Risk and reward: unraveling the link between credit risk, governance and financial performance in banking industry

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Abstract

Purpose – This study aims to investigate the moderating role of corporate governance (CG) on the relationship between credit risk (CRs) and financial performance (FP) of banks listed in the Palestine Securities' Exchange (PEX) and Amman Securities' Exchange (ASE).

Design/methodology/approach – This study used a hypothesis-testing research design to collect data from the annual reports of 21 banks listed on (PEX) and (ASE). Secondary data, annual reports and disclosures were used between from 2009 to 2019. Descriptive and inferential statistics were used, along with correlation analysis to evaluate linear relationships between variables. Data was collected based on panel data, the VIF was used to test multicollinearity and binary logistic regression was used to develop the research model.

Findings – The regression results showed the association between CR and firm performance depends on the measurement of each factor applied. The results showed mixed results between loans to total assets (LTA) and nonperforming loans to total loans (NPLs) with FP. LTA has a significant and positive effect on TOBINSQ and return on equity (ROE), but an insignificant and positive effect on return on assets (ROA). On the other hand, NPLs have a significant and negative effect on ROA, whereas NPLs have a weak and positive effect on TOBINSQ. However, there is an insignificant and positive effect of NPLs on ROE. Moreover, the results demonstrated that CG moderated the relationship between CRs and FP of banks. The practical contribution of this paper, for bank policymakers and authorities, the study's implications are noteworthy. Understanding the varied impacts of different CR measures on FP can help regulators and policymakers design more tailored and effective risk management frameworks for banks.

Research limitations/implications – This study had limitations that future research might be able to address. First, the small size of the sample used in the study included 21 banks listed on the PEX and ASE. Likewise, the ASE and PEX are considered developing stock exchanges, so the results of this study may differ from those of other stock exchanges. Second, only CRs were considered in this study when examining the association between the profitability of Palestinian banks and ASE. Other studies can be undertaken on other nonfinancial risks, such as operational risk, to measure the differences between them and examine their effects on the profitability of Palestinian and Jordanian banks. Other studies might be performed to compare CRs and its impact on profitability in Palestinian and Jordanian banks with those in other Western and Eastern banks. Furthermore, in addition to TOBINSQ, ROA and ROE, researchers can use other financial indicators to measure profitability. This will contribute to substantiating the present study's findings.

Originality/value – Although several studies have examined the relationship between CRs and FP in developed and developing countries, the results have been mixed. However, this study is one of the few

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studies that examined the moderating role of CG in association with CRs and FP, especially on Palestinian and Jordanian contexts. Finally, the findings offer policymakers and practitioners of Palestinian and Jordanian contexts.

Keywords Credit risk, Financial performance, Corporate governance, Banking industry

Paper type Research paper

1. Introduction

The agency theory, which involves an agency problem between managers and principals, is closely related to corporate governance (CG), especially in banks where agency problems may extend beyond managers and principals to depositors, debtors and regulators; moreover, regulators can have a significant impact on CG in the banking sector (Nurtrontong *et al.*, 2021; Ciancanelli and Reyes-Gonzalez, 2005; Macey and O'Hara, 2003; Marcinkowska, 2012).

The granting of credit is an important objective of banks. Loans constitute an important source of income for banks, but this activity entails high risks for both the lender and borrower (Kargi, 2011). The banking sector, specifically banks, is a crucial sector subject to risks, especially with regard to granting credit. Since deposits constitute about 85% of the bank's liabilities, the bank uses these deposits to extend credit to borrowers. In 1988, three of the largest banks in Benin collapsed, leading to the collapse of 80% of the loan portfolio. In 1993, the nonperforming loans to total loans (NPLs) portfolio reached 70% in Cameroon. As a result, commercial banks were closed, and other banks were restructured (Ugoani, 2016). So, high credit risk (CRs) and a high percentage of nonperforming loans expose banks to the risk of bankruptcy.

The Palestinian and Jordanian economies are similar in that both are considered to be developing economies. In addition, they rely primarily on grants, external assistance and bank borrowing to cover public obligations and expenditures. Moreover, the Palestinian economy is considered a special case because it has been subjected to many constant pressures and challenges caused by Israel's constant cuts in clearing funds, the decline in the amount of grants and assistance to the Palestinian Government, which has been at its lowest level for more than 10 years, and the decline in domestic revenue, which has made the public financial situation more difficult and complex. The government is no longer able to meet its obligations. This has led the government to borrow from Palestinian banks to pay its expenses and obligations, which prompted it to borrow more from the banking sector, increasing the share of public sector credit to 17.2% of the total credit portfolio. Palestinian Monetary Authority (2021) showed a 4.7% increase in the amount of credit granted to public sector employees from 2020 to about US$1,607m, accounting for 17.8% of the total credit portfolio. The credit granted to public sector employees accounted for about 86.4% of the wage and salary bill due in 2019. As a result, credit goes to the government and public sector employees (direct and indirect exposure of the banking sector to the government), which accounted for 35.0% of the total credit granted at the end of 2021, compared to 33.8% in 2020. That is, more than one-third of the credit granted by the banking sector is subject to developments in government finances. This percentage would also increase even further if the credit granted to private sector companies dealing with the government were taken into account. There is no doubt that such a high level of pressure has implications for the banking sector, particularly in the event of irregularities or interruptions in the government's sources of revenue, namely, clearance revenues and foreign grants.

One of the most prominent indicators reflecting the magnitude of the risks associated with the public sector is the rise in the credit ratio granted to the government and public

sector employees to 158.5% of banks' equity, compared to 148.6% in 2018. In a sign that the volume of credits, directly and indirectly, associated with the government far exceeds the total equity of banks, which calls for a vigorous follow-up of the government's financial developments and the necessary precautionary measures to enable the banking sector to deal with them and absorb any shocks that may result from these developments.

Jabarin *et al.* (2019), on the other hand, found that several Palestinian and Jordanian banks still regard CRs as a secondary activity. These issues directly relate to the poor credit conditions of Jordanian banks, which have resulted in an increase in the rate of nonperforming loans and interest rates on loans granted (Central Bank of Jordan, 2017). However, the previous studies that examined the relationship between CRs and FP in Palestinian and Jordanian contexts failed to consider some of the variables, such as age, ownership concentration and the big four, according to the researcher's knowledge. This study fills the gap with respect to the variables considered (Al-Okaily *et al.*, 2022).

In 2001, the Basel Committee on International Banking Supervision issued a set of rules and guidelines for CG, some of which are as follows: the creation of a system that ensures the functions of internal and external audits; dependency management; implementation of justice and equality; incentive distribution; and the creation of a certain kind of control for risk centers, major shareholders and senior management (Basel Committee on Banking Supervision, 2001). The environment in which the financial system in particular functions and the Palestinian and Jordanian economies in general remain unstable as a result of the influence of political and economic factors and fluctuations, both global and regional. The Palestinian and Jordanian banking sectors continue to be considered the main components and influences in the financial system. Intersecting with various sectors of the economy, affecting and being affected by various economic and political changes, which necessitate the need to follow up on the situation of financial stability in light of the changes that are ravaging the domestic and global situation. So, the Palestinian Code of Governance Rules, issued in 2009 and the Jordanian Governance Rules Guide, issued in 2017, guarantee the rights of shareholders. Experience has shown that companies that implement CG rules attract a larger percentage of investors than those that do not (Brown and Cylor, 2004). Its presence implies reaching high levels of performance and profitability (Black, 2000). The implementation of CG in the banking sector can be said to reduce the negative impact of CRs on the performance of banks listed on the PEX and Amman Securities Exchange (ASE) (Nour *et al.*, 2022a). Despite what was mentioned above about the important role of CG, limited research has examined the moderating role of CG in association with CRs and FP around the world (Ko *et al.*, 2019). According to the researcher's knowledge, till date, no study in the Palestinian or Jordanian context has examined the moderating role of CG in the relationship between CRs and FP. Against this background, the researcher believes that it is necessary to conduct this study to bridge the existing gap. In addition, banks listed in PEX and ASE have lacked the benefit of CG implementation (Nour *et al.*, 2022b). From this point, this study supposes that good CG reduces the negative effect of CRs on FP. Based on the above, the following research questions can be formulated:

RQ1. Do CRs affect the FP of banks listed on the PEX and ASE for the period between 2009 and 2019?

RQ2. Does CG affect the association between CRs and the FP of banks listed on the PEX and ASE for the period between 2009 and 2019?

This study aims to investigate the impact of CRs on the FP of the banks listed on the PEX and the ASE. Also, the study highlighted the role of CG in the association between CRs and the FP of banks on the PEX and ASE.

This was done by using a sample composed of 21 banks listed on the PEX and ASE was used. It includes all types of banks listed during the study period of 2009–2019. This study relied on financial and nonfinancial data available through annual reports of banks and disclosures published on the websites of PEX (www.pex.ps) and ASE (www.ase.com.jo/ar) for the period from 2009 to 2019. In addition to relying on the Palestinian CG Code (2009), the Banking CG Code in Palestine (2014), the Jordanian CG Code (2017) and the PMA (2021), data was collected based on panel data.

The significance of the study arises from the subject itself, which is concerned with evaluating and analyzing the relationship between financial risks in banks and their profitability. The granting of credit is an essential financial decision in the banking industry, as the banking industry is an important economic sector in Palestine and Jordan. This study is expected to enable the responsible authorities in these institutions to make better decisions. Additionally, this study is an extension of previous studies that demonstrate the role of CG in the relationship between CRs and FP, which has not been investigated in the Palestinian and Jordanian contexts, according to the researcher's knowledge. Thus, this study works to enrich the scientific library theoretically, so that other researchers and academics can depend on the findings of this study for developing future research.

Our paper makes important contributions. First, this study used combined measures based on accounting and the market, unlike many previous studies (Athanasoglou, 2005; Angbazo, 1997; Chirwa, 2003; Sial *et al.*, 2018; Herawaty, 2008; Flamini *et al.*, 2009; Egesa, 2010) that relied on a single measure of financial performance. As well, using Tobin's Q is one of the most important indicators for measuring FP. It is a more detailed measure that indicates the effectiveness of the administration in managing its economic resources. Second, this paper is considered one of the first studies to examine the role of CG in the relationship between CRs and FP. The findings confirm the important role of CG in reducing the impact of CRs on FP. Finally, the practical contribution of this paper, for bank policymakers and authorities, the study's implications are noteworthy. Understanding the varied impacts of different CR measures on financial performance can help regulators and policymakers design more tailored and effective risk management frameworks for banks. Additionally, the empirical results would provide a general indicator of CG for regulators and decision-makers, thus improving the FP of banks through the adoption of the results and recommendations of the study and increasing the confidence of customers, investors and shareholders in commercial banks. The rest of this study has been structured as follow; Section 2 focuses on the theoretical framework and previous studies related to the subject of the study, in addition to developing the hypotheses. Section 3 focuses on the study methodology in terms of describing a community and a sample; the study, data sources, collection tools, study variables and methods of measuring them, in addition to the statistical methods used in the study. In Section 4, the empirical results are obtained after testing the hypotheses of the study. Finally, Section 5 focuses on the conclusions obtained by this study, the recommendations it presents, the determinants of the study and the proposed research fields.

2. Literature review and hypotheses development

2.1 Credit risk and financial performance

CRs are an important and common risk in the banking sector, and it is defined as the possibility of the borrowers not paying their obligations on the specified date (Mekasha, 2011). According to Stuart (2005), one of the most important reasons for the rise in NPLs is the irregular and insufficient credit guarantee ratio and the inefficient and ineffective risk management. All these factors have an adverse effect on bank profitability. So, to maintain

the bank's continuity, it must keep NPLs to a minimum because exceeding this level would negatively affect the bank's profitability (Jameel, 2014).

The Basel Committee on Banking Supervision (2001) defined CRs as the likelihood of total or partial loss of a loan owing to credit events (Basel, 2001). In 1997, skimping hypothesis was proposed by Berger and DeYoung, which explained the relationship between FP and CRs and indicated that profitability is negatively affected when CRs increases. In this context, the risk-return hypothesis assumes that the CRs will rise if the loan-to-asset ratio is high; this implies that the bank is exposed to high CRs (Benthem, 2017).

Several studies have addressed the impact of CRs on the profitability of banks, whether in developing or developed economies, whose results varied between negative and positive. Abbas *et al.* (2019) indicated that a negative relationship between NPLs and bank profitability in the short term. The study recommended the need for the government to take a set of appropriate measures and procedures to reduce the impact of these risks on the profitability of banks. The results showed that CRs negatively affect the profitability of banks in European, North American and Australian countries. In 2016, panel data was used to measure the impact of CRs on profitability. Bank profitability was measured using the return on equity (ROE), while CRs were measured using the ratio of NPLs to total loans, loans to total equity and loans to total assets. The study found a significant inverse relationship between NPLs and ROE (Ebenezer and Omar, 2016). The empirical evidence found that NPLs, loan loss allowance and capital adequacy ratio and LTA were used to measure CRs, which had a significant impact on the profitability of eight Ethiopian banks between 2003 and 2014 (Gizaw *et al.*, 2015).

Although most prior studies and literature revealed a negative association between CRs and FP, there is evidence and research that shows a positive effect of NPLs, LTA and loans to total depots on bank performance (Hosna *et al.*, 2009; Saaed and Zahed, 2015; Kulum, 2017).

Although previous studies confirmed that CRs have a significant effect on performance, which may be negative or positive, literature and empirical evidence revealed an insignificant effect of CRs on FP (Islam and Nishiyama, 2016; Tan *et al.*, 2017; Bayyoud and Sayyad, 2015).

Moreover, Al-Eitan and Bani-Khalid (2019) investigate how CRs affect the FP of commercial banks in Jordan, specifically those listed on the (ASE) from 2008 to 2017. The findings suggest that CRs have a noteworthy negative influence on both return on assets (ROA) and ROE. In addition, the study found that CRs, as measured by the ratio of doubtful debts to total loans, nonperforming loans and loan losses to total loans, also had a negative and significant impact on both ROA and ROE. On the other hand, the study discovered that total deposits and bank size had a positive and substantial effect on the FP of these Jordanian commercial banks. Alkhatib and Harasheh (2012) conducted a study to assess the economic performance of Palestinian commercial banks. The study used three measures of performance: economic, market and internal. Multiple regression and correlation analysis were used to evaluate the banks' performance. The results indicated a statistically significant relationship between operational efficiency, bank size, asset management and CRs analysis. Thus, this study's hypothesis as followed:

H1. There is a statistically significant effect of CRs on FP of banks listed on the PEX and ASE.

2.2 Corporate governance and credit risk

There is no doubt that the main objective of any bank is to achieve high financial returns. On the other hand, achieving this goal comes with high risks. The return is directly related

to the risks, and the researcher believes that applying the principles of good governance is one of the most important mechanisms and means that enable the bank to mitigate the negative impact of CRs on bank profitability. Many of the previous studies and literature emphasized the role of governance in reducing CRs. Luu (2015) found the application of the mechanisms of the principles of good CG has a strong impact on the risks faced by banks, and the size of the board of directors is negatively related to the level of risk and banks that have a CEO and a high level of ability and control tend to participate in less risky activities. The banking methods and mechanisms pursued by bank administrations have an important role in CR management (Tsorhe *et al.*, 2016). The efficiency of bank executive management has an important role in CR management. Effective governance mechanisms can reduce or exacerbate the conflict between shareholders and managers (agency theory). Al-Hewari (2016) recommended the need for risk management in banks to follow up on the policies and controls related to risk management and the responsibility of the supervisory authorities in banks to control those risks. In addition, governance helps reduce fraud risks and maintain the efficiency of internal operations (Amer *et al.*, 2022).

According to the research conducted by Rose (2017), there is a correlation between the CR exposure of a bank and its CG structure. Switzer and Wang (2013) observed a relationship between the quality of CG and various parameters related to performance and risk. Akdoğu and Alp (2016) investigates how shareholder governance mechanisms affect a firm's CRs, as measured by credit default swap (CDS) spreads. The results indicate that higher levels of antitakeover provisions are associated with lower debt prices. Specifically, for each additional antitakeover provision, the CDS spread decreases by an average of 3.46 basis points. Furthermore, the effect is more significant for smaller, highly leveraged, lower-rated and less profitable firms. Also, Nurtrontong *et al.* (2021) aimed to examine the relationship between CG, CRs and performance in conventional and Islamic banking in Indonesia. The findings indicated that in conventional banking, profitability was affected by the interplay of CG, liquidity and CRs, whereas in Islamic banking, profitability was influenced by the relationship between liquidity and CRs.

2.3 Corporate governance and financial performance

CG guarantees the protection of the rights of shareholders through adherence to the rules of accountability, transparency, the correctness of financial reports and fair access to information from all shareholders, which enhance the value of the company and thus maximize the wealth of owners (La Porta *et al.*, 2000). The implementation of CG would ensure the reduction of the risks related to financial and administrative corruption, increase the competitiveness of national companies and ensure transparency, accuracy and clarity in the financial statements issued by companies. This would, in turn, increase the investors' confidence in the company and dependence on the company, improve the company's management and development, raise the company's value and increase the company's profits owing to investors' demand to buy its shares (Chey, 2013; Brown and Caylor, 2004). Furthermore, this maximizes the market value of the institution in the global financial markets, increases the profitability of these companies and attracts investors, as they tend to invest in companies that have a high level of governance (Chung and Zhang, 2011). Thus, CG is a mechanism and tool to achieve economic growth for any institution (Levine, 1997).

Several previous studies examined the relationship between CG and FP by using individual variables to measure CG. By focusing on the characteristics of the board of directors (Mishra and Mohanty, 2014; Roudaki, 2018; Sabbaghi, 2016; Obradovich, 2012; Black, 2000; Klapper and Love, 2004; Pattanoyak, 2008). Many previous studies examined the impact of the size of the board of directors on the FP of companies from two different

points of view, namely, the agency theory and resource-dependence theory. While the agency theory holds that the smaller the board of directors, the more effective it is, as it can make decisions in less time and reduce agency problems in the board of directors, and that the size of the board of directors correlates negatively with company performance, as well as the large board of directors leads to weak communication between members (Bae *et al.*, 2018). On the contrary, the resource theory assumes that a larger board of directors leads to better decisions through diversity in expertise and competencies, and thus renders a positive relationship between board size and performance (Amaqtari, 2019). In 2005, the existence of a direct and indirect positive correlation between the governance of the board of directors and FP of a group of state-owned companies listed on the Uganda Stock Exchange was revealed (Masibo, 2005). On the other hand, Pieses (2005) obtained different results regarding the impact of CG on corporate performance.

In a study conducted by Paniagua *et al.* (2018), the impact of CG on financial performance was explored in a sample of 1,207 companies from 19 different sectors across 59 countries. The findings indicated that there is a negative association between CG and company performance. A study aimed to investigate the relationship between CG mechanisms and financial performance of family and nonfamily firms listed on Amman Stock Exchange, revealing that while board size has a negative relationship with the performance of family firms, independent directors are strongly related to corporate performance in nonfamily firms and ownership concentration has an insignificant correlation with corporate performance, except for a negative correlation with Tobin's Q in family firms and local investors' ownership is significantly related to corporate performance in both family and nonfamily firms, as measured by Tobin's Q (Saidat *et al.*, 2019).

Despite most previous studies around the world confirming that CG has a significant effect on FP, limited studies stated that there was no relationship between CG and the performance of the firm. Detthamrong *et al.* (2017) collected data on 493 nonfinancial firms in Thailand in 2017. The result showed that CG was not associated with the FP of the full sample, but when splitting the sample into subsamples (both small and large samples), some effect of CG on the performance was observed (Detthamrong *et al.*, 2017).

Another diminution of CG in the literature uses an index of CG; a limited number of studies used this diminution (Brown and Caylor, 2004; Gompers *et al.*, 2003; Core *et al.*, 1999; Bebchuk and Cohen, 2004; Christoffersen *et al.*, 2004). This study used the last diminution in aiming to measure the CG by using the Brown and Caylor (2004) index. The study did not use all of the factors that were included because they did not fit with the CG adapted in Palestine and Jordan.

2.4 Interaction between credit risk, financial performance and corporate governance

Shleifer and Vishny (1997) defined CG as a set of guidelines, structures, rules and procedures that investors use to secure a return on investment and ensure that the managers do not misuse the funds of investors. According to Ko *et al.* (2019), there has been little research on examined the moderating role of CG in the relationship between CRs and FP. Krause and Tse (2016) investigated the relationship between risk management and corporate value. The study found that better risk management procedures, as a substitute for CG, decreased cash flow volatility, improved FP and improved the value of the company. According to Ko *et al.* (2019), a higher level of operational risk occurrences is associated with a greater likelihood of credit default and poor performance. The authors indicate that greater levels of CG are correlated with lower levels of operational risk occurrences, improved performance and reduced chance of credit fault. Lin and Liu (2015) investigated the relationship between research and development (R&D) expenditure and business valuation using Taiwanese

enterprises. A company's value was measured in terms of Tobin's Q and market-to-book ratio, such that a significant positive association was found between Tobin's Q and market-to-book ratio, i.e. the larger the R&D investment, the higher the business value (Nour *et al.*, 2023). Furthermore, R&D growth was found to be positively associated with firm value. Moreover, the researchers discovered a "size" impact. Compared to smaller enterprises, the positive relationship between R&D and company value was strengthened for larger firms. Further, the relationship was impacted by the type of ownership. When the ownership was dominated by insiders, the correlation was weaker than when it was dominated by institutional owners.

According to Najjar (2012), CG has a positive association with profitability and Inam and Mukhtar (2014) found that good CG can enhance both liquidity and profitability in the banking sector, while Fidanoski *et al.* (2014) discovered that the number of supervisory board members positively affects profitability. However, researchers such as Vodová (2003), Sutrisno (2016) and Muthaher (2014) found that CRs do not significantly impact performance or profitability in banking, and there is inconsistency in the relationship between liquidity and profitability, as Khan and Ali (2016) found a positive relationship while using different ratios for liquidity and profitability. Moreover, a study of Nurtrontong *et al.* (2021) indicates that in conventional banking, the combination of CG, liquidity and CRs affects profitability, whereas in Islamic banking, profitability is affected by the combination of liquidity and CRs. Thus, we hypothesis as followed:

H2. The relationship between CRs and FP is moderated by the level of CG for banks in PEX and the ASE.

3. Research design

3.1 Sample selection

In current study, the population comprises all banks listed on the PEX and ASE (21) banks. All banks selected must fulfill the following conditions to form the study sample:

- It will be listed on the PEX and ASE during the study period.
- Access to yearly reports, as well as the data and information required to measure research variables during the study period.

The study sample comprised 21 banks listed on the PEX and ASE. It includes all types of banks listed including commercial, investment and Islamic banks during the period between 2009 and 2019. The study chose the period between 2009 and 2019 for the following considerations:

- Due to mergers or acquisition operations in 2009, so new banks existed such as the National Bank (a merger between Al Rafah Bank for Small Business Finance and Arab Palestinian Investment Bank) and Safwa Islamic Bank; and
- 2019 is the last year due to an exceptional event, which is the coronavirus and, therefore, we removed 2020 and 2021 to exclude the effect of the coronavirus on the performance of banks.

3.2 Data description

This study relied on a group of sources such as research, scientific articles and master's and doctoral theses related to the subject of the study, in addition to websites. Further, this study relied on financial and nonfinancial data available through annual reports of banks and

disclosures published on the websites of PEX (www.pex.ps) and ASE (www.ase.com.jo/ar) for the period from 2009 to 2019. Data was collected based on panel data.

Panel data is defined as a data set that combines the characteristics of each of the cross-sectional data and time series.

In this context, Hsiao (1986) shows that panel data is preferred over time series data or cross-sectional data. An advantage of using panel data is that it takes into account the individual variance, which may appear in the case of cross-sectional or time series data, leading to biased results. It also reduces the possibility of the emergence of the problem of neglected variables resulting from the characteristics of unobserved vocabulary, which usually leads to biased estimates and highlights the importance of using panel data in that it takes into account what is described as "heterogeneity or non-observable difference" of the sample vocabulary, whether cross-sectional or time series data and gives data that is more useful, diverse, less correlated between variables, has a large number of degrees of freedom and is more efficient than time series, which suffer from the problem of autocorrelation.

3.3 Research variable and operational definitions

Independent variable: CRs were used as an independent variable in this study, and there are multiple ways of measuring CRs. Two measures were used to measure CRs, namely, total loans to total assets (TL/TA) LTA and NPLs. These indicators were used with reference to previous studies. LTA TL/TA Bourke (1989), Altunbas (2005) and Flamini *et al.* (2009). NPLs total NPLs to total loans (NPLs/TL) Al-Eitan and Bani-Khalid (2019), Kumbakhar *et al.* (2001), Zhao and Murinde (2011) and Saeed and Zahid (2016).

Dependent variable: as some of previous studies (Al-Okaily, 2023; Athanasoglou, 2005; Angbazo, 1997; Chirwa, 2003; Sial *et al.*, 2018; Herawaty, 2008; Flamini *et al.*, 2009; Egesa, 2010). The dependent variable is FP. This study used combined measures based on accounting and the market. ROA, which measures the amount of profit that a company earns by investing in its assets, is calculated by dividing net income after tax by the company's total assets. It gives an indication of the management's efficiency in using its assets to generate profits. While ROA is shown as a percentage, ROE is the ratio of net income divided by shareholders' equity. It is a common measurement of the company's profitability, and it indicates the amount of profit that the company achieves from the shareholders' investment (Srouji *et al.*, 2023).

Tobin's Q is one of the most important indicators for measuring FP. It is a more detailed measure that indicates the effectiveness of the administration in managing its economic resources. If the value of Tobin's Q is greater than one, it implies that investing in assets generates a higher profit than investing in spending. Investing in investment is useless if the Tobin's Q value is less than one (Al Herawaty, 2008; Mukhtaruddin *et al.*, 2019; Alkhwaldi *et al.*, 2023).

Here, the difference between the two dependent variables, ROA and ROE, should be pointed out. This is due to the financial leverage, or doubling equity, where financial leverage refers to the amount of debt that the company uses to finance its assets, compared to the amount of equity used by the company. This implies that the difference between the two variables is debt. If there is no debt in the company, ROA is equal to ROE. If ROE of the company increases due to the increase in the profit margin or turnover rate of assets (Robin *et al.*, 2018), this is a positive indicator for the company, as it implies that it is effective in using its assets and making profits through sales. If financial leverage is the cause for the rise in equity, it is a negative indicator that the company depends on financing its assets through external debt (Bunea *et al.*, 2019; Robin *et al.*, 2018).

Moderating variable: Shleifer and Vishny (1997) defined CG as a set of guidelines, structures, rules and procedures that investors use to secure a return on investment and ensure that the managers do not misuse the funds of investors (Al-Okaily *et al.*, 2023).

CG was viewed as a moderating variable in this study. It refers to the variables that impact the direction and/or strength of the relationship between the independent and dependent variables (Namazi and Namazi, 2016). CG was used to modify the strength and direction of the association between CRs and FP. The study used a checklist to measure CG following a prior study (Brown and Caylor, 2004). The CG checklist was developed based on the Palestinian CG code issued in 2009 and the Jordanian code of CG issued in 2014. If an item on the checklist is discovered in the bank, it receives a one (1), otherwise, it receives zero (0). The CG index was estimated by computing the average of total items (Brown and Caylor, 2004).

Appendix, lists the items included in the checklist, which were categorized into the following six types: audit, board of director, charter bylaws, compensation, ownership and progressive practices.

Control variables: Several studies (Al-Okaily, M. 2022; Abd Rahman *et al.*, 2020; Alsmadi *et al.*, 2022; Mishra and Mohanty, 2014; Gurusamy, 2017; Al-Okaily, 2023; Islam and Nishiyama, 2016; Sail *et al.*, 2018; Assenga *et al.*, 2018; Aws *et al.*, 2012) use control variables such as ownership concentration, firm size and firm age, as all these variables were relied on as control variables in addition to the Big Four and the percentage of liquidity and, therefore, all these variables will be used to deduce if there are other variables that may affect FP. First, we assume that company size, which is represented by the natural logarithm of total assets, is positively associated with FP (Puni and Anlesinya, 2020). Second, the ownership concentration of the company is measured by the total percentage of shareholders who own more than 5% of the shares. The agency theory is considered to explain the relationship between profitability of banks and ownership. It deals with the relationship between owners and managers (Ongore and Kusa, 2013). The concept of ownership concentration refers to the concentration of the percentage of shares in a company by a few shareholders. Puni and Anlesinya (2020) argue that ownership concentration is positively related to the FP. Third, the age of the company is measured by the natural logarithm of the number of years the company has been listed on the stock exchange, which is positively related to FP (Gurusamy, 2017). Fourth, liquidity refers to the bank's ability to meet its obligations, which can be measured by dividing the liquid assets into the total liabilities. Dang (2011) and Bessey and Moses (2015) argue that liquidity is negatively correlated with the bank's profitability. Finally, the Big Four are included as dummy variables that equal 1 if a listed firm is audited by one of the international Big 4 audit firms or zero otherwise. Sail *et al.* (2018) argue that FP will be increased when the bank is audited by one of the international big four. Table 1 shows the measurement of the control variables that were used in the study.

3.4 Research models

The main argument of this study is to investigate the relationship between CRs and FP and whether CG has an influence on the relationship between CRs and FP of Palestinian and Jordanian banks listed on PEX and ASE during the period 2009–2019. A regression model was developed to examine the hypotheses:

$$\begin{aligned}\text{Firm performance} = {} & \beta 0 + \beta 1(\text{LTA}) + \beta 2(\text{NPLs}) + \beta 3(\text{NPLs} * \text{CG}) + \beta 4(\text{LTA} * \text{CG}) \\ & + \beta 4(\text{BAGE}) + \beta 6(\text{BSIZE}) + \beta 7(\text{LIQUD}) + \beta 8(\text{BIG4}) + \beta 9(\text{OC}) \\ & + \varepsilon \text{it}\end{aligned}$$

Variables	Abbreviations	Operational definitions
Loans to total assets	LTA	Total loans to total assets (TL/TA)
Nonperforming loans	NPLs	Total NPLs to total loans (NPLs/TL)
Corporate governance	CG	A checklist to measure the level of CG
Return on assets	ROA	Net income after tax by dividing total assets
Return on equity	ROE	Net income after tax by dividing total shareholders' equity
TOBINS Q	Tobin's Q	Market value of equity + book value of debt/total liabilities
Ownership concentration	OC	The total percentage of shareholders who own more than 5% of the shares
Bank age	BAGE	The natural logarithm of the company's number of years from the date of its listing on the stock exchange
Bank size	BSIZE	The natural logarithm of total assets
Liquidity	LIQUID	Liquid assets/total liabilities
Big four	BIG4	A dummy variable that is 1 if a listed firm is audited by one of the international Big Four audit firms or zero otherwise

Source: Authors' own work

Table 1. Study abbreviation and operational definition variables

4. Results

4.1 Descriptive statistics

Table 2 presents the descriptive statistics (mean, standard deviation, median, minimum value and maximum value), and how they have been used for each variable were taken into account in the study. The mean score of FP varies between different measures. The mean figures of performance indicators Tobin's Q, ROE and ROA as dependent variables are 0.959, 0.099 and 0.026, respectively. These results indicate a positive return for banks listed in PEX and ASE during 2009–2019. While the mean of ROA is 0.026 for 231 number of observations, it indicates that an investment of one dinar in assets generates only 0.026 of profits, while the maximum and minimum values are, respectively, 0.407 and −0.02, but the mean of ROE is 0.099, which indicates that the investment by shareholders of one dinar achieves 0.099 of profits, and the maximum and minimum value of ROE is 1 and −0.04, respectively. The CG mean score is 0.804, which means that these banks have a high commitment to CG. Further, LTA has a mean of 0.487, which implies loan composite of about 48% of total assets in banks listed in PEX and ASE. On the other hand, the mean of NPLs is 5.669. This percentage is considered lower compared with other countries, such as

Variable	Observations	Mean	SD	Min.	Max.
Tobin's Q	231	0.9590	0.6980	0.0640	9.568
ROA	231	0.0260	0.0490	−0.02	0.4070
ROE	231	0.0990	0.1440	−0.04	1
LTA	231	0.4870	0.0930	0.1710	0.7570
NPLs	231	5.669	3.527	0.030	18.2
CG	231	0.8040	0.0610	0.6250	0.90
FAGE	231	39.186	17.739	6	91
FSIZE	231	9.164	0.4810	7.689	10.42
LIGUD	231	1.782	1.522	0.9390	7.564
OWNERC	231	0.558	0.232	0.065	0.88
BIG 4	231	0.8230	0.3830	0	1

Source: Authors' own work

Table 2. Descriptive statistics

Lebanon, where the NPLs reached 15% in 2019 (PMA, 2019). These results indicate banks listed in PEX and ASE have acceptable levels of NPLs.

4.2 Correlation and multicollinearity analysis

The correlation coefficients were shown in Table 3 to determine the multicollinearity problem between independent variables and to assess the relationship between independent and dependent variables in terms of strength and direction. Table 3 shows a negative and positive relationship between NPLs, LTA and the three measurements of FP, namely, Tobin's Q, ROA and ROE. This means that when the NPLs and LTA increases or decreases, the Tobin's Q, ROA and ROE will also increase or decrease, for other control variables that have significant and weak relationship with the three Tobin's Q, ROA and ROE. However, a test known as the variance inflation factor, or VIF, was used to confirm these results. It reveals that the VIF values vary from 1.094 to 2.193, which is less than 5, meaning that multicollinearity does not exist (Meeamol *et al.*, 2011; Christensen *et al.*, 2010).

4.3 Regression results

Fixed effects regression was used to estimate the relationship between the dependent variables (Tobin's Q, ROA and ROE), independent variables (LTA and NPLs), moderating variable (CG and its interaction with LTA and NPLs) and control variables (firm age, firm size, liquidity, ownership concentration and the big four). Based on the Hausman's test, fixed effect is an appropriate estimation technique. Where the probability ratio was less than 5% for chi-square (AL-Etan and Bani Khaled, 2019). The results showed mixed results between LTA and NPLs with FP (see Table 4). Table 4 shows LTA has a significant and positive effect on TOBINSQ and ROE, but an insignificant and positive effect on ROA. On the other hand, NPLs have a significant and negative effect on ROA, whereas NPLs have a weak and positive effect on TOBINSQ. However, there is an insignificant and positive effect of NPLs on ROE.

The positive significant relationship can be explained as the policy of addressing weak and small banks through the banking merging policy; this has contributed to the creation of banking entities that are close and competitive among themselves. This result in line with previous studies (Koahene, 2012; Saaed and Zahed, 2015; Kulum, 2017). In pursuit of higher returns, banks often take on varying degrees of CRs. When banks extend loans to riskier borrowers or invest in higher-yield but riskier assets, they have the potential for higher profitability. The higher interest rates charged on riskier loans or the potential for

Table 3. Correlation matrix between variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF
(1) TOBINSQ	1.000											–
(2) ROA	−0.052	1.000										–
(3) ROE	−0.110	−0.167	1.000									–
(4) LTA	−0.017	0.020	0.047	1.000								1.465
(5) NPLs	0.041	0.016	−0.009	−0.034	1.000							1.252
(6) CG	0.003	0.154	0.087	0.398	−0.278	1.000						1.634
(7) FAGE	0.016	0.044	0.052	0.089	0.106	0.339	1.000					2.193
(8) FSIZE	0.021	0.030	0.045	0.033	0.205	0.276	0.694	1.000				2.086
(9) LIGUD	0.020	0.053	0.031	0.363	−0.064	−0.018	0.029	−0.105	1.000			1.255
(10) OWNERC	−0.089	−0.184	0.193	0.046	−0.054	−0.082	−0.304	−0.213	0.095	1.000		1.186
(11) BIG4	0.022	0.079	−0.044	0.000	0.168	−0.041	0.056	0.068	−0.021	−0.245	1.000	1.094

Source: Authors' own work

Variable	Tobin's Q	ROE	ROA
LTA	0.031** (4.837)	0.021** (3.19)	0.015 (0.41)
NPLs	0.02* (1.657)	0.023(0.10)	0.003*** (−3.21)
FAGE	0.051*** (4.214)	−0.006** (2.12)	0.001** (1.88)
FSIZE	0.012** (2.108)	0.043** (2.43)	0.007*** (0.61)
LIGUD	0.022*** (−0.92)	0.050** (2.22)	0.001 (0.48)
OWNERC	0.488 (1.50)	0.193*** (2.65)	0.039** (2.15)
BIG 4	0.241** (2.00)	−0.037 (−1.39)	0.013 (1.51)
Constant	21.015 (13.87)	−0.718** (−2.12)	0.013 (0.886)
R-squared	0.494	0.129	0.189
Adjusted *R*-squared	0.511	0.135	0.56
F-statistic	28.340	4.297	19
Prob (*F*-statistic)	0.000	0.000	0.008
Hausman's (1978) specification test		168.792 0.000	

Notes: *T*-statistics are reported in paratheses; ***, ** and *denote statistical significance at the 1, 5 and 10% levels, respectively
Source: Authors' own work

Table 4. Estimation results for the model with TOBINS Q, ROE and ROA as a dependent variable

greater capital gains on riskier investments can lead to improved financial performance. Also, other studies (see Hosny, 2009; Kulum, 2017) reported a positive impact of CRs on the performance of banks.

Furthermore, the significant results of the study concerning the age, size and liquidity of the bank found to exert significant positive relationship with the performance. These results corroborated with other studies (Bisayeha, 2015; Yakuba, 2016; Opoku *et al.*, 2016; Mawutor *et al.*, 2015). Younger banks may be more agile and adaptable to changing market conditions, allowing them to seize emerging opportunities more effectively. They might also have a more modern and efficient organizational structure and technology, which can enhance operational efficiency and performance (Ouimet and Zarutskie, 2014). Additionally, younger banks might have fewer legacy issues and nonperforming assets, leading to better financial health and improved profitability. Larger banks often have access to more resources, including a larger customer base, a wider range of financial products and services and greater economies of scale. These factors can enhance their ability to generate revenue, manage risks and withstand financial shocks. Additionally, larger banks may benefit from better access to funding sources and more diversified loan portfolios, which can contribute to their overall performance.

In the second regression model as shown in Table 5, indicates there is an insignificant effect of CG on TOBINSQ and ROA. This result in line with Detthamrong *et al.* (2017). The results showed that CG was not associated with the FP of the firms in Thailand in 2017. Moreover, the findings revealed a significant effect of CG on ROA. The interaction terms (LTA * CG and NPLs * CG) are positively associated with the FP. When TOBINSQ, ROA and ROE are used as FP measurements, the moderating influence of CG in the relationship between CRs and FP is significant, which is consistent with our hypothesis. The results are line with other studies according to Todorovic (2013), organizations that implement CG effectively have a tendency to exhibit improved performance and profitability. CG has an impact on performance, such that organizations with an inadequate CG framework will generate inferior performance compared to those with a stronger CG framework (Solomon and Solomon, 2020). Moreover, (Al-Matari *et al.*, 2012; Jalal *et al.*, 2023) proposed that

Variable	TOBINS Q	ROE	ROA
LTA	4.244 (1.60)	1.049** (1.92)	0.44** (2.49)
NPLs	0.319* (1.86)	0.1*** (2.82)	0.021** (1.81)
CG	3.427 (0.000)	−0.132 (−0.82)	0.116** (2.11)
NPLs * CG	0.441** (2.01)	0.139** (3.06)	0.032** (−2.16)
LTA * CG	−4.329 (−1.44)	1.455** (2.35)	0.55*** (2.74)
FAGE	0.008** (2.20)	−0.001 (−0.91)	0.001*** (2.60)
FSIZE	−0.656*** (−5.00)	0.078*** (2.90)	0.004 (0.50)
LIGUED	−0.082** (−2.47)	−0.015** (−2.22)	−0.003 (−1.38)
BIG4	−0.049 (−0.41)	0.022 (0.89)	0.014* (1.80)
OWNERC	−0.279 (−1.37)	0.131*** (3.12)	−0.049*** (−3.58)
Constant	6.458*** (5.62)	−0.662*** (−2.79)	0.055 (0.71)
R-squared	0.144	0.141	0.221
Number of observations	231	231	231
F-statistic	4.147	4.029	6.979
Prob (*F*-statistic)	0.000	0.000	0.000

Notes: *T*-statistics are reported in paratheses; ***, ** and *denote statistical significance at the 1, 5 and 10% levels, respectively
Source: Authors' own work

Table 5. Estimation results for the model with TOBINSQ as a dependent variable and CG as a moderator variable

according to agency theory, higher representation of independent directors, which serves as a proxy for CG, would lead to improved performance.

The findings show that implementing good CG structures decreases information asymmetry, reduces agency costs and improves investor confidence. This finding encourages the management to enhance their performance by implementing good CG practices to reduce the impact of CRs on FP in Palestinian and Jordanian banking. These results corroborate with Ko *et al.* (2019). It showed that a higher level of operational risk occurrences is associated with a higher likelihood of credit default and poor performance. Moreover, higher levels of CG are associated with lower levels of operational risk occurrences, stronger performance and a lower likelihood of credit failure.

5. Conclusion

The current study examines the effect of CRs on FP and the moderating role of CG in this relationship on banks listed on PEX and ASE. The results of the regression show mixed results about the effect of CRs on FP. The findings indicate that different measures of CRs have varying impacts on different financial performance metrics. The significance and direction of these effects highlight the importance of considering multiple measures of CRs when assessing a bank's financial performance. Moreover, the results indicate that CG moderates the relationship between CRs and FP when good CG practices are implemented, indicating that adhering to good CG principles reduces the impact of CRs and improves FP.

The theoretical contribution of the study lies in advancing our understanding of the relationship between CRs and financial performance in the context of Palestinian and Jordanian banks, specifically considering the moderating role of CG. By exploring the effect of different measures of CRs on various financial performance metrics, the study provides valuable insights into the complexities of this relationship, emphasizing the need for a nuanced approach when evaluating a bank's financial health.

The study's findings shed light on the importance of implementing good CG practices in banks. When effective CG principles are in place, they can moderate the impact of CRs on

financial performance, ultimately leading to improved outcomes for the banks. This emphasizes the significance of sound governance structures and practices in mitigating the adverse effects of CRs and enhancing the overall financial performance of banks. For bank policymakers and authorities, the study's implications are noteworthy. Understanding the varied impacts of different CRs measures on financial performance can help regulators and policymakers design more tailored and effective risk management frameworks for banks. By identifying the moderating role of CG, the study underscores the importance of promoting and enforcing strong governance practices in the banking sector to foster resilience and stability.

6. Limitations

However, this study had many limitations that future research might be able to address. First, the small size of the sample used in the study included 21 banks listed on the PEX and ASE. Likewise, the ASE and PEX are considered developing stock exchanges, so the results of this study may differ from those of other stock exchanges. Second, only CRs was considered in this study when examining the association between the profitability of Palestinian banks and ASE. Other studies can be undertaken on other nonfinancial risks, such as operational risk, to measure the differences between them and examine their effects on the profitability of Palestinian and Jordanian banks. Other studies might be performed to compare CRs and its impact on profitability in Palestinian and Jordanian banks with those in other Western and eastern banks. Furthermore, in addition to TOBINSQ, ROA and ROE, researchers can use other financial indicators to measure profitability. This will contribute to substantiating the present study's findings.

7. Recommendations

The findings of this study indicate that CG moderates the relationship between CR and FP; this means that adhering to good CG principles reduces the impact of CR. This, hence, improves FP when good CG practices are implemented. Mixed results were found regarding the pure relationship between CR and FP. A significant relationship was found between LTA, TOBINSQ and ROE, but an insignificant effect on ROA. However, NPLs have a significant and negative effect on ROA, whereas it has a significant and positive effect on TOBINSQ.

In light of the findings of this study, it recommends the following:

- the importance of paying attention to bank loans, implementing more effective credit processes and banking policies and assuring that potential borrowers' credit is appropriately assessed;
- the necessity to allocate sufficient provisions to face any possible decline in credit facilities;
- the requirement of banks and financial institutions to rely on risk-related models and applications to ensure that the value of the bank's assets is not decreased in value;
- CG policies having a substantial influence on FP, the need for the government to develop CG standards that reflect their own business environment to strengthen CG;
- constantly reviewing CG codes and learning from developed countries' experiences in corporate and bank governance, as well as directing companies to pay attention to CG practices through laws and legislation that require companies to follow CG practices; and
- conducting workshops on CG and its importance in the presence of company management and decision-makers.

8. Recommendations for future research

Only CRs were considered in this study when examining the association between the profitability of PEX and ASE. Other studies can be undertaken on other nonfinancial risks, such as operational risk, to measure the differences between them and examine their effects on the profitability of Palestinian and Jordanian banks. Other studies might be performed to compare CRs and its impact on profitability in Palestinian and Jordanian banks with those in other Western and Eastern banks. Furthermore, in addition to TOBINSQ, ROA and ROE, researchers can use other financial indicators to measure profitability. This will contribute to substantiating the present study's findings. Furthermore, the sample size of future research might be increased.

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Appendix

#	Items
1	The audit committee is composed solely of outside directors who are all independent
2	At the most recent annual meeting, the auditors were confirmed
3	Auditor consulting fees are lower than audit fees paid to auditors
4	Auditor rotation is regulated by a specific policy at the company board of director
5	At least 75% of board meetings were attended, or all directors had a valid excuse for not attending
6	The board of directors must include at least six but no more than 13 members
7	In the proxy statement, the CEO is not identified as having a "related party transaction"
8	More than half of the board is composed up of independent outside directors
9	The compensation committee is composed entirely of outside directors who are not employees of the company
10	The CEO and chairman's duties are separated
11	Shareholders have a vote in who is selected to fill vacancies on the board of directors
12	Changing the board size needs shareholder approval
13	Only independent outside directors make up the nomination committee
14	Shareholders have cumulative voting rights to elect directors bylaws/charter
15	A merger must be approved by a simple majority vote (not a supermajority)
16	Shareholders are allowed to call special meetings
17	To change the charter or bylaws, a majority vote is required (not a supermajority)
18	Shareholders can act with written approval that does not have to be unanimous
19	The board can only alter the bylaws with shareholder approval or under restricted situations
20	There are no interlocks among the compensation committee's directors
21	Nonemployees are excluded from corporate pension plans
22	Shareholders voted to approve stock incentive plans
23	All or a portion of the fees paid to directors are received in stock
24	The company does not lend money to executives who want to exercise their stock options
25	All directors with more than one year of service own stock
26	Executives are subject to stock ownership guidelines
27	There is a mandatory retirement age for directors
28	The board's performance is evaluated on a regular basis
29	A CEO succession plan has been approved by the board of directors
30	The board has external consultants
31	When their work status changes, directors must submit their resignations
32	Outside directors meet without the CEO, and the number of times they meet is disclosed
33	Director term limits exist

Source: Brown and Caylor (2004)

Table A1. Corporate governance index

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