that may impact CF, especially during the current crisis of COVID-19. Furthermore, the study provides the following recommendations to future researchers:

- Discover the association between audit committee characteristics and CF (existence, size, independence, tenure, expertise and meeting) of companies in Palestine and Jordan.
- Identify the relationship between CEO or executive characteristics and CF in PEX and ASE companies.
- 3. Discover the association between corporate social responsibility strategies and financial failure in PEX and ASE companies, as several studies in the literature have concluded that a strategic approach to stakeholder management can have a negative impact on CF.
- 4. Use artificial intelligence methods to predict a company's failure in Palestine and Jordan.

Abbreviation	Definition
ASE	Amman Stock Exchange
AUDITC	Audit committee
BACTIV	Board activity insanity
BAGE	Board age
BC	Board characteristics
BEDU	Board education
BGENDER	Board gender diversity
BINDEP	Board independence
BSIZE	Board size
CEO	Chief executive officer
CF	Corporate failure
CG	Corporate governance
DUALITY	CEO duality
FSIZE	Firm size
LIQUD	Liquidity
OWNERC	Ownership concentration
OWNERS	Ownership structure
PEX	Palestine Securities Exchange
PROFIT	Profitability

List of Abbreviations

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Appendices

Appendix (A): Tables

Table (8)

Overall Descriptive Statistics for the Period from 2015 to 2019

Variable	2015	2016	2017	2018	2019
Market					
ASE	75 (78.1%)	75 (78.1%)	75 (78.1%)	75 (78.1%)	75 (78.1%)
PEX	21 (21.9%)	21 (21.9%)	21 (21.9%)	21 (21.9%)	21 (21.9%)
Total	96 (100%)	96 (100%)	96 (100%)	96 (100%)	96 (100%)
CF					
0	75 (78.9%)	74 (77.1%)	75 (78.1%)	66 (68.8%)	86 (89.6%)
1	20 (21.1%)	22 (22.9%)	21 (21.9%)	30 (31.2%)	10 (10.4%)
Total	95 (100%)	96 (100%)	96 (100%)	96 (100%)	96 (100%)
BSIZE					
n (miss)	96 (1)	96 (0)	96 (0)	96 (0)	96 (0)
$Mean \pm Std\text{-}Dev$	8.4 ± 2.6	8.3 ± 2.5	8.4 ± 2.6	8.6 ± 2.5	8.3 ± 2.5
Median (Q1- Q3)	8 (7–10)	7 (7–10)	7.5 (7–10.25)	9 (7–10.25)	8 (7–10)
Min, Max	4, 15	5, 15	5, 15	5, 15	4, 13
BINDEP	O(1)	06 (0)	06 (0)		06 (0)
II (IIIISS)	96 (1)	90(0)	96 (0)	96 (0)	96 (0)
Median $(\Omega)_{-}$	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
Q3)	1 (0.86–1)	0.93 (0.86–1)	1 (0.86–1)	0.97 (0.86–1)	1 (0.86–1)
Min, Max	0.4, 1	0.1, 1	0.1, 1	0.1, 1	0, 1
DUALITY					
0	8 (8.4%)	10 (10.4%)	4 (4.2%)	4 (4.2%)	6 (6.2%)
1	87 (91.6%)	86 (89.6%)	92 (95.8%)	92 (95.8%)	90 (93.8%)
Total	95 (100%)	96 (100%)	96 (100%)	96 (100%)	96 (100%)
OWNERS					
n (miss)	96 (5)	96 (5)	96 (5)	96 (5)	96 (5)
$Mean \pm Std\text{-}Dev$	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.4 ± 0.3
Median (Q1- Q3)	0.45 (0.23– 0.71)	0.43 (0.24– 0.71)	0.48 (0.26– 0.71)	0.5 (0.27– 0.73)	0.47 (0.22– 0.69)
Min, Max	0, 1	0, 1	0, 1	0, 1	0, 1
OWNERC					
0	67 (71.3%)	67 (70.5%)	67 (69.8%)	65 (67.7%)	65 (68.4%)
1	27 (28.7%)	28 (29.5%)	29 (30.2%)	31 (32.3%)	30 (31.6%)
Total	94 (100%)	95 (100%)	96 (100%)	96 (100%)	95 (100%)
AUDITC					
0	20 (21.7%)	17 (18.3%)	10 (10.4%)	10 (10.4%)	9 (9.4%)
1	72 (78.3%)	76 (81.7%)	86 (89.6%)	86 (89.6%)	87 (90.6%)
Total	92 (100%)	93 (100%)	96 (100%)	96 (100%)	96 (100%)

Variable	2015	2016	2017	2018	2019
BAGE					
n (miss)	96 (4)	96 (3)	96 (3)	96 (3)	96 (3)
Mean \pm Std-Dev	55.8 ± 7.4	55.9 ± 7.6	57.1 ± 7.2	56.4 ± 7.6	57 ± 7.4
Median (Q1-	55.6 (50.36–	54.9 (49.92–	57 3 (52–61 7)	55.6 (50.86–	57 (51.43–
Q3)	60.6)	60.7)	57.5 (52 01.7)	61.3)	62.3)
Min, Max	39.4, 74.8	40.4, 74.2	41.4, 76.7	39.7, 78.4	40.2, 76.3
BGENDER					
n (miss)	96 (1)	96 (0)	96 (0)	96 (0)	96 (1)
Mean ± Std-Dev	0 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1
Median (Q1– Q3)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)
Min, Max	0, 0.4	0, 0.4	0, 0.4	0, 0.4	0, 0.3
BEDU					
n (miss)	96 (2)	96 (2)	96 (2)	96 (2)	96 (3)
$Mean \pm Std\text{-}Dev$	0.4 ± 0.2	0.4 ± 0.2	0.4 ± 0.2	0.4 ± 0.2	0.4 ± 0.2
Median (Q1– Q3)	0.37 (0.2–0.53)	0.38 (0.21– 0.47)	0.39 (0.24– 0.5)	0.4 (0.22– 0.45)	0.4 (0.23– 0.5)
Min, Max	0, 0.9	0, 0.9	0, 1	0, 1	0, 1
BACTIV					
n (miss)	96 (26)	96 (26)	96 (6)	96 (3)	96 (3)
$Mean \pm Std\text{-}Dev$	7.3 ± 2.9	7.6 ± 3	7.6 ± 2.9	7.5 ± 3	7.4 ± 2.5
Median (Q1– Q3)	6 (6–8)	6 (6–8.75)	6 (6–9)	6 (6–9)	7 (6–9)
Min, Max	0, 19	1, 17	0, 17	0, 19	0, 15
FSIZE					
n (miss)	96 (1)	96 (0)	96 (0)	96 (0)	96 (0)
$Mean \pm Std\text{-}Dev$	17.3 ± 1.4	17.3 ± 1.4	17.3 ± 1.4	17.3 ± 1.5	17.3 ± 1.4
Median (Q1– Q3)	17.2 (16.4–18)	17.2 (16.4– 17.96)	17.2 (16. 5– 18)	17.2 (16.4– 17.97)	17.24 (16.5– 18)
Min, Max	13.8, 21	13.8, 20.9	13.8, 21	13.8, 21.1	13.7, 21
PROFIT					
n (miss)	96 (1)	96 (0)	96 (0)	96 (0)	96 (0)
$Mean \pm Std\text{-}Dev$	0.1 ± 0.1	0.1 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1
Median (Q1– Q3)	0.05 (0-0.09)	0.04 (0.01– 0.08)	0.04 (0-0.08)	0.03 (0-0.07)	0.02 (0– 0.06)
Min, Max	-0.6, 0.6	-0.3, 0.6	-0.2, 0.6	-0.2, 0.9	-0.4, 1
LIQUD					
n (miss)	96 (1)	96 (0)	96 (0)	96 (0)	96 (0)
Mean \pm Std-Dev	9.5 ± 69.7	11.8 ± 91.9	4.7 ± 24.2	3 ± 9.2	6.2 ± 36
Median (Q1– O3)	1.62 (0.96–3)	1.91 (0.97– 3.11)	1.57 (0.88– 2.9)	1.4 (0.88– 2.78)	1.44 (0.82– 2.81)
Min, Max	0.1, 681.2	0, 902.2	0, 238.1	0.1, 89.9	0, 353.4

Table (9)

	2015	2016	2017	2018	2019
CF					
0	17 (81%)	17 (81%)	17 (81%)	16 (76.2%)	19 (90.5%)
1	4 (19%)	4 (19%)	4 (19%)	5 (23.8%)	2 (9.5%)
Total	21 (100%)	21 (100%)	21 (100%)	21 (100%)	21 (100%)
BSIZE					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
Mean \pm Std-Dev	8.8 ± 2.5	8.4 ± 2.4	8.3 ± 2.1	8.3 ± 2	8 ± 2.2
Median (Q1–Q3)	8 (7–10.25)	7 (7–10)	7 (7–10)	7 (7–9)	7 (7–9)
Min, Max	5, 15	5, 15	5, 13	5, 13	4, 13
BINDEP					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
$Mean \pm Std\text{-}Dev$	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
Median (Q1–Q3)	1 (0.86–1)	1 (0.86–1)	1 (0.86–1)	1 (0.86–1)	0.92 (0.86–1)
Min, Max	0.6, 1	0.6, 1	0.6, 1	0.6, 1	0.6, 1
DUALITY					
0	2 (10%)	2 (9.5%)	2 (9.5%)	2 (9.5%)	2 (9.5%)
1	18 (90%)	19 (90.5%)	19 (90.5%)	19 (90.5%)	19 (90.5%)
Total	20 (100%)	21 (100%)	21 (100%)	21 (100%)	21 (100%)
OWNERS					
n (miss)	21 (2)	21 (2)	21 (2)	21 (2)	21 (2)
$Mean \pm Std\text{-}Dev$	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3
Median (Q1–Q3)	0.44 (0.24–0.71)	0.53 (0.2– 0.7)	0.53 (0.25–0.7)	0.53 (0.25– 0.7)	0.53 (0.27– 0.69)
Min, Max	0, 0.9	0, 0.9	0, 0.9	0, 0.9	0, 0.9
OWNERC					
0	13 (65%)	13 (61.9%)	13 (61.9%)	13 (61.9%)	13 (61.9%)
1	7 (35%)	8 (38.1%)	8 (38.1%)	8 (38.1%)	8 (38.1%)
Total	20 (100%)	21 (100%)	21 (100%)	21 (100%)	21 (100%)
AUDITC					
0	8 (40%)	8 (38.1%)	8 (38.1%)	8 (38.1%)	8 (38.1%)
1	12 (60%)	13 (61.9%)	13 (61.9%)	13 (61.9%)	13 (61.9%)
Total	20 (100%)	21 (100%)	21 (100%)	21 (100%)	21 (100%)
BAGE					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
$Mean \pm Std\text{-}Dev$	56.7 ± 8.4	56.6 ± 8.3	56.5 ± 7.6	57.2 ± 7.4	56.6 ± 8.6
Median (Q1–Q3)	53.92 (50.7– 59.9)	53.8 (49.7– 61)	57.3 (50-60.7)	57.1 (51.7– 61.3)	57.92 (48.57–63)
Min, Max	46.9, 74.8	45.6, 73.1	46.6, 74	47, 75.3	44.9, 76.3
BGENDER					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
$Mean \pm Std\text{-}Dev$	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1

Descriptive Statistics for Palestine Exchange from 2015 to 2019

	2015	2016	2017	2018	2019
Median (Q1–Q3)	0 (0-0.02)	0 (0-0.14)	0 (0-0.14)	0 (0-0.11)	0 (0-0.11)
Min, Max	0, 0.4	0, 0.4	0, 0.4	0, 0.4	0, 0.3
BEDU					
n (miss)	21 (2)	21 (2)	21 (2)	21 (2)	21 (2)
Mean \pm Std-Dev	0.5 ± 0.2	0.5 ± 0.2	0.5 ± 0.2	0.5 ± 0.2	0.6 ± 0.2
Median (Q1–Q3)	0.5 (0.37–0.6)	0.5 (0.4–0.6)	0.5 (0.43–0.6)	0.46 (0.4– 0.6)	0.46 (0.43 0.7)
Min, Max	0.1, 0.9	0.1, 0.9	0.1, 0.9	0.1, 0.8	0.3, 1
BACTIV					
n (miss)	21 (1)	21 (1)	21 (1)	21 (1)	21 (0)
Mean \pm Std-Dev	6.2 ± 1.6	6 ± 1.6	5.8 ± 2.1	5.7 ± 2.1	5.8 ± 2.1
Median (Q1–Q3)	6 (6–6)	6 (5.75–6)	6 (6–6)	6 (5–6)	6 (5–6)
Min, Max	3, 12	3, 12	0, 12	0, 12	0, 12
FSIZE					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
Mean \pm Std-Dev	17 ± 1.4	16.9 ± 1.5	17 ± 1.5	17 ± 1.5	17 ± 1.5
Median (Q1–Q3)	17 (16.24– 17.54)	16.8 (16–18)	16.9(16.3–17.7)	16.97(16 – 18)	17.04 (16.5– 17.8)
Min, Max	14.2, 20.4	14, 20.7	13.9, 20.7	13.8, 20.6	13.7, 20.6
PROFIT					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
Mean ± Std-Dev	0 ± 0.2	0 ± 0.1	0.1 ± 0.1	0 ± 0.1	0 ± 0.1
Median (Q1–Q3)	0.04 (-0.01- 0.12)	0.03 (0– 0.08)	0.03 (0.02–0.1)	0.02 (0– 0.08)	0.03 (0- 0.08)
Min, Max	-0.6, 0.3	-0.2, 0.2	-0.1, 0.2	-0.1, 0.1	-0.1, 0.1
LIQUD					
n (miss)	21 (1)	21 (0)	21 (0)	21 (0)	21 (0)
Mean \pm Std-Dev	2.6 ± 1.9	2.6 ± 2	2.7 ± 2.7	2.6 ± 2.3	2.6 ± 2.4
Median (Q1–Q3)	1.92 (1.25–4.16)	2.03 (1.08– 3.8)	1.86 (0.81–3.4)	1.79 (0.89– 3.7)	1.88 (1.1- 3.28)
Min, Max	0.4, 6.6	0.3, 8.6	0.1, 11.6	0.1, 9.5	0.1, 9.9

Table (10)

Descriptive Statistics for Amman Stock Exchange from 2015 to 2019	

	2015	2016	2017	2018	2019
CF					
0	59 (78.7%)	57 (76%)	58 (77.3%)	50 (66.7%)	67 (89.3%)
1	16 (21.3%)	18 (24%)	17 (22.7%)	25 (33.3%)	8 (10.7%)
Total	75 (100%)	75 (100%)	75 (100%)	75 (100%)	75 (100%)
BSIZE	~ /	· · · ·	× ,	~ /	
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (0)
Mean ± Std-Dev	8.3 ± 2.6	8.2 ± 2.6	8.4 ± 2.8	8.7 ± 2.6	8.4 ± 2.6
Median (Q1–Q3)	8 (7–10)	8 (6.5–10)	8 (6–10.5)	9 (7–11)	9 (6.5–10)
Min, Max	4, 14	5, 14	5, 15	5, 15	4, 13
BINDEP					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (0)
Mean \pm Std-Dev	0.9 ± 0.1	0.9 ± 0.2	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.2
Median (Q1–Q3)	1 (0.86–1)	0.92 (0.86–1)	1 (0.85–1)	0.93 (0.86– 1)	1 (0.86–1)
Min, Max	0.4, 1	0.1, 1	0.1, 1	0.1, 1	0, 1
DUALITY					
0	6 (8%)	8 (10.7%)	2 (2.7%)	2 (2.7%)	4 (5.3%)
1	69 (92%)	67 (89.3%)	73 (97.3%)	73 (97.3%)	71 (94.7%)
Total	75 (100%)	75 (100%)	75 (100%)	75 (100%)	75 (100%)
OWNERS					
n (miss)	75 (3)	75 (3)	75 (3)	75 (3)	75 (3)
$Mean \pm Std\text{-}Dev$	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.5 ± 0.3	0.4 ± 0.3
Median (Q1-Q3)	0.45 (0.22– 0.71)	0.42 (0.24– 0.71)	0.47 (0.26– 0.7)	0.5 (0.29– 0.73)	0.46 (0.22– 0.68)
Min, Max	0, 1	0, 1	0, 1	0, 1	0, 1
OWNERC					
0	54 (73%)	54 (73%)	54 (72%)	52 (69.3%)	52 (70.3%)
1	20 (27%)	20 (27%)	21 (28%)	23 (30.7%)	22 (29.7%)
Total	74 (100%)	74 (100%)	75 (100%)	75 (100%)	74 (100%)
AUDITC					
0	12 (16.7%)	9 (12.5%)	2 (2.7%)	2 (2.7%)	1 (1.3%)
1	60 (83.3%)	63 (87.5%)	73 (97.3%)	73 (97.3%)	74 (98.7%)
Total	72 (100%)	72 (100%)	75 (100%)	75 (100%)	75 (100%)
BAGE					
n (miss)	75 (3)	75 (3)	75 (3)	75 (3)	75 (3)
$Mean \pm Std\text{-}Dev$	55.6 ± 7.2	55.7 ± 7.4	57.3 ± 7.1	56.2 ± 7.7	57.1 ± 7.1
Median (Q1–Q3)	56.32 (50.4– 60.6)	55.21 (50.1– 60.63)	57.4 (53.4– 61.9)	55.41 (50– 61)	56.8 (52.4– 62.2)
Min, Max	39.4, 73.2	40.4, 74.2	41.4, 76.7	39.7, 78.4	40.2, 76.1
BGENDER					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (1)
$Mean \pm Std-Dev$	0 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1

	2015	2016	2017	2018	2019
Median (Q1–Q3)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0-0)	0 (0–0)
Min, Max	0, 0.2	0, 0.3	0, 0.3	0, 0.3	0, 0.3
BEDU					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (1)
Mean \pm Std-Dev	0.3 ± 0.2	0.3 ± 0.2	0.3 ± 0.2	0.3 ± 0.2	0.3 ± 0.2
Median (Q1–Q3)	0.33 (0.2– 0.44)	0.33 (0.2– 0.43)	0.33 (0.2– 0.44)	0.33 (0.2– 0.44)	0.35 (0.21– 0.44)
Min, Max	0, 0.9	0, 0.8	0, 1	0, 1	0, 1
BACTIV					
n (miss)	75 (25)	75 (25)	75 (5)	75 (2)	75 (3)
Mean \pm Std-Dev	7.8 ± 3.2	8.3 ± 3.2	8.1 ± 3	8 ± 3.1	7.9 ± 2.4
Median (Q1–Q3)	7 (6–9)	7 (6–10)	7 (6–9)	7 (6–9)	7 (6–9)
Min, Max	0, 19	1, 17	1, 17	1, 19	1, 15
FSIZE					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (0)
Mean \pm Std-Dev	17.3 ± 1.4	17.4 ± 1.4	17.4 ± 1.4	17.4 ± 1.5	17.3 ± 1.4
Median (Q1–Q3)	17.32 (16.5– 17.9)	17.3 (16.46– 18.02)	17.34(16.5– 18	17.24 (16.5–18.)	17.27 (16.4- 18)
Min, Max	13.8, 21	13.8, 20.9	13.8, 21	13.8, 21.1	13.7, 21
PROFIT					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (0)
Mean \pm Std-Dev	0.1 ± 0.1	0.1 ± 0.1	0 ± 0.1	0 ± 0.1	0 ± 0.1
Median (Q1–Q3)	0.05 (0.01– 0.09)	0.05 (0.01– 0.08)	0.04 (0– 0.08)	0.03 (- 0.01–0.07)	0.01 (0-0.06
Min, Max	-0.2, 0.6	-0.3, 0.6	-0.2, 0.6	-0.2, 0.9	-0.4, 1
LIQUD					
n (miss)	75 (0)	75 (0)	75 (0)	75 (0)	75 (0)
Mean \pm Std-Dev	11.3 ± 78.4	14.3 ± 103.9	5.3 ± 27.3	3.1 ± 10.3	7.2 ± 40.7
Median (Q1–Q3)	1.54 (0.88– 2.7)	1.89 (0.95– 2.83)	1.55 (0.9– 2.85)	1.34 (0.87– 2.46)	1.42 (0.81– 2.53)
Min, Max	0.1, 681.2	0,902.2	0,238.1	0.1, 89.9	0,353.4

Table (14)

	Models	R ²	P value	
Overall	Model 1: CG	0.048	0.001	
	Model 2: BC	0.0591	1.00E-04	
PEX	Model 1: CG	0.147	0.02	
	Model 2: BC	0.1493	0.005	
ASE	Model 1: CG	0.079	1E-04	
	Model 2: BC	0.08453	2E-05	
Difference	CG and BC	0.082	4E-04	

Log-Likelihood Test

Table (15)

Summary of the Overall Results

Variables Sig		ficant	Insign	ificant
	Positive	Negative	Positive	Negative
CG	~	/		
Board Size		✓		
Board independence		✓		
CEO duality			✓	
Ownership structure			✓	
Ownership concentration			~	
Audit committee			✓	
BC	•	/		
Board Age		~		
Board gender				✓
Board education		~		
Board activity			✓	
Firm size		✓		
Liquidity		✓		
Profitability		✓		

Table (16)

Variables	Significant		Insignificant	
	Positive	Negative	Positive	Negative
CG		✓		
Board size			✓	
Board independence			✓	
CEO duality			✓	
Ownership structure			✓	
Ownership concentration	✓			
Audit committee			✓	
BC		✓		
Board age		✓		
Board gender			✓	
Board education	~			
Board activity	✓			
Firm size			✓	
Liquidity				✓
Profitability				~

Summary of the Results for Palestine Exchange

Table (17)

Summary of the Results for the Amman Stock Exchange

Variables	Signi	ificant	Insignificant		
	Positive	Negative	Positive	Negative	
CG	•	/			
Board size		✓			
Board independence		✓			
CEO duality				✓	
Ownership structure			✓		
Ownership concentration			✓		
Audit committee			✓		
BC	•	/			
Board age		✓			
Board gender				✓	
Board education	✓				
Board activity			✓		
Firm size		✓			
Liquidity		~			
Profitability	✓				

Table (18)

Test Hypotheses

	Hypotheses	All	PEX	ASE
HA	There is a significant impact of CG mechanisms on CF.	Accept	Accept	Accept
HA1	There is a significant impact of board size on CF.	Accept	Reject	Accept
HA2	There is a significant impact of board independence on CF.	Accept	Reject	Accept
HA3	There is a significant impact of CEO duality on CF.	Reject	Reject	Reject
HA4	There is a significant impact of ownership structure on CF.	Reject	Reject	Reject
HA5	There is a significant impact of ownership concentration on CF.	Reject	Accept	Reject
HA6	There is a significant impact of audit committee existence on CF.	Reject	Reject	Reject
HB	There is a significant impact of BC on CF.	Accept	Accept	Accept
HB1	There is a significant impact of board age on CF.	Accept	Accept	Accept
HB2	There is a significant impact of board gender on CF.	Reject	Reject	Reject
HB3	There is a significant impact of board education on CF.	Accept	Accept	Accept
HB4	There is a significant impact of board activity on CF.	Reject	Accept	Reject
HC	There are significant differences between the PEX and the ASE regarding the impact of CG and BC on CF.		Accept	

Table (19)

Sample 2015-2019

#	Market	Sector	Company	Symbols
1	PEX	Industrial	Arab Company For Paints Products	APC
2	PEX	Industrial	Jerusalem Pharmaceuticals	JPH
3	PEX	Industrial	The National Carton Industry	NCI
4	PEX	Industrial	Birzeit Pharmaceuticals	BPC
5	PEX	Industrial	Golden Wheat Mills	GMC
6	PEX	Industrial	National Aluminum And Profiles	NAPCO
7	PEX	Industrial	Palestine Poultry	AZIZA
8	PEX	Industrial	Al Shark Electrode	ELECTRODE
9	PEX	Industrial	Jerusalem Cigarette	JCC
10	PEX	Industrial	Palestine Plastics Industries	LADAEN
11	PEX	Industrial	The Vegetable Oil Industries	VOIC
12	PEX	Industrial	Beit Jala Pharmaceutical	BJP
13	PEX	Service	Nablus Surgical Center	NSC
14	PEX	Service	Al Wataniah Towers	ABRAJ
15	PEX	Service	Ramallah Summer Resorts	RSR
16	PEX	Service	Wataniya Palestine Mobile Telecommunications	OOREDOO
17	PEX	Service	Palestine Electric	PEC
18	PEX	Service	Palestine Telecommunications	PALTEL
19	PEX	Service	Palestinian Company For Distribution & Logistics	WASSEL
20	PEX	Service	The Arab Hotels	AHC
21	PEX	Service	Palaqar For Real Estate Development & Management	PALAQAR
22	ASE	Industrial	Dar Al Dawa Development & Investment	DADI
23	ASE	Industrial	Hayat Pharmaceutical Industries Co.	HPIC
24	ASE	Industrial	Philadelphia Pharmaceuticals	PHIL
25	ASE	Industrial	The Industrial Commercial & Agricultural	ICAG
26	ASE	Industrial	Premier Business And Projects Co.Ltd	ACDT
27	ASE	Industrial	National Chlorine Industries	NATC
28	ASE	Industrial	Jordan Industrial Resources	JOIR
29	ASE	Industrial	The Arab Pesticides & Veterinary Drugs Mfg.	MBED
30	ASE	Industrial	Jordan Poultry Processing & Marketing	JPPC
31	ASE	Industrial	Jordan Dairy	JODA
32	ASE	Industrial	General Investment	GENI
33	ASE	Industrial	Universal Modern Industries	UMIC

#	Market	Sector	Company	Symbols
34	ASE	Industrial	National Poultry	NATP
35	ASE	Industrial	NUTRI DAR	NDAR
36	ASE	Industrial	Jordan Vegetable Oil Industries	JVOI
37	ASE	Industrial	Siniora Food Industries Plc	SNRA
38	ASE	Industrial	Union Tobacco & Cigarette Industries	UTOB
39	ASE	Industrial	Arab Aluminium Industry /Aral	AALU
40	ASE	Industrial	National Steel Industry	NAST
41	ASE	Industrial	Jordan Phosphate Mines	JOPH
42	ASE	Industrial	The Arab Potash	APOT
43	ASE	Industrial	Jordan Steel	JOST
44	ASE	Industrial	National Aluminium Industrial	NATA
45	ASE	Industrial	Northern Cement Co.	NCCO
46	ASE	Industrial	The Jordan Pipes Manufacturing	JOPI
47	ASE	Industrial	Jordan Wood Industries / Jwico	WOOD
48	ASE	Industrial	Ready Mix Concrte And Construction Supplies	RMCC
49	ASE	Industrial	Arabian Steel Pipes Manufacturing	ASPMM
50	ASE	Industrial	Al-Quds Ready Mix	AQRM
51	ASE	Industrial	Assas For Concrete Products Co. Ltd	ASAS
52	ASE	Industrial	National Cable & Wire Manufacturing	WIRE
53	ASE	Industrial	Arab Electrical Industries	AEIN
54	ASE	Industrial	United Cable Industries	UCIC
55	ASE	Industrial	The Jordan Worsted Mills	JOWM
56	ASE	Service	Al-Bilad Medical Services	ABMS
57	ASE	Service	The Consultant & Investment Group	CICO
58	ASE	Service	Ibn Alhaytham Hospital Company	IBNH
59	ASE	Service	International For Medical Investment	ICMI
60	ASE	Service	Al-Zarqa Educational & Investment	ZEIC
61	ASE	Service	The Arab InternationL For Education & Investment.	AIEI
62	ASE	Service	Al-Isra For Education And Investment "Plc"	AIFE
63	ASE	Service	Petra Education Company	PEDC
64	ASE	Service	Philadelphia International Educational Investment	PIEC
65	ASE	Service	Jordan Hotels & Tourism	JOHT
66	ASE	Service	Arab International Hotels	AIHO
67	ASE	Service	Mediterranean Tourism Investment	MDTR
68	ASE	Service	Zara Investement Holding	ZARA
69	ASE	Service	Al- Sharq Investments Projects(Holding)	AIPC

	Market	Sector	Company	Symbols
70	ASE	Service	Al-Dawliyah For Hotels & Malls	MALL
71	ASE	Service	Al-Rakaez Investment Co.	RICS
72	ASE	Service	Sura Development & Investment Plc	SURA
73	ASE	Service	Jordan National Shipping Lines	SHIP
74	ASE	Service	Salam Internationl Transport & Trading	SITT
75	ASE	Service	Jordan Express Tourist Transport	JETT
76	ASE	Service	Jordan Investment & Transport Co.	ALFA
77	ASE	Service	Transport& Investment Barter Company	NAQL
78	ASE	Service	Masafat For Specialised Transport	MSFT
70	ASE	Sorvico	Rum Group For Transportation & Tourism	DIMM
19	ASE	Service	Investment	KUIVIIVI
80	ASE	Service	Jordan Telecom	JTEL
Q 1	ASE	Service	Al-Faris National Company For Investment &	CEBC
01	ASE	Service	Export	CEBC
82	ASE	Service	Jordan Press Foundation/Al-Ra'I	PRES
83	ASE	Service	Jordan Electric Power	JOEP
84	ASE	Service	Irbid District Electricity	IREL
85	ASE	Service	Afaq For Energy Co. P.L.C	MANE
86	ASE	Service	National Petrouleum	NAPT
87	ASE	Service	Jordan Petroleum Refinery	JOPT
88	ASE	Service	Jordanian Duty Free Shops	JDFS
89	ASE	Service	Jordan International Trading Center	JITC
90	ASE	Service	Jordan Trade Fac	JOTF
91	ASE	Service	Specialized Trading & Investment	SPTI
92	ASE	Service	Bindar Trading & Investment Co . P.L.C	BIND
93	ASE	Service	Offtecholding Group Plc	OFTC
94	ASE	Service	Nopar For Trading And Investment	NOTI
95	ASE	Service	Comprehensive Leasing Company Plc	LEAS
96	ASE	Service	Injaz For Development & Projects	ATCO

Source: www.pex.ps, www.ase.com.

Table (20)

Descriptive	statistics	for th	e PEX	and	ASE	in	2015	

	ASE	PEX	Diff. [95% CI]	P value
CF				
0	59 (78.7%)	16 (80.0%)	1% [-11.6%-13.7%]	
1	16 (21.3%)	4 (20.0%)		
Total	75 (100.0%)	20 (100.0%)		
BSIZE				
n (miss)	75 (0)	21 (1)	0.5[-0.7- 1.8]	0.50***
Mean ± Std-Dev	8.3 ± 2.6	8.8 ± 2.5	0.0[-2.0- 1.0]	
Median (Q1-Q3)	8 (7-10)	8 (7-10.25)		
Min, Max	4, 14	5, 15		
BINDEP			0.0[-0.1- 0.0]	
n (miss)	75 (0)	21 (1)	0.0[0.0-0.0]	0.90***
$Mean \pm Std\text{-}Dev$	0.9 ± 0.1	0.9 ± 0.1		
Median (Q1-Q3)	1 (0.86-1)	1 (0.86-1)		
Min, Max	0.4, 1	0.6, 1		
DUALITY				
0	6 (8.0%)	2 (10.0%)	-68.8% [-79.9%– 57.6%]	1.00*
1	69 (92.0%)	18 (90.0%)		
Total	75 (100.0%)	20 (100.0%)		
OWNERS				
n (miss)	75 (3)	21 (2)	0[-0.1-0.1]	0.96**
Mean ± Std-Dev	0.5 ± 0.3	0.5 ± 0.3		
Median (Q1-Q3)	0.45 (0.22-0.71)	0.44 (0.24-0.71)		
Min, Max	0, 1	0, 0.9		
OWNERC				
0	54 (73.0%)	13 (65.0%)	6.2% [-19.5%-7.0%]	0.67*
1	20 (27.0%)	7 (35.0%)		
Total	74 (100.0%)	20 (100.0%)		
AUDITC				
0	12 (16.7%)	8 (40.0%)	-53.1% [-66.1%- 40.1%]	0.05*
1	60 (83.3%)	12 (60.0%)		
Total	72 (100.0%)	20 (100.0%)		
BAGE				
n (miss)	75 (3)	21 (1)	1.0[-2.8- 5.1]	1.00***

	ASE	PEX	Diff. [95% CI]	P value
$Mean \pm Std\text{-}Dev$	55.6 ± 7.2	56.7 ± 8.4	0.0[-4.3-3.8]	
Median (Q1-Q3)	56.32 (50.36-60.55)	53.92 (50.71-59.93)		
Min, Max	39.4, 73.2	46.9, 74.8		
BGENDER				
n (miss)	75 (0)	21 (1)	0.0[0.0-0.1]	0.40***
$Mean \pm Std\text{-}Dev$	0 ± 0.1	0.1 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	0, 0.2	0, 0.4		
Min, Max				
BEDU				
n (miss)	75 (0)	21 (2)	0.1[0-0.2]	< 0.001**
$Mean \pm Std\text{-}Dev$	0.3 ± 0.2	0.5 ± 0.2		
Median (Q1-Q3)	0.33 (0.2-0.44)	0.5 (0.37-0.6)		
Min, Max	0, 0.9	0.1, 0.9		
BACTIV				
n (miss)	75 (25)	21 (1)	-1.6[-2.7–0.4]	< 0.001***
$Mean \pm Std\text{-}Dev$	7.8 ± 3.2	6.2 ± 1.6	1.0[0.0-2.0]	
Median (Q1-Q3)	7 (6-9)	6 (6-6)		
Min, Max	0, 19	3, 12		
FSIZE				
n (miss)	75 (0)	21 (1)	-0.3[-1-0.3]	0.33**
$Mean \pm Std\text{-}Dev$	17.3 ± 1.4	17 ± 1.4		
Median (Q1-Q3)	17.3 (16.48-17.9)	17 (16.24-17.54)		
Min, Max	13.8, 21	14.2, 20.4		
PROFIT				
n (miss)	75 (0)	21 (1)	0.0[-0.1- 0.0]	0.76***
$Mean \pm Std\text{-}Dev$	0.1 ± 0.1	0 ± 0.2	0.0[0.0-0.0]	
Median (Q1-Q3)	0.05 (0.01-0.09)	0.04 (-0.01-0.12)		
Min, Max	-0.2, 0.6	-0.6, 0.3		
LIQUD				
n (miss)	75 (0)	21 (1)	-8.7[-27.4- 1.1]	0.22***
$Mean \pm Std\text{-}Dev$	11.3 ± 78.4	2.6 ± 1.9	-0.4[-1.1- 0.3]	
Median (Q1-Q3)	1.54 (0.88-2.7)	1.92 (1.25-4.16)		
Min, Max	0.1, 681.2	0.4, 6.6		

Table (21)

Descriptive	Statistics	for the	PEX and	l ASE in 2016

	ASE	PEX	Diff. [95% CI]	P value
CF				
0	57 (76.0%)	17 (81.0%)	-1% [-13.9%- 11.8%]	0.85*
1	18 (24.0%)	4 (19.0%)		
Total	75 (100.0%)	21 (100.0%)		
BSIZE				
n (miss)	75 (0)	21 (0)	0.2[-0.9- 1.4]	0.72***
Mean \pm Std-Dev	8.2 ± 2.6	8.4 ± 2.4	0.0[-2.0- 1.0]	
Median (Q1-Q3)	8 (6.5-10)	7 (7-10)		
Min, Max	5, 14	5, 15		
BINDEP				
n (miss)	75 (0)	21 (0)	0.0[0.0-0.1]	0.63***
Mean \pm Std-Dev	0.9 ± 0.2	0.9 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	0.92 (0.86-1)	1 (0.86-1)		
Min, Max	0.1, 1	0.6, 1		
DUALITY				
0	8 (10.7%)	2 (9.5%)	-67.7% [- 79.0%–56.4%]	1.00*
1	67 (89.3%)	19 (90.5%)		
Total	75 (100.0%)	21 (100.0%)		
OWNERS				
n (miss)	75 (3)	21 (2)	0[-0.1-0.1]	0.90**
Mean \pm Std-Dev	0.5 ± 0.3	0.5 ± 0.3		
Median (Q1-Q3)	0.42 (0.24-0.71)	0.53 (0.24-0.71)		
Min, Max	0, 1	0, 0.9		
OWNERC				
0	54 (73.0%)	13 (61.9%)	-7.3% [-20.6%- 6.0%]	0.48*
1	20 (27.0%)	8 (38.1%)		
Total	74(100%)	21 (100.0%)		
AUDITC	. ,			
0	9 (12.5%)	8 (38.1%)	-57% [-67%– 44.7%1	0.02*
1	63 (87.5%)	13 (61.9%)	1	
Total	72 (100.0%)	21 (100.0%)		
BAGE				
n (miss)	75 (3)	21 (0)	0.9[-2.9-4.6]	0.64**
Mean \pm Std-Dev	55.7 ± 7.4	56.6 ± 8.3		
Median (Q1-Q3)	55.21 (50.1-60.63)	53.8 (49.67- 61.09)		
Min, Max	40.4, 74.2	45.6, 73.1		
BGENDER				
n (miss)	75 (0)	21 (0)	0.0[0.0-0.1]	0.18***
Mean \pm Std-Dev	0 ± 0.1	0.1 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	0 (0-0)	0 (0-0.14)		

		DF157	D. 60 10 201 033	D 1
	ASE	PEX	Diff. [95% CI]	P value
Min, Max	0, 0.3	0, 0.4		
BEDU				
n (miss)	75 (0)	21 (2)	0.2[0.1-0.3]	< 0.001**
$Mean \pm Std\text{-}Dev$	0.3 ± 0.2	0.5 ± 0.2		
Median (Q1-Q3)	0.33 (0.2-0.43)	0.5 (0.43-0.6)		
Min, Max	0, 0.8	0.1, 0.9		
BACTIV				
n (miss)	75 (25)	21 (1)	-2.3[-3.4–1.2]	< 0.001***
$Mean \pm Std\text{-}Dev$	8.3 ± 3.2	6 ± 1.6	1.0[1.0-3.0]	
Median (Q1-Q3)	7 (6-10)	6 (5.75-6)		
Min, Max	1, 17	3, 12		
FSIZE				
n (miss)	75 (0)	21 (0)	-0.5[-1.2-0.2]	0.18**
$Mean \pm Std\text{-}Dev$	17.4 ± 1.4	16.9 ± 1.5		
Median (Q1-Q3)	17.3 (16.46-18.02)	16.84 (16.16- 17.51)		
Min, Max	13.8, 20.9	14, 20.7		
PROFIT				
n (miss)	75 (0)	21 (0)	0[-0.1-0]	0.58**
$Mean \pm Std\text{-}Dev$	0.1 ± 0.1	0 ± 0.1		
Median (Q1-Q3)	0.05 (0.01-0.08)	0.03 (0-0.08)		
Min, Max	-0.3, 0.6	-0.2, 0.2		
LIQUD				
n (miss)	75 (0)	21 (0)	-11.5[-36.3- 1.1]	0.35***
$Mean \pm Std\text{-}Dev$	14.3 ± 103.9	2.6 ± 2	-0.3[-1.1- 0.4]	
Median (Q1-Q3)	1.89 (0.95-2.83)	2.03 (1.08-3.81)		
Min, Max	0,902.2	0.3, 8.6		

Table (22)

Descriptive	Statistics.	for th	e PEX	and	ASE	in 2	2017

	ASE	PEX	Diff. [95% CI]	P value
CF				
0	58 (77.3%)	17 (81.0%)	0% [-11.7%-11.7%]	0.96*
1	17 (22.7%)	4 (19.0%)		
Total	75 (100.0%)	21 (100.0%)		
BSIZE				
n (miss)	75 (0)	21 (0)	-0.1[-1.2- 1.0]	0.94***
Mean \pm Std-Dev	8.4 ± 2.8	8.3 ± 2.1	0.0[-1.0- 1.0]	
Median (Q1-Q3)	8 (6-10.5)	7 (7-10)		
Min, Max	5, 15	5, 13		
BINDEP				
n (miss)	75 (0)	21 (0)	0.0[-0.1- 0.1]	0.98***
$Mean \pm Std\text{-}Dev$	0.9 ± 0.1	0.9 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	1 (0.85-1)	1 (0.86-1)		
Min, Max	0.1, 1	0.6, 1		
DUALITY				
0	2 (2.7%)	2 (9.5%)	-74% [-84.2%– 63.7%]	0.44*
1	73 (97.3%)	19 (90.5%)		
Total	75 (100.0%)	21 (100.0%)		
OWNERS				
n (miss)	75 (3)	21 (2)	0[-0.1-0.1]	0.97**
$Mean \pm Std\text{-}Dev$	0.5 ± 0.3	0.5 ± 0.3		
Median (Q1-Q3)	0.47 (0.26-0.71)	0.53 (0.25- 0.71)		
Min, Max	0, 1	0, 0.9		
OWNERC				
0	54 (72.0%)	13 (61.9%)	8.3% [-21.7%-5.1%]	0.53*
1	21 (28.0%)	8 (38.1%)		
Total	75 (100.0%)	21 (100.0%)		
AUDITC				
0	2 (2.7%)	8 (38.1%)	-67.7% [-79.0%– 56.4%]	< 0.001*
1	73 (97.3%)	13 (61.9%)		
Total	75 (100.0%)	21 (100.0%)		
BAGE				
n (miss)	75 (3)	21 (0)	-0.8[-4.4-2.7]	0.65**
$Mean \pm Std\text{-}Dev$	57.3 ± 7.1	56.5 ± 7.6		
Median (Q1-Q3)	57.38 (53.38- 61.86)	57.29 (50- 60.67)		
Min, Max	41.4, 76.7	46.6, 74		

	ASE	PEX	Diff. [95% CI]	P value
BGENDER				
n (miss)	75 (0)	21 (0)	0.0[0.0-0.1]	0.20***
Mean \pm Std-Dev	0 ± 0.1	0.1 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	0 (0-0)	0 (0-0.14)		
Min, Max	0, 0.3	0, 0.4		
BEDU				
n (miss)	75 (0)	21 (2)	0.2[0.1-0.3]	< 0.001**
Mean \pm Std-Dev	0.3 ± 0.2	0.5 ± 0.2		
Median (Q1-Q3)	0.33 (0.2-0.44)	0.5 (0.43-0.6)		
Min, Max	0, 1	0.1, 0.9		
BACTIV				
n (miss)	75 (5)	21 (1)	-2.3[-3.4–1.2]	< 0.001***
Mean \pm Std-Dev	8.1 ± 3	5.8 ± 2.1	1.0[0.0-3.0]	
Median (Q1-Q3)	7 (6-9)	6 (6-6)		
Min, Max	1, 17	0, 12		
FSIZE				
n (miss)	75 (0)	21 (0)	-0.4[-1.1-0.3]	0.26**
Mean \pm Std-Dev	17.4 ± 1.4	17 ± 1.5		
Median (Q1-Q3)	17.34 (16.54- 18.02)	16.92 (16.31- 17.65)		
Min, Max	13.8, 21	13.9, 20.7		
PROFIT				
n (miss)	75 (0)	21 (0)	0[0-0.1]	0.70**
Mean \pm Std-Dev	0 ± 0.1	0.1 ± 0.1		
Median (Q1-Q3)	0.04 (0-0.08)	0.03 (0.02-0.1)		
Min, Max	-0.2, 0.6	-0.1, 0.2		
LIQUD				
n (miss)	75 (0)	21 (0)	-2.7[-9.7- 1.5]	0.56***
Mean \pm Std-Dev	5.3 ± 27.3	2.7 ± 2.7	-0.2[-1.0- 0.4]	
Median (Q1-Q3)	1.55 (0.91-2.85)	1.86 (0.81- 3.35)		
Min, Max	0, 238.1	0.1, 11.6		

Table (23)

	ASE	PEX	Diff. [95% CI]	P value
CF				
0	50 (66.7%)	16 (76.2%)	-9.4% [-22.8%-4.1%]	0.57*
1	25 (33.3%)	5 (23.8%)		
Total	75 (100.0%)	21 (100.0%)		
BSIZE				
n (miss)	75 (0)	21 (0)	-0.4[-1.4- 0.6]	0.55***
$Mean \pm Std\text{-}Dev$	8.7 ± 2.6	8.3 ± 2	0.0[-1.0- 2.0]	
Median (Q1-Q3)	9 (7-11)	7 (7-9)		
Min, Max	5, 15	5, 13		
BINDEP				
n (miss)	75 (0)	21 (0)	0.0[-0.1- 0.1]	0.54***
$Mean \pm Std\text{-}Dev$	0.9 ± 0.1	0.9 ± 0.1	0.0[-0.1- 0.0]	
Median (Q1-Q3)	0.93 (0.86-1)	1 (0.86-1)		
Min, Max	0.1, 1	0.6, 1		
DUALITY				
0	2 (2.7%)	2 (9.5%)	-74% [-84.2%-63.7%]	0.44*
1	73 (97.3%)	19 (90.5%)		
Total	75 (100.0%)	21 (100.0%)		
OWNERS				
n (miss)	75 (3)	21 (2)	0[-0.2-0.1]	0.74**
$Mean \pm Std\text{-}Dev$	0.5 ± 0.3	0.5 ± 0.3		
Median (Q1-Q3)	0.5 (0.29-0.73)	0.53 (0.25-0.7)		
Min, Max	0, 1	0, 0.9		
OWNERC				
0	52 (69.3%)	13 (61.9%)	-10.4% [-23.9%-3.1%]	0.70*
1	23 (30.7%)	8 (38.1%)		
Total	75 (100.0%)	21 (100.0%)		
AUDITC				
0	2 (2.7%)	8 (38.1%)	-67.7% [-79%–56.4%]	<0.001*
1	73 (97.3%)	13 (61.9%)		
Total	75 (100.0%)	21 (100.0%)		
BAGE	. ,	. ,		
n (miss)	75 (3)	21 (0)	1[-2.8-4.7]	0.61**
Mean \pm Std-Dev	56.2 ± 7.7	57.2 ± 7.4	-	
Median (Q1-Q3)	55.41 (50.37- 61.08)	57.11 (51.67- 61.27)		
Min, Max	39.7, 78.4	47, 75.3		
BGENDER				
n (miss)	75 (0)	21 (0)	0.0[0.0-0.1]	0.14***

Descriptive Statistics for the PEX and ASE in 2018

	ASE	PEX	Diff. [95% CI]	P value
Mean ± Std-Dev	0 ± 0.1	0.1 ± 0.1	0.0[0.0-0.0]	
Median (Q1-Q3)	0 (0-0)	0 (0-0.11)		
Min, Max	0, 0.3	0, 0.4		
BEDU				
n (miss)	75 (0)	21 (2)	0.2[0.1-0.3]	<0.001**
Mean \pm Std-Dev	0.3 ± 0.2	0.5 ± 0.2		
Median (Q1-Q3)	0.33 (0.2-0.44)	0.46 (0.43-0.58)		
Min, Max	0, 1	0.1, 0.8		
BACTIV				
n (miss)	75 (2)	21 (1)	-2.4[-3.5–1.3]	<0.001***
Mean \pm Std-Dev	8 ± 3.1	5.7 ± 2.1	2.0[1.0-3.0]	
Median (Q1-Q3)	7 (6-9)	6 (5-6)		
Min, Max	1, 19	0, 12		
FSIZE				
n (miss)	75 (0)	21 (0)	-0.4[-1.1-0.3]	0.25**
Mean \pm Std-Dev	17.4 ± 1.5	17 ± 1.5		
Median (Q1-Q3)	17.24 (16.5- 18.02)	16.97 (16.36- 17.72)		
Min, Max	13.8, 21.1	13.8, 20.6		
PROFIT				
n (miss)	75 (0)	21 (0)	0[-0.1-0]	0.74**
Mean ± Std-Dev	0 ± 0.1	0 ± 0.1		
Median (Q1-Q3)	0.03 (-0.01- 0.07)	0.02 (0-0.08)		
Min, Max	-0.2, 0.9	-0.1, 0.1		
LIQUD				
n (miss)	75 (0)	21 (0)	-0.5[-3.4- 1.5]	0.22***
Mean \pm Std-Dev	3.1 ± 10.3	2.6 ± 2.3	-0.4[-1.3- 0.2]	
Median (Q1-Q3)	1.34 (0.87-2.46)	1.79 (0.89-3.67)		
Min, Max	0.1, 89.9	0.1, 9.5		

Table (24)

	ASE	PEX	Diff. [95% CI]	P Value
CF	-			
0	67 (89.3%)	19 (90.5%)	11.5% [0.1%-22.8%]	1.00*
1	8 (10.7%)	2 (9.5%)		
Total	75 (100.0%)	21 (100.0%)		
BSIZE				
n (miss)	75 (0)	21 (0)	-0.3[-1.4- 0.8]	0.64***
$Mean \pm Std\text{-}Dev$	8.4 ± 2.6	8 ± 2.2	0.0[-1.0- 2.0]	
Median (Q1-Q3)	9 (6.5-10)	7 (7-9)		
Min, Max	4, 13	4, 13		
BINDEP				
n (miss)	75 (0)	21 (0)	0.0[-0.1- 0.1]	0.60***
$Mean \pm Std\text{-}Dev$	0.9 ± 0.2	0.9 ± 0.1	0.0[0.0-0.1]	
Median (Q1-Q3)	1 (0.86-1)	0.92 (0.86-1)		
Min, Max	0, 1	0.6, 1		
DUALITY				
0	4 (5.3%)	2 (9.5%)	-71.9% [-82.5%-61%]	0.85*
1	71 (94.7%)	19 (90.5%)		
Total	75 (100.0%)	21 (100.0%)		
OWNERS				
n (miss)	75 (3)	21 (2)	0[-0.1-0.2]	0.69**
$Mean \pm Std\text{-}Dev$	0.4 ± 0.3	0.5 ± 0.3		
Median (Q1-Q3)	0.46 (0.22-0.68)	0.53 (0.27-0.69)		
Min, Max	0, 1	0, 0.9		
OWNERC				
0	52 (70.3%)	13 (61.9%)	-9.4% [-22.8%-4.1%]	0.64*
1	22 (29.7%)	8 (38.1%)		
Total	74 (100.0%)	21 (100.0%)		
AUDITC				
0	1 (1.3%)	8 (38.1%)	-68.8% [-79.9%-58%]	< 0.001*
1	74 (98.7%)	13 (61.9%)		
Total	75 (100.0%)	21 (100.0%)		
BAGE				
n (miss)	75 (3)	21 (0)	-0.5[-4.2-3.1]	0.78**
$Mean \pm Std\text{-}Dev$	57.1 ± 7.1	56.6 ± 8.6		
Median (Q1-Q3)	56.8 (52.4- 62.23)	57.92 (48.57- 63)		
Min, Max	40.2, 76.1	44.9, 76.3		
BGENDER				
n (miss)	75 (1)	21 (0)	0.0[0.0-0.1]	0.22***
$Mean \pm Std\text{-}Dev$	0 ± 0.1	0.1 ± 0.1	0.0[0.0-0.0]	

Descriptive Statistics for the PEX and ASE in 2019

	ASE	PEX	Diff. [95% CI]	P Value
Median (Q1-Q3)	0 (0-0)	0 (0-0.11)		
Min, Max	0, 0.3	0, 0.3		
BEDU				
n (miss)	75 (1)	21 (2)	0.2[0.1-0.3]	< 0.001***
$Mean \pm Std\text{-}Dev$	0.3 ± 0.2	0.6 ± 0.2	-0.2[-0.3-0.1]	
Median (Q1-Q3)	0.35 (0.21-0.44)	0.46 (0.43-0.67)		
Min, Max	0, 1	0.3, 1		
BACTIV				
n (miss)	75 (3)	21 (0)	-2.1[-3.1–1.0]	< 0.001***
$Mean \pm Std\text{-}Dev$	7.9 ± 2.4	5.8 ± 2.1	2.0[1.0-3.0]	
Median (Q1-Q3)	7 (6-9)	6 (5-6)		
Min, Max	1, 15	0, 12		
FSIZE				
n (miss)	75 (0)	21 (0)	-0.3[-1-0.4]	0.38**
$Mean \pm Std\text{-}Dev$	17.3 ± 1.4	17 ± 1.5		
Median (Q1-Q3)	17.27 (16.44- 18)	17.04 (16.5- 17.75)		
Min, Max	13.7, 21	13.7, 20.6		
PROFIT				
n (miss)	75 (0)	21 (0)	0[0-0.1]	0.61**
$Mean \pm Std\text{-}Dev$	0 ± 0.1	0 ± 0.1		
Median (Q1-Q3)	0.01 (0-0.06)	0.03 (0-0.08)		
Min, Max	-0.4, 1	-0.1, 0.1		
LIQUD				
n (miss)	75 (0)	21 (0)	-4.6[-14.7- 1.1]	0.36***
$Mean \pm Std\text{-}Dev$	7.2 ± 40.7	2.6 ± 2.4	-0.3[-1.0- 0.4]	
Median (Q1-Q3)	1.42 (0.81-2.53)	1.88 (1.1-3.28)		
Min, Max	0, 353.4	0.1, 9.9		

Table (25)

Variables	ER	HR	(95% CI)	P Value
CG				
BSIZE	<1	0.87	(0.80,0.95)	< 0.001
BINDEP	<1	0.15	(0.04,0.55)	< 0.001
DUALITY	<1	0.98	(0.45,2.16)	0.97
OWNERS	>1	1.06	(0.49,2.28)	0.88
OWNERC	>1	1.29	(0.84,1.98)	0.25
AUDIC	>1	1.4	(0.79,2.46)	0.25
BC				
BAGE	<1	0.93	(0.90,0.96)	< 0.001
BGENDER	<1	0.08	(0.00,2.99)	0.17
BEDU	<1	0.2	(0.07,0.61)	< 0.001
BACTIV	>1	1	(0.92,1.08)	0.93
Control-V				
FSIZE	<1	0.74	(0.64,0.86)	< 0.001
LIQUD	<1	0.03	(0.01,0.13)	< 0.001
PROFIT	>1	1	(1.00,1.01)	< 0.001

Cox Hazard Model Adjusted for comparing PEX and ASE



تَأْثير حَوكمة الشَركات وَخَصائص مَجلس الإدارَة على فَشَل الشَركات: التَنبُؤ احصائياً للبَقاء باستخدام لُغة "R"

إعداد ضُحى جَمال يوسِف رَبايعة

إِشراف أ. د. عَبد الناصِر نور د. معز أبو عليا

قدمت هذِه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير في المحاسبة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

تَأَثير حَوكمة الشَركات: التَنبُؤ احصائياً للبَقاء باستخدام لُغة "R" إعداد ضُحى جَمال بوسِف رَبايعة إشراف أ. د. عَبد الناصِر نور د. معز أبو عليا

يَهدِف هذا البَحث إلى التَنبُو بالفَشل المالي للشَركات المُساهِمة العامَة المُدرَجة في بورصَة فلسطين وبُورصة عمّان إحصائِياً باستخدام لُغَة البَرمجة "R"، وأيضاً إلى دِراسَة تأثير حوكَمَة الشِّركات وخصائِص مَجلِس الإدارة عَلى الفشَل المالي للشركات مِن عام 2015 إلى 2019. تمَّ اعتماد منهجيَّة البَقاء من خِلَال تَطبيق نموذج كوكس للأَخْطار النِّسبية باستِخدام بَرنامج Kstudio التَحليل مُدخلات الدِّراسَة البالِغ عَدَدُها 7,200 مشاهدة. تضم عينية الدِراسة 96 شركة مُدرَجة في قِطاعيّ الصِّناعة والخدَمات منها 21 شَركة في فلسطين و75 شَركة في الأُردن. من جِهَة أُخرَى اعتُمد على نظريَّة الوكالة ونظريَّة المراتِب العليا إضافة إلى بعض النَّظريات الأُخرى في تَقسير العَلاقاتِ بينَ المُتغيرَات.

وجدت الدِّراسة أنَّ هنَاك تأثِير مهمّ لحوكمة الشَّرِكات وخصائِص مَجلس الإدارَة على الفَسْل المَالي في فلسطين وَالأُرُدن، حيثُ وجدت ارتباطاً سَلبياً مهماً بينَ حجم المَجلس واستقلاليَّة المَجلس وعُمر المَجلس وتعليم المَجلس وحجم الشَّركة والسُيولة والرِّبحية مع احتماليَّة تعرُض الشَّركة للفشل المالي (للكُل كمجموعة واحدة). وبالتَّفصيل أكثر أشارَت النَّتائِج في فلسطين إلى وجُود علَاقَة إيجابيَّة مُهمَّة لتَرَكُّز المُلكيَّة وتعليم المَجلس واجتماعات المَجلس مع الفَسْل المالي، ولكنْ هُناك ارتباط سَلبِي مهمّ بينَ عمر المَجلس والفَسْل المالي. على عكس ذلكَ في الأُردن، حيثُ وُجدَ ارتباط إيجابي مُهمّ بينَ الرِّبحية والفَسْل المالي، لكن هناك ارتباط سَلبِي مهمّ بينَ عمر المجلس مع الفَسْل المالي، ولكنْ هُناك ارتباط سَلبِي مهم بينَ عمر المَجلس والفَسْل المالي. على عكس ذلكَ الرغم ذلك وُجِدت فُروقات مُهمة بين فلسطين والأُردُن فيما يتعلق بتأثير المتغيرات على الفَشل المالي. عَلاوة على ذلك، تشير نتائِج اختبار الذَكاء الاصطناعي إلى أنَّ السُيولة وحجم الشركة وهيكل الملكية وعُمر المَجلس واستقلالية المَجلس ثم الربحية هي أَهم المقاييس التي تُساهم في التَنبؤ بالفشل المالي (رُتبت حَسب أَهميتها على التَوالي). أخيراً يوضح منحنى خَصائص تَشغيل المستقبل (ROC) أنَّ نَماذج البقاء المقُترحة تُعتبر نماذج مثالية جداً ولها دِقة قِياس تساوي 84%.

تتمتَّل مساهَمة هذه الدِّراسة في الأدبيات المُتَعلَقة بالمُحاسبة مِن خلَال توفِير فَهم للعلَاقة بين حوكمة الشَّركات وخَصَائص مَجلس الإدارة منْ ناحية والفَشل المالي منْ ناحية أُخرى. كما تَتميز بأنها تنبأ إحصائِياً بالفَشل المالي، دونَ الاعتماد على النماذج الكمية الشائِعة مثل نماذج ألتمان وكيدا وشرويد. ومن ناحية أُخرى رَبطت الدراسة بينَ نَظريات علم السُلوك ونَظريات عِلم الادارة وَالأعمال. وتميزَت بتطبيقها لتقنية من تقنيات الذكاء الاصطناعي الرائِد في الأبحاث الحديثة في العصر الحالي. بالإصافة إلى أنها تُعتبر من أوائِل الأَبحاث التي استخدَمت RStudio في مجال المُحاسبة بالتالي فهي تُمثل دليل يَدعم استِخدام هذا البريامج في التَحليلات التشريعية وهيئة سُوق رَأس المَال في العَمل على تَطوير مدوَّنة حوكمة الشَّركات والقوانين بِما يُناسب نتائِج وتَوَصِيات هذه الدَراسة.

على الرغِم من ذلك واجهت الدراسة العديد من المحدِدات أبرزها وُجود فَرق بين حجم سوق فلسطين والأردن للأوراق المالية، وهذا يؤدي إلى اختلافات في دقة النتائج، حيث تؤدي العينة الأكبر إلى نتائج أكثر دقة. بِالإضافة إلى عَدم وُجود مُؤشر متفق عليه لتقييم مدى الأمثال لممارسات حوكَمة الشّركات. قَدمت الدراسة مقترحات لاستكمال وتطوير الدراسة أبرزها هو البحث في تأثير عوامل أخرى على الفشل المالي خاصة تحت تأثير جائحة 19-Covid بالإضافة إلى استخدام تقنيات الذكاء الاصطناعي المختلفة في توقع الفَشل

الكلمات المفتاحية: حوكمة الشركات، خصائص مجلس الإدارة، الفشل المالي، RStudio.