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A study on the relationship between Corporate Social
Responsibility and Financial Performance in the Global Banking
Industry

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Abstract

Research on corporate social responsibility (CSR) and financial performance (FP) has been prevalent, however, it is primarily investigated using aggregated industry information. Literature on this topic is scant in the banking industry when banks are crucial to society and the economy. Therefore, this paper aims to explore the CSR-FP relationship from a global banking perspective, using net interest margin (NIM) and return on assets (ROA) as measures of FP. Based on a sample of 156 banks from 49 countries from 2017 to 2020, this study makes use of the panel regression model to determine the direction and magnitude of CSR on FP and to test whether certain contextual factors (e.g., a country's development status) moderate the relationship. The results show that banks' CSR positively and significantly influences their FP and future FP. The influence of CSR on FP is significantly different between economies, wherein the CSR-FP relationship is stronger in developing countries. The findings convey the need for banks to engage in CSR, especially in developing economies, where the use of resources for CSR could mean improving the welfare of banks' stakeholders and subsequently their profits.

Keywords: Bank CSR, Financial Performance, Institutional Context, Global Banking

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Chapter 1 Introduction

Corporate social responsibility (CSR) is an important notion due to the growing public interest in companies taking pro-social actions. The adoption of CSR has initially raised concerns if businesses are derailed from the primary objective – to maximize the profit of their owners (Friedman, 1970). However, a 2021 Deloitte survey shows that our current generation strongly demands a future where corporations prioritize people and the environment over profits. This can consequently lead to potential losses for the company as consumers and employees may find it ethically reasonable to avoid transacting with a business that does not implement CSR. Hence, to retain its customer and talents, an organization might commit to its CSR objectives. In the book "Strategic Management: A Stakeholder Approach", Freeman (1984) elucidates that stakeholders can influence the way a business realizes its objectives. The ability of an organization to maintain its connections with the stakeholders, such as the consumers, employees, and the community would be imperative to its success. As the CSR of a company has a role in the stakeholder relationship it has, research can be done to investigate the effect of CSR on a firm's financial performance (FP).

1.1. Research Problem & Motivation

The past literature has uncovered CSR and FP findings from the perspective of combined industries, such as manufacturing, retail, and transport. By employing aggregated industry data, differences in the implementation of CSR per sector may not be controlled and this would impact the internal validity of the research (Simpson & Kohers, 2002). Certain industries, such as banks, are often excluded from the general CSR-FP studies. With that, this paper aims to investigate the CSR-FP relationship in a specific industry: the banking sector.

The banking industry is an interesting area of CSR research because there has been the development of banks in many countries to provide capital for sustainable purposes (EY, 2020). One of the driving factors for the integration of CSR practices in banks is climate change, and a report from EY (2020) showed that 52% of the surveyed banks perceive an environmental risk to become increasingly salient. According to a KPMG report, banks exhibit the highest rate of CSR reporting in comparison with other industries to show how they engage with stakeholders, determine environmental and social risks as well as the corporate responsibility governance and strategies ("Corporate Social Responsibility in the Banking Sector," 2016). Many banks today are contributing to social, economic, and sustainable development with green credits, microfinance, or improved support for impoverished communities (Scholtens, 2009; Zhou et al., 2021). Despite the banking industry is also one of "the first to engage in CSR" (Scholtens, 2009; Soana, 2011; Gangi et al., 2019), poor corporate governance in the industry was overlooked. During the 2008 financial crisis, many banks experienced failure and bailouts due to imprudent lending behavior. As they were

struggling to cover large losses caused by the credit boom, central banks had to provide lending on an enormous scale at the cost of taxpayers (Ivashina & Scharfstein, 2010). The failure of multiple banks, such as the Lehman Brothers, has made a serious impact on the global economy (Ivashina & Scharfstein, 2010; Platonova et al., 2016). The crisis is followed by the worsening reputation of the financial institutions which calls for banks to scrutinize their CSR practices.

There are a plethora of studies discussing the conduct of CSR in banks, especially after the financial crisis of 2008. However, research linking the concept of CSR to bank FP is scant. A few studies are done in certain geographies: China (Zhou et al., 2021), the Gulf region (Platonova et al., 2016), Italy (Soana, 2011), and the US (Simpson & Kohers, 2002). The conclusion in banking is also mixed, with the recent study positing that CSR activities negatively affect bank FP (Zhou et al., 2021), while others found a positive link (Platonova et al., 2016; Gangi et al., 2019). Other scholars only focused on the evaluation of bank CSR policies, without relating it to FP (Athanasoglou et al., 2008; Scholtens, 2009; Hu & Scholtens, 2012). It is crucial to examine the relationship between bank CSR and FP because there are implications from real events where bank misconduct has led to detrimental effects both internally and externally.

Banks are intermediaries between lenders and borrowers, with this function banks help give financial access to innovative businesses and the support of an efficient market. But if the banking system fails, then players in the economy would bear the cost as well. The functioning of banks hence depends on good conduct and governance. Therefore, making responsible decisions and engaging in CSR could be a motivation for banks to attain sound financial performance.

1.2. Research Objectives

This study extends the literature by looking at the causal relationship between CSR on FP in the banking industry from a global perspective. The objective of the research is to ascertain whether banks could be financially successful while incorporating socially responsible practices, as there is a dispute between the stakeholder and trade-off theories. The research question is: **What effect does corporate social responsibility have on financial performance in the banking industry?** The research will take inspiration from and refine previous empirical models to answer the research question. The paper would rely on sample global data of commercial banks, where reliable and relevant financial and CSR information is accessible.

The secondary research is to further analyze whether the link is contingent on the economic environment or the development status of the bank's operating country. The theory of this assumption is explained in the literature review section.

1.3. Research Outline

The remaining part of this paper proceeds as follows. Chapter 2 presents the literature review which includes a summarized overview of CSR-FP research in the general literature and then the banking industry.

The hypothesis is developed from a comprehensive analysis of the past studies. Chapter 3 provides explanations of the methodology, which includes the research design, variables, and the models chosen to test the hypotheses. This study uses a panel regression method to answer all hypotheses. Chapter 4 contains the summary statistics of the panel data and all regression outputs, along with the discussion of the result. Chapter 5 consists of the conclusion of the findings and the final evaluation of the research question, followed by the research implications, limitations, and suggestions for future research.

Chapter 2 Literature Review

2.1. Overview of Corporate Social Responsibility (CSR) and Financial Performance (FP)

Research on CSR and corporate financial performance (FP) has been conducted extensively over the past 20 years. However, studies show conflicting results in the direction, strength, and causality of the relationship. On one hand, CSR may be seen to burden companies with extra costs that do not necessarily yield beneficial returns as stipulated by studies following the "trade-off hypothesis" (Friedman, 1970; Preston & O'Bannon, 1997). Meanwhile, this argument is challenged by the finding that companies spending resources on CSR show that the interests of the stakeholders involved are responded to favorably. In return, firms could improve their potential profits based on good stakeholder relationships (McGuire et al., 1988; Wang et al., 2016; Iqbal et al., 2019; Ali et al., 2019).

Many studies have confirmed the positive relationship based on the stakeholder theory, which prescribes that firms can profit from CSR by satisfying the expectations of their stakeholders, such as customers and employees (Freeman, 1984). Conversely, if a company fails to keep its stakeholders happy, this negatively impacts value creation and harms profitability. Ioannou and Serafeim (2012) found that firms would improve their stakeholder relations by practicing CSR, which in turn also improves their trustworthiness. The authors contended by building a better reputation, firms could keep their customers, make new partnerships, improve access to capital, and thus increase firm performance. Firms' corporate social engagement is seen as "manifestations of attempts to establish cooperative stakeholder relationships" (Jones, 1995, p. 430). This clarifies that CSR could be viewed as a stakeholder value-creating strategy to enhance firm performance.

Furthermore, fulfilling key stakeholder needs also implies good management (Waddock & Graves, 1997). Although Waddock and Graves (1997) found that some firms engage in CSR at first just to appear good, the study concluded that such CSR implementation would over time change management institutionally and even *actually* improve stakeholder relationships. This idea is extended by Surroca et al. (2010), whose research elaborated on how CSR is an intangible asset that enables firms to secure stakeholder resources, therefore creating a competitive advantage. A recent study by Ali et al. (2019) also

agreed that implementing CSR could provide firms with a competitive advantage through increased customer satisfaction and corporate image. The positive effect of CSR on a company's reputation is also confirmed by Iannou and Serafeim (2012). Other positive findings in the literature discuss the role of shareholders, which other than stakeholders, also provide companies resources through investments. A study by Flammer (2013) demonstrated that positive stock market reaction takes place to company green initiative announcements. This shows how the success and growth of firms could be shaped by socially responsible and environmentally conscious investors. Similar studies have also found how the cost of capital in firms is influenced by their CSR. Cheng et al. (2014) conveyed that firms practicing CSR would not only achieve superior stakeholder engagement but also are likely to be more accountable and transparent. Having this position could decrease both information asymmetry and agency costs, which in turn help firms to lower capital constraints and obtain more funding to become successful (El Ghouli et al., 2011; Cheng et al., 2014). From the literature discussed, there is evidence that CSR positively influences FP via the stakeholder and the shareholder theories.

Despite most literature corroborating positive findings, there are also negative and even no CSR-FP relation found. Friedman (1970) held a strict view of the shareholder theory, in which a firm is responsible to maximize profits in the best interest of its owners. According to this perspective, having CSR is not profit-generating and is thus considered an expense (Friedman, 1970). It is even considered a source of competitive disadvantage (Friedman, 1970; Aupperle et al. 1985). Preston and O'Bannon (1997) elucidated that the benefits of CSR do not outweigh its costs, as a result, their study found negative CSR-FP relation. This conclusion is also drawn in a study by Kim et al. (2015) in the condition that the CSR-FP relationship is explicated with a competitive action factor, which measures a firm's effort to be innovative in its products or services. Kim et al. (2015) argued while CSR represents the ethical responsibility of a firm, competitive action denotes its economic responsibility. The research found socially *irresponsible* practices, or those deflecting from stakeholder expectations, would increase firm performance when competitive action is not sufficient.

Empirical research supporting no CSR-FP relationship or non-significant results due to the ambiguity of CSR benefits also exists (Aupperle et al. 1985; McWilliams & Siegel, 2000). According to McWilliams and Siegel (2000), each firm selects the level of CSR depending on its demand and supply such that all firms will have their profit maximized and thus equal. While this implies neutrality, other studies provide mixed results suggesting whether firms can profit from CSR depends on how well they can capitalize on their CSR activities (Barnett & Salomon, 2012). It is shown that FP decreases initially to an increase in CSR activity but improves afterward.

2.2. CSR and FP in the banking sector

Since most CSR-FP studies have been based on samples of different industries, the conclusion may not apply to every industry considering the differences in CSR implementation. Within the banking industry, CSR is defined as the responsibility banks have for their impact on the environment, biodiversity, and climate change in addition to its directly involved consumers (UNESCAP, 2014). Although by this definition banks may share similar CSR conducts with other industries, banks' CSR is often undermined because their services and products do not provide direct externalities, compared to the manufacturing industry (Mita et al., 2018).

As financial intermediaries, banks can enforce stringent policies for lenders and borrowers to prevent the financing of socially irresponsible activities. Aside from engaging with trustworthy clients, banks can also conduct CSR through community involvement. A study by Scholtens (2009) found that there is a significant increase in CSR performance among 24 European banks, six North American, and four from Asia-pacific in 2005 compared to the year 2000. Although the study does not answer why banks CSR improves, Scholtens (2009) insinuated that financial motivation has a role and this paves a way for research on the bank CSR-FP relationship.

2.2.1. Positive Relationship

Simpson and Kohers (2002) collected a sample of 385 U.S. national banks from 1993, that perform basic commercial banking duties such as providing loans and receiving deposits. The Community Reinvestment Act of 1977 (CRA) rating indicates if banks' community service is either outstanding or needs improvement. The study showed that higher CRA-rated banks are 78% more profitable than those needing improvement, and this is consistent with the stakeholder theory and the theory that CSR costs are outweighed by the benefits (Waddock and Graves, 1997). In the study of the gulf region, Islamic banks covering the period of 2000-2014, Platonova et al. (2016) indicated there is a significant positive relationship between CSR disclosure and FP. While no causation links are determined by Simpson and Kohers (2002), Platonova et al. (2016) examined why the positive CSR-FP link existed and they found that Islamic banks are built on CSR objectives. Islamic banks need to comply with religious and moral conduct such that they are perceived as Islamic by their target stakeholders and shareholders, and only by following this obligation would they be profitable. Although the case of Islamic banks is special as CSR is an endogenized practice affecting the core operations, CSR is still relevant to the profitability of conventional banks in other regions. Gangi et al. (2019) extended the CSR-FP research on European banks while emphasizing CSR knowledge (CK) management. The ability to streamline CSR into business operations relies on how CK is shared and understood among employees. The study found that CK or internal CSR influences banks' citizenship performance which in turn positively affects FP.

2.2.2. Other Relationships

In contrast to the positive link, Soana (2011) reported no financial advantage for banks to invest in socially responsible activities. The research used a sample of 31 Italian banks, where CSR is dissected into indicators, such as corporate governance, product, and environment, which are analyzed to accounting and market-based FP measures. The results showed that CSR does not correlate with the financial indicators, supporting the neutral view of the relationship as Aupperle et al. (1985) proposed. This view implies that banks could practice CSR without sacrificing their "bottom line". A negative CSR-FP link is also found by Zhou et al. (2021), which studied the banking industry in China from 2008 to 2018. From 12 large Chinese commercial banks, results showed that in the short term, Friedman's (1970) trade-off theory is supported as CSR would burden banks financially. However, the scholar argued that in the next year, the benefits of CSR are accrued in terms of decreased environmental risks and increased transparency, all of which positively affect FP. Compared with how the U-shaped relationship hypothesized and confirmed by Barnett and Salomon (2012), Zhou et al. (2021) did not utilize a quadratic regression model but inferred that the negative effect is just temporary without empirically proving when and how the effect would change.

With most findings discussed from all industries and the banking sector, a considerable amount corroborated a positive CSP-FP link. Since CSR-FP research on the global banking industry is still very limited, this thesis aims to investigate the relationship empirically. The following hypothesis is tested:

H1a: Corporate Social Responsibility has a positive effect on the financial performance of commercial banks.

The effect of CSR on subsequent year performance is widely considered in many studies (McGuire et al., 1988; Preston & O' Bannon, 1997; Waddock & Graves, 1997; Platonova et al., 2016). The benefits of investing in CSR may accrue in later times as conjectured by Waddock and Graves (1997). Lagged CSR variables are used against current measures of firm profitability to address endogeneity problems (Waddock & Graves, 1997; Surroca et al., 2010; Zhou et al., 2021). Other studies which drew the U-shaped relationship implied that there is a long-term implication beyond the present (Barnett & Salomon, 2012; Zhou et al., 2021). The sub-hypothesis is as follows:

H1b: Corporate Social Responsibility has a positive effect on the future financial performance of commercial banks.

2.3. Moderators in CSR-FP relationship

2.3.1. Reputation

A firm's reputation, whether it is trustworthy, reliable, or appealing to the preferences of its consumers, is found to impact performance (Wang & Berens, 2014; Ali et al., 2019; Gangi et al., 2021). By engaging in

CSR, firms can enhance or safeguard their reputation from potential damage by not fulfilling stakeholders' expectations (Soana, 2011). Gangi et al. (2021) used citizenship performance to measure the strength of a bank's stakeholder relationship, and it was found that it improves loan quality and in turn, bank FP.

Wang and Berens (2014) found that CSR affects each type of stakeholder differently, and firms can invest in CSR to decide how they want to be seen by each stakeholder. Ali et al. (2019) surveyed managers of Pakistani listed companies and found that not only does CSR has a significant positive relationship with FP, customer satisfaction and customer image are found to partially mediate the association. The research concluded that CSR enhances the positive image of the firm and increases customer satisfaction, which accordingly improves profitability. Overall, the vast CSR-FP literature has clarified that reputation has a moderating effect on banks and other industries.

2.3.2. Capital

Many studies identify a firm's access to financing, such as the cost of capital, to be influenced by CSR and this, in turn, affects a firm's ability to fund its profitable investments (McGuire et al., 1988). From 2,439 public listed company data from 2002 to 2009, Cheng et al. (2014) found that firms with higher CSR ratings are found to have significantly lower capital constraints and better stock performance. This research is consistent with the finding of El Ghouli et al. (2011) that high CSR is associated with a lower cost of equity capital than low CSR firms. Having more capital enables firms to make strategic decision-making processes, which increases FP and firm value. Within the banking industry, the relationship between bank capital and profitability instead of the cost of capital and CSR is examined (Athanasoglou, 2008; Lee & Hsieh, 2013). This is because capital is derived in banks from assets and liabilities differences while other businesses can raise capital from debt and equity financing. Athanasoglou (2008) elucidated that banks' capital works as a "safety net" to cushion off adverse risks, and banks demonstrate corporate governance and CSR by adhering to the capital regulations. The study found that capital improves profitability among Greek banks and a similar result was obtained in Asian banks (Lee & Hsieh, 2013). This validates the mediating effect of capital in bank CSR-FP research.

2.3.3. Green credit

Specific to the banking industry in China, Zhou et al. (2021) examined the green credit policy as it is mandated by the Chinese government to combat pollution in Chinese cities. The green credit policy encourages banks as lenders to give out "green loans" such that they are used restrictively by borrowers for sustainable development purposes. Zhou et al. (2021) investigated the moderating role of green credit in the bank CSR-FP relation as previous studies only focused on bank green credit policy (Scholtens and Dam, 2007). Scholtens and Dam (2007) found there are significant differences in terms of CSR behavior between international banks that adopt and do not adopt the policy. The study also suggested that shareholders are indifferent to the adoption of the policy, so the differences in financial performance, such

as shareholder value, are not significant. Meanwhile, Zhou et al. (2021) found that the interaction term of CSR with green credit is significant to bank FP, thus green credit enhances the effect of CSR on FP in Chinese banks.

2.3.4. Environmental Context

A salient cause of the variation in the findings of bank CSR-FP is the environmental context the research is set upon. For example, while Zhou et al. (2021) found that financial returns from CSR are unfavorable within Chinese banks, Simpson and Kohers (2002) revealed the contrary for US banks. By comparing 42 CSR-FP studies, Wang et al. (2016) identified the role of institutional factors and economic conditions, like those between a developing or developed nation, to moderate the relationship. Wang et al. (2016) argued that in less developed countries, corporations worry less about regulatory sanctions due to lenient CSR enforcements. They theorize also that developing nations may be exposed to higher information asymmetry from weak information channels, causing firms' CSR performance to be less visible. As a result, firms may fail to communicate to their shareholders the complete picture.

As the banking sector is imperative to economic development, Hu and Scholtens (2012) researched the CSR policies of banks in developing economies. From their analysis of 44 countries, Hu and Scholtens (2012) found that countries granting freedom of expression and voting (which is often associated with developed countries) would have higher CSR-scoring banks. The study implies that an open and free government may stimulate banks to engage in their CSR efforts, supporting the finding of Ioannou and Serafeim (2012) that institutions shape CSR engagement. Their study found that corporations in less corrupt countries perform better CSR, as in corrupt nations firms could get away with unethical behavior such as bribery and child labor.

Although there are already studies providing policy implications on firm CSR, little is known about the moderating effect of environmental context in CSR-FP research. Wang et al. (2016) found that the CSR-FP relationship is stronger in developed countries, compared to developing countries, however, the research did not focus on banks. Considering the differences in institutional factors, such as free speech and corruption, this thesis extends the findings of Hu and Scholtens (2012) and Ioannou and Serafeim (2012) by empirically investigating if a country's development status relates to the financial advantage banks can achieve from their CSR. As implied by Wang et al. (2016) that in a developed economy where institutions are characterized by less corruption and more transparency, CSR actions would less likely be financially disadvantaging because not only it is stimulated by the law, but such CSR conducts would be more likely be visible to the public. Thus, banks in developed countries could benefit more from CSR actions than in developing countries.

Based on this reasoning, the hypothesis is as such:

H2: The positive relationship between CSP and CFP is significantly stronger for banks from developed countries than for banks in developing countries.

Table 1A. Summary of literature on Bank CSR-FP

Authors (Year)	Period	Countries	Methodologies	Results (sign)
(Zhou et al., 2021)	2008-2018	12 banks in China	Regression analysis	CSR impacts FP negatively in the short term, green credit mediates the relationship (-)
(Gangi et al., 2021)	2009-2015	72 banks in Europe	Fixed-effects panel regression analysis	Internal bank CSR affects citizenship performance, which positively affects FP (+)
(Platonova et al., 2016)	2000-2014	24 Islamic banks in Gulf Corporation Council	Fixed-effects panel regression analysis	CSR is positively related to bank FP (+)
(Soana, 2011)	2005-2006	31 Italian banks	Correlation analysis	No statistically significant link between bank CSR and FP (null)
(Hu & Scholtens, 2012)	2007	44 developing countries	Exploratory regression analysis	Bank CSR is positively associated with bank and country-specific characteristics (+)
(Simpson & Kohers, 2002)	1993-1994	385 commercial banks in the US	OLS regression analysis	Bank CSR is positively linked to bank FP (+)
(Mita et al., 2018)	2014	77 banks in 5 ASEAN countries	Cross-sectional, correlation analysis	Bank CSR is positively correlated with FP (+)

Chapter 3. Methodology

3.1. Research Design

To perform empirical research on the hypotheses, the thesis requires mathematical model specifications along with secondary bank-level and macroeconomic data. As explained in the next section, company ESG scores data will be obtained from *Thomson Reuters Datastream*, a database covering 6000+ public companies worldwide. ESG scores are accessible for 191 commercial banks from all regions, and these are subsequently matched with their annual financial data. The ESG score reports how well a bank performs against the environmental, social, and corporate governance pillars in equal weighing.

The study uses strongly balanced panel data from 2017-2020, resulting in a population of 624 observations. There are a variety of empirical methods used in the CSR-FP literature. A correlational analysis was chosen to show the degree of association between CSR and FP (McWilliams & Siegel, 2000; Soana, 2011; Mita et al., 2018). However, the goal of this research is to confirm more than just a relationship, but also how CSR impacts FP. With Ordinary Least Square (OLS) regression, the dependent variable is FP, the independent variable is CSR and the parameters can be estimated to test the hypotheses.

3.2. Variable Measurement

3.2.1. Construction of CSR variable

There are countless measures for CSR in the literature without a clear consensus. The first example is using the CSR disclosure index, which reflects the CSR activities banks undertake as shown in their annual reports. Platonova et al. (2016) claimed that it is the most efficient method, however annual report information is still subject to the firm's discretion and greenwashing. Besides the possibility of hiding the truth, there is inconsistency in assigning scores to the declared CSR information. The second example is by indicating whether the company is in the sustainability index (McWilliams & Siegel, 2000), such as Dow Jones Sustainability World Index, or by categorizing bank CSR performance (Simpson and Kohers, 2002). This is problematic as the categories are too few to sort out the diverse levels of CSR from hundreds of banks, moreover, the Community Reinvestment Act rating is not universally applicable. The third example is to employ questionnaire surveys to get responses on firm CSR conduct, but this method is biased to the manager's judgment (Aupperle et al., 1985; Ali et al., 2019).

Most studies concur that a multi-dimensional rating of CSR should be used as CSR comprises a range of behavior, from philanthropic duties to environmental support (Waddock & Graves, 1997; Barnett & Salomon, 2012; Zhou et al., 2021). To account for this variety, environmental, social, and governance (ESG) criteria assessment scores are used from social research agencies such as Kinder, Lydenberg, and Domini (KLD) (Waddock & Graves, 1997; Barnett & Salomon, 2012; El Ghouli et al., 2011; Kim et al., 2015; McWilliams & Siegel, 2000) and Thomson Reuters ASSET4 (now known as Datastream) (Gangi et al., 2019, Cheng et al., 2014, Ioannou & Serafeim, 2012). Although the database remains to be imperfect, they are encompassing and representative of the stakeholder's assessment of CSR performance, as data is taken from internal and external sources "using the same consistent criteria from year to year" (Surroca et al., 2010). Given the multidimensional ESG score is more reliable than the other measures discussed, this is operationalized as the CSR variable of this thesis.

3.2.2. Financial Performance Variables

Previous literature has employed either or both accounting and market-based measures of firm performance. In terms of CSR-FP research for all industries, scholars use variables, such as stock returns and Tobin's Q as market-based measures (McGuire et al., 1988; Kim et al., 2015; Wang & Berens, 2014). Wang and Berens (2014) argued that Tobin's Q provides a complete perspective of firm profitability as it reflects growth potential and may not need adjustments for risk. As market-based measurements consider the valuation of shareholders, managerial manipulation is also less likely (McGuire et al., 1988; Wang & Berens, 2014). In the study of banks, however, using an investor's evaluation such as Tobin's Q is not adequate to determine profitability as banks generate profit differently than most other businesses. Furthermore, it is argued that the market-based measures could be influenced by factors other than the firm

performance per se, as the stock market is volatile to systematic changes (McGuire et al., 1988; Simpson & Kohers, 2002; Platonova et al., 2016).

Many studies that employ accounting-based measures in the CSR-FP study made use of profitability ratios, such as return-on-assets (ROA) and return-on-equity (ROE) (Waddock & Graves, 1997; Barnett & Salomon, 2012). Although ROE is identified as an FP measure, it is found to ignore the effect of leverage in banking (Dietrich & Wanzenried 2011) and it is strongly correlated with ROA (Simpson & Kohers, 2002; Platonova et al., 2016). This study excludes ROE as an FP measure as ROA is the vital and foremost indicator of bank performance, and its usage is well-established in the literature (Simpson & Kohers, 2002; Soana, 2011; Platonova et al., 2016; Zhou et al., 2021). In the banking sector, ROA denotes how much banks profit from their assets, which are mostly comprised of loan money. Besides ROA, other scholars identify net interest income (NII) as an FP variable for banks. NII shows the difference between the number of interest banks earn from their assets, such as loans, and paid out on their liabilities, such as deposits. Gangi et al. (2019) proxied bank efficiency using Net Interest Margin (NIM), or NII per total assets. This thesis follows the literature by using two accounting-based measures, such as ROA and NIM, to proxy bank FP as this method is more suitable than using market-based measures.

3.2.3. Moderating Variable

To factor in the environmental context, a dummy variable *Developed* is constructed to reflect on whether the bank belongs to a developing or developed country. This information is based on the World Bank designation of a country's economic development.

3.2.4. Control Variables

The thesis follows previous investigations in controlling certain variables. The size of banks in the sample varies from each other and much research identified its association with profitability, thus it needs to be controlled (Athanasoglou et al., 2008; Platonova et al., 2016). Size is proxied using the logarithm of total assets, as identified in many studies. After size, CSR-FP studies on banks also control loan and capital ratios (Simpson & Kohers, 2002; Platonova et al., 2016). The capital ratio is measured as equity per total assets, and it is an endogenous variable that denotes whether banks have adequate capital to cushion against adverse risks (Athanasoglou et al., 2008; Simpson & Kohers, 2002; Platonova et al., 2016). Loan and capital ratios are controlled as they might be associated with profitability, as banks would make a profit from the interests earned in loans and well-capitalized banks are found to perform better (Athanasoglou et al., 2008). The debt ratio, which represents the bank's long-term debt, is also controlled because it may be associated with FP. Platonova et al. (2016) argued that debt restricts banks from becoming profitable as it puts banks at risk. Risk is controlled in most CSR-FP studies because it is found to skew results (Aupperle et al., 1985). The previous study also proxied risk using debt ratio (Waddock & Graves, 1997; Barnett & Salomon 2012).

According to the literature, macroeconomic factors should also be controlled because bank costs and income could be influenced by the operating country's economic conditions (Zhou et al., 2021). Simpson & Kohers (2002) identified population as a factor as they could determine how much banks get deposits and make loans; however, most studies use the GDP per capita (Platonova et al., 2016; Gangi et al., 2019). As GDP per capita is a measure of "the value of output per person" in a country (World Bank), it would show heterogeneous economic conditions. Hence, it should be a controlled variable.

3.3. Data Analysis Method

The study uses panel data because it observes the information of the same banks or entities for four different years. An advantage of using panel regression is that it can control for heterogeneity effects that may arise from the correlation of unobserved terms with the independent variables in the model (Baltagi, 2008). The effects are acknowledged as either random (RE) or fixed (FE), and this technique is highly suitable when there is a violation of the homoskedasticity and non-auto correlation assumptions. The difference between the models is while FE assumes the unobserved entity-specific characteristics are correlated with the regressors, RE assumes them to be random and uncorrelated (Torres-Reyna, 2007). To choose between RE or FE, both need to be performed for all regression models and a Hausman-Test is run. If it is significant to reject that the covariance between the IVs and the constants is zero, then the FE model is chosen. Otherwise, the RE model is used (Torres-Reyna, 2007).

Using the variables specified in Table 1, the study draws a total of 6 empirical models as there are two dependent variables investigated separately: ROA and NIM. The baseline regression model to test the first hypothesis (H1a) is as follows:

$$FP_{i,t} = \beta_{i,t}CSR + \beta_{1i,t}Size + \beta_{2i,t}Cap. + \beta_{3i,t}Lev. + \beta_{4i,t}Loan + \beta_{5i,t}GDPperCap. + a_{i,t} + \varepsilon_{i,t} \quad (1)(2)$$

The baseline model shows that bank i 's financial performance (ROA and NIM) as dependent variables (DV) is regressed to its CSR performance, and controls as independent variables (IV) at time t : 2017,2018,2019,2020. To test hypothesis 1b, the previous year's data on CSR is used as a lagged term.

$$FP_{i,t} = \beta_{i,t-1}CSR + \beta_{1i,t}Size + \beta_{2i,t}Cap. + \beta_{3i,t}Lev. + \beta_{4i,t}Loan + \beta_{5i,t}GDPperCap. + a_{i,t} + \varepsilon_{i,t} \quad (3)(4)$$

For the second hypothesis, the moderating effect is studied by introducing an interaction term for the dummy variable *Developed*, to compare whether banks in developed countries would have better FP from CSR than banks in developing countries. The moderator is included in the model as follows:

$$FP_{i,t} = \beta_{i,t}CSR + \beta_{1i,t}Developed + \beta_{2i,t}CSR \cdot Developed + \beta_{3i,t}Size + \beta_{4i,t}Cap. + \beta_{5i,t}Lev. + \beta_{6i,t}Loan + \beta_{7i,t}GDPperCap. + a_{i,t} + \varepsilon_{i,t} \quad (5)(6)$$

In all models, $\alpha_{i,t}$ is the constant, $\varepsilon_{i,t}$ is the error term and β, \dots, β_7 are the regression coefficients. The definition of the variables in all regression models used are shown in Table 1B.

Table 1B. Definition of Variables

Variable	Definition	Source
<i>Performance Variable</i>		
ROA	Net income/Total asset*100	Datastream
Net Interest Margin	Net Interest Income/Total Assets*100	Datastream
<i>Independent Variable</i>		
CSR	ESG rating of each company	Datastream
<i>Controls</i>		
Size	Log (Total Assets)	Datastream
Capital Ratio	Equity/Total assets*100	Datastream
Leverage	Total debt/ Total assets*100	Datastream
Loan Ratio	Total loan/ Total assets*100	Datastream
GDP per capita	Gross Domestic Product divided by population	World Bank
Developed	1 for developed country, 0 for developing country	World Bank

Chapter 4. Data and Results

4.1. Descriptive Statistics

Table 2. Summary statistics

Variables	Obs.	Mean	Std. Deviation	Min	Max
ROA (%)	624	1.18	1.00	-2.47	10.96
NIM (%)	624	2.44	1.65	0.157	17.12
CSR score	624	55.44	20.97	5.37	94.48
Log(Total Assets)	624	7.94	0.67	6.36	9.67
Capital Ratio (%)	624	18.18	8.90	3.28	58.59
Leverage (%)	624	17.29	11.64	0	68.35
Loan Ratio (%)	624	65.23	15.39	1.99	99.27
GDP per capita (USD\$)	624	29179.47	21535.17	1927.708	117098.40

There are 624 observations in total accounting for 156 global bank data over 4 years. The sample is taken at random, after filtering out those without CSR reports for the given period. Among the 624 observations, 424 (67%) are from banks in developed countries. There are likely more banks and banks that report their CSR in the developed region. The global average ROA is 1.18% and NIM is 2.44%, both being slightly lower than the average for US banks, 1.34% and 2.98% (WellsFargo). The CSR score ranges vastly between 5.37 to 94.48 with a mean of 55.44 points, and the discrepancy between the minimum and maximum values is also vast for the capital, debt, and loan ratios. Table 2 also shows there are banks from countries with a per capita economic output as low as \$1,927.708 and as high as \$117,098. Despite these ranges, the standard deviations for all are lower than the means, thus the data are less spread out and clustered to the

means. With 624 observations, it can be said that the sample size is sufficiently large. Then according to the Central Limit Theorem, the means of the sample would be approximately normally distributed.

4.2. Testing for Multicollinearity

When a regression is performed, the goal is to isolate the relationship between the response and explanatory variables. If there is a correlation among the independent variables, it would be difficult to have a precise estimation of the coefficients and hence, the actual effect. This problem of multicollinearity is resolved in the sample used as indicated in the Pearson correlation matrix and variance inflation factor (VIF) test. **Appendix 1** shows that the absolute correlation value between the IVs is all below 0.5, thus there is no strong correlation. The VIF values in **Appendix 2** are all between 1 and 2, where a score of 1 represents no correlation. The mean VIF is 1.76. Given these diagnostics, a regression can be performed.

4.3. Testing for Heteroskedasticity and Autocorrelation

Heteroskedasticity is tested using the Breusch-Pagan or Wald test. The diagnostics test whether the variance among the errors in the models is constant. **Appendix 4** presents a significant $p < 0.01$ result to reject the hypothesis, hence heteroskedasticity is present. Aside from this, autocorrelation is also tested using the Wooldridge test to show if the variables are not independent of themselves. Based on **Appendix 3**, it is found that when regressed to ROA (Models (2),(4),(6)) the model does not suffer from autocorrelation. However, when regressed to NIM (Models (1),(3),(5)), it is significant to reject the hypothesis that there is no autocorrelation. Despite the presence of heteroskedasticity and autocorrelation in certain models, these violations are accounted for when using the FE/RE panel regression technique with robust standard errors (Baltagi, 2008; Torres-Reyna, 2007).

4.4. Results

Table 3. Baseline regression output of models 1 and 2

VARIABLES	(1) NIM	(2) ROA
CSR	0.00633* (0.00328)	0.00697*** (0.00268)
Size	-3.893*** (0.437)	-0.461*** (0.110)
Leverage	-0.0112 (0.00754)	-0.0113** (0.00570)
Capital Ratio	0.0285*** (0.00744)	0.0257*** (0.00674)
Loan Ratio	0.0172*** (0.00464)	-0.00731** (0.00353)

GDP per Cap.	-2.37e-05** (9.52e-06)	-8.26e-06*** (2.92e-06)
Constant	32.09*** (3.439)	4.986*** (0.922)
Observations	624	624
Number of Banks	156	156
R-squared	0.233	0.228
Prob > F	0.000	0.000
Year Fixed Effect	YES	YES

Note. This table provides estimates for regression models 1 and 2. Model 1 uses Net Interest Margin as dependent variable, while Model 2 uses Return on Assets, both measured in percentages. Both models follow the fixed effect panel regression with year fixed effect applied. Robust standard errors are in parentheses and the significance level of the estimates are as follows:*** p<0.01, ** p<0.05, * p<0.1

The baseline regression follows the FE model based on the Hausman-test. When controlling for size, leverage, capital and loan ratios, and GDP per capita, the CSR score has a positive and significant association with FP. The effect is significantly below a level of 10% on NIM and 1% on ROA, and both models are significant at p<0.01. For an increase of 1 point in CSR rating, on average bank NIM increases by 0.00633%, and ROA increases by 0.00697%. Although the results are low, it is worth noting the average ROA and NIM of the sample banks are also low. The R-squared values show that the variation in NIM and ROA are explained respectively, at 23.3% and 22.8% by the model, meaning some observations fit into the model. The overall regression outcome shows there is a positive association between CSR and FP, therefore supporting hypothesis 1a.

Table 4. Panel regression output of models 3 and 4

VARIABLES	(3) NIM	(4) ROA
CSR _{t-1}	0.00880*** (0.00266)	0.000896* (0.00347)
Size	-1.144*** (0.163)	-1.489*** (0.535)
Leverage	-0.0225*** (0.00643)	0.00258 (0.00924)
Capital Ratio	0.0285*** (0.00696)	0.0211** (0.00910)
Loan Ratio	0.0121*** (0.00407)	-0.00377 (0.00570)
GDP per Cap.	-2.47e-05*** (4.51e-06)	-1.46e-05 (1.17e-05)
Constant	10.83*** (1.341)	13.22*** (4.208)
Observations	624	624
Number of Banks	156	156
R-squared	0.451	0.226

Prob > chi 2	0.000	0.000
Random Effect	Yes	Yes

Note. This table provides estimates for regression models 3 and 4. Model 3 uses Net Interest Margin as dependent variable, while Model 4 uses Return on Assets, both measured in percentages. 1-year lagged CSR data is used. Both models follow the random effect panel regression based on the Hausman-test. Robust standard errors are in parentheses and the significance level of the estimates are as follows: *** p<0.01, ** p<0.05, * p<0.1

When the CSR term is lagged by a year, the regression model follows RE because based on the Hausman-test, the hypothesis that the covariance between the IVs and the constants is zero cannot be rejected. With the same control variables, the effect of the previous year's bank CSR on the present year's financial performance is still positive and significant. However, the CSR coefficients are higher and more statistically significant on NIM (at 1% level) compared to model 1. The coefficient is lower and less significant on ROA (at a 10% level) compared to model 2. The results show that on average, a unit increase of CSR rating across time and banks affects NIM by 0.0088% and ROA by 0.000896%. The Chi-tests show that the models are significant below the 5% level and the R-squared value for model 3 is improved from model 1. The variations of FP are explained better by the model, which leads to more reliable results. It is shown from Table 4 that the future financial performance of banks is positively associated with current CSR, hence supporting hypothesis 1b.

Table 5. Panel regression output of models 5 and 6

VARIABLES	(5) NIM	(6) ROA
CSR	0.0185*** (0.00450)	0.0149*** (0.00444)
Developed	-0.931*** (0.336)	-0.411 (0.316)
Developed*CSR	-0.0111** (0.00521)	-0.0101** (0.00502)
Size	-1.208*** (0.152)	-0.522*** (0.103)
Leverage	-0.0204*** (0.00620)	-0.00919* (0.00539)
Capital Ratio	0.0277*** (0.00679)	0.0233*** (0.00644)
Loan Ratio	0.0115*** (0.00391)	-0.00625* (0.00330)
GDP per Capita	-4.80e-06 (5.06e-06)	6.01e-06* (3.48e-06)
Constant	11.26*** (1.286)	5.221*** (0.916)
Observations	624	624
Number of Banks	156	156
R-squared	0.469	0.355
Prob > F	0.000	0.000
Year Fixed Effects	Yes	Yes

Note. This table provides estimates for regression models 5 and 6. Model 5 uses Net Interest

Margin as dependent variable, while Model 6 uses Return on Assets, both measured in percentages. Both models follow the fixed effect panel regression with year fixed effect applied. Robust standard errors are in parentheses and the significance level of the estimates are as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

When the variable Developed is included in the model, the CSR coefficient is higher. As the correlation between CSR and “Developed” is positive and the effect of “Developed” on FP is negative, there is a downward bias from the exclusion of this variable leading to lower CSR coefficients in the previous models. The interaction term is included in models 5 and 6 to investigate the moderating effect of a bank country’s development characteristic on the CSR-FP relationship. The models have R-squared values of 0.469 and 0.355, higher than the former and the models are overall significant under the 5% level. Both, the internal validity, and reliability of the models have increased. The Hausman-test indicated that FE is chosen, and it is a suitable method of analysis because certain characteristics of the banks that are assumed to be time-invariant, such as country development status, may not be correlated with those of other banks.

The coefficients of the interaction terms in the models are negative and significant at 5% level. It represents the difference in the effect between banks in developed and developing countries given a unit change in CSR rating. For instance, when CSR rating increases by 1, the NIM of banks in developing countries on average rises by 0.0185% and 0.0074% for banks in a developed country ($0.0185(1) - 0.0111*(1) *(1)$). The difference, -0.0111 is the interaction term coefficient, which shows that banks in developing countries benefit from higher NIM than banks in the developed country from CSR. This also holds the same for ROA from model 6 due to a coefficient of -0.0101. Therefore, at under 5% significance level, the hypothesis that the CSR-FP relationship is stronger for developed country banks is rejected. Explanation to the rejection of the hypothesis is provided in the following section and also under the conclusion.

4.5. Robustness Test

The robustness of this empirical research is tested by performing a subgroup analysis. Adopting the procedures for the regression models 1 and 2, a fixed effect panel regression analysis is made for two samples: 106 banks in developed and 50 banks in developing economies. As shown in **Appendix 5** and **Appendix 6**, the results are consistent with the rejection of hypothesis **h2**. For banks in developed countries, the coefficients of CSR are negative and only significant at 10% level when regressed to NIM. However, the coefficients are more positive and significant within the sample of developing country banks.

Chapter 5. Conclusion and Discussion

5.1. Overview

In summary, this paper aims to investigate the role of CSR on FP in the global banking sector using accounting measures, return on assets, and net interest margin. The study conducts panel regression from 156 bank data across four periods 2017-2020 from 49 countries. The main finding from the baseline regression model suggests that bank CSR has a positive significant impact on FP, consistent with the evidence from Simpson and Kohers (2002), Scholtens (2009), Platonova et al. (2016), and Mita et al. (2018). Although there is a positive link, the coefficients appear to be small, and this is consistent with previous research. When regressing against ROA, Waddock and Graves (1997) reported a CSR coefficient of 0.024 and Platonova et al. (2016) reported 0.0070.

The results not only confirmed hypotheses **H1a** but also **H1b** because the effect of CSR remains to be positive and significant towards future FP. This finding supports previous research on long-term CSR impact (McGuire et al., 1988; Preston & O' Bannon, 1997, Waddock & Graves, 1997; Platonova et al., 2016). Although this paper confirms the moderating effect of a country's development status, it rejects hypothesis **H2** because it is found that the CSR-FP relationship is less strong in a developed country. This contests Wang et al. (2016) who concluded that companies in developing economies would find it difficult to relay their CSR actions and successfully attract customers. Although Wang et al. (2016) and Ioannou and Serafeim (2012) agreed that governments in many corrupt nations would provide less infrastructure and other basic provisions to their people, this paper found that this issue does not present an obstacle for banks to be profitable from CSR. As part of their CSR activities, banks could take over governmental roles, such as funding the poor, building educational institutions, and supporting infrastructures (Scholtens, 2009; Hu & Scholtens, 2012). Their study found that commercial banks in developing countries are inclined to perform "relatively well on social issues" (Hu & Scholtens, 2012). Such CSR actions could be "conducive to the establishment of a good relationship between the bank and the government" (Waddock & Graves, 1997; Zhou et al., 2021), hence adding value to banks and their trustworthiness. It is instead because of the inadequate attention governments give in the developing economies that banks might be able to make more out of CSR than those in developed regions. Hence, as opposed to Wang et al. (2016), an economy may not need to be developed for banks to fulfil stakeholder needs, securing a stakeholder relationship, and subsequently achieving a positive CSR-FP nexus, such as funding the poor, build educational institutions and supporting infrastructures (Scholtens, 2009; Hu & Scholtens, 2012). Their study found that commercial banks in developing countries are inclined to perform adequately on social problems (Hu & Scholtens, 2012). Such CSR actions could support the bank and the government relationship (Waddock & Graves, 1997; Zhou et al., 2021), hence adding value for banks and their trustworthiness. It is instead because of

the inadequate attention governments give in the developing economies that banks might be able to make more out of CSR than those in developed regions. Hence, as opposed to Wang et al. (2016), an economy may not need to be developed for banks to fulfil stakeholder needs, securing a stakeholder relationship, and subsequently achieving a positive CSR-FP nexus.

To answer the research question, “what effect does corporate social responsibility have on financial performance in the banking industry?” this paper provides evidence that the effect of CSR is significant and positive toward bank FP, and this relationship is contingent on the development status of the bank country. Within the banking sector, this thesis rules out the negative or inconclusive interpretations of the CSR-FP relationship (Soana, 2011; Zhou et al., 2021). This paper conjectures that undertaking CSR would not increase the financial burden, which supports the stakeholder theory of Freeman (1984) and contrasts the view of Friedman (1970) who suggested CSR activities are ought to be handled by the government because it is subversive to the main goal of maximizing profits.

5.2. Research Implications

There are numerous contributions this paper has given socially and practically. As to the current literature in bank CSR-FP, this work has the greatest number of countries (49) in the sample with the most recent CSR information taken. The findings covered in this paper also fill the gap in the literature, which is the lack of empirical CSR-FP research on the global banking industry and the moderating effect of contextual factor in the field. The paper has refined the methodologies by utilising the most appropriate proxies of financial performance and CSR, and a research design that is robust to obtain interpretable results.

Due to the extensive coverage of the research sample, this study is hence more inclusive and representative of the bank population across the world. The results of hypothesis **h1a** corroborate a positive CSR-FP relationship, which implies that banks need to give prominence to their CSR credentials since having an improved overall CSR is found to be related to higher ROA and NIM. Engaging in CSR would help ensure a safe and trusted banking system upon which society can depend on. It is inferred that CSR could also be among the motivational factor to achieve FP in banks. The results for hypothesis **h1b** also implied that CSR is beneficial to banks over time, meaning CSR is a good long-term strategy for bank management to adopt. As mentioned, banks are important for economic development (Shen & Lee, 2006; Ivashina & Scharfstein, 2010). The conclusion for **h2** where the bank CSR-FP relationship is stronger in developing countries denotes the need for banks in these economies to prioritize CSR engagements. Research by EY (2020) found that financial inclusion can improve GDP by 14% in large developing countries. If banks could be consistent with their CSR goals as such, this would help improve living conditions for many families and SMEs while earning their trust as they grow. Increasing prosperity among the stakeholders due to the support of banks would, in turn, allow banks to remain profitable. With all the

possible implications considered, this study concludes that CSR is not a wasteful resource, but an investment that unlocks higher financial performance for banks.

5.3. Limitations and Suggestions for Future Research

As more banks may report CSR information in the coming years, future studies should extend the study period and include more banks to create a sample that is well representative of the global banking industry. Despite having the greatest number of countries (49) compared to the previous studies, banks from Africa, Latin America and Eastern European regions are underrepresented. This may prohibit the results from being generalized. Furthermore, the proportion between banks from the developed and developing economies may not be strongly balanced, hence resulting to sample selection bias.

In terms of methodology, omitted variable bias may arise from model misspecification. Although this paper replicates the control variables featured in the literature, there might be a few which could influence bank operations and profitability, such as a country's money supply, corruption level, the level of banking restrictions, and other policy effects which are difficult to quantify. Further research could investigate the different components of CSR on bank FP to understand which actions impact more, given the variety of sustainable financial innovation, products, and services. Likewise, bank FP could also be deconstructed into growth and risk measures, besides using profitability. Other moderators to the CSR-FP link in banks, such as the role of different stakeholders, as conducted by Wang and Berens (2014) on aggregated industries could be analyzed. This would provide insight for bank managers to decide which stakeholder relationship matters more. decide which stakeholder relationship matters more.

To increase the validity of the empirical research, further studies could consider applying the Two-Stage Least Squares (TSLS) regression as it may account omitted variable bias and simultaneity bias. Simultaneity bias may arise from the possibility in which higher performing firms would have better CSR standards due to having more resources, and this is attributed to the slack resource theory (Waddock & Graves, 1997; Preston & O'Bannon, 1997). Future studies could analyse the applicability of this theory in the banking sector and confirm the existence of simultaneous causality within the CSR-FP relationship. Despite the huge amount of CSR-FP literature in existence, CSR is a topic that continues to become relevant, especially within the banking industry. Due to its growing importance and the changes in trends, there are many valuable directions for further study that are yet to be explored.

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APPENDIX

Appendix 1. Pearson Correlation Matrix

Variables	NIM	ROA	CSR	Log (Assets)	Leverage	Capital Ratio	Loan Ratio	GDPper Capita
NIM	1.000							
ROA	0.747	1.000						
CSR	0.053	0.037	1.000					
Log(Assets)	-0.383	-0.270	0.467	1.000				
Leverage	-0.241	-0.124	0.151	0.256	1.000			
Capital Ratio	0.144	0.191	0.027	-0.176	0.602	1.000		
Loan Ratio	0.176	0.003	-0.149	-0.315	0.0388	0.186	1.000	
GDPperCapita	-0.354	-0.192	0.115	0.0367	0.145	0.027	-0.056	1.000

Appendix 2. VIF table

. vif

Variable	VIF	1/VIF
leverage	2.08	0.481571
capitalratio	2.00	0.499612
gdppercapi~m	1.96	0.511398
develop	1.95	0.513289
logtassets	1.82	0.548596
esgscore	1.34	0.747554
loanratio	1.15	0.870035
Mean VIF	1.76	

Appendix 3. Heteroskedasticity Tests for Models 1-6

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (156) = 2.9e+05
Prob>chi2 = 0.0000

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (156) = 1.3e+06
Prob>chi2 = 0.0000

Breusch and Pagan Lagrangian multiplier test for random effects

$nim[company,t] = Xb + u[company] + e[company,t]$

Estimated results:

	Var	SD = sqrt(Var)
nim	2.734863	1.653742
e	.1455728	.38154
u	1.668903	1.29186

Test: $Var(u) = 0$

chibar2(01) = 763.29
Prob > chibar2 = 0.0000

Breusch and Pagan Lagrangian multiplier test for random effects

$roafixed[company,t] = Xb + u[company] + e[company,t]$

Estimated results:

	Var	SD = sqrt(Var)
roafixed	1.003675	1.001836
e	.2184817	.4674203
u	.5802016	.7617096

Test: $Var(u) = 0$

chibar2(01) = 476.84
Prob > chibar2 = 0.0000

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (156) = 8.3e+05

Prob>chi2 = 0.0000

.

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (156) = 6.7e+05

Prob>chi2 = 0.0000

€

Appendix 4. Autocorrelation Tests for Models 1-6

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    12.412
        Prob > F =    0.0006
```

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    0.487
        Prob > F =    0.4861
```

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    7.969
        Prob > F =    0.0054
```

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    0.470
        Prob > F =    0.4940
```

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    12.283
        Prob > F =    0.0006
```

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,    155) =    0.487
        Prob > F =    0.4861
```

Appendix 5. Regression Estimates of Banks in Developed Countries

VARIABLES	(1) ROA	(2) NIM
CSR	-0.00864 (0.00350)	-0.000257* (0.00152)
Size	0.666 (0.553)	-1.724*** (0.240)
Leverage	-0.00924 (0.00800)	-0.00168 (0.00347)
Capital Ratio	0.00677 (0.00768)	0.00763** (0.00333)
Loan Ratio	-0.00538 (0.00555)	0.0175*** (0.00241)
GDP per Cap.	-4.35e-06 (9.80e-06)	-7.28e-06* (4.25e-06)
Constant	-3.213 (4.346)	14.54*** (1.885)
Observations	424	424
Year Fixed Effects	Yes	Yes
R-squared	0.302	0.462
Prob>F	0.000	0.000
Number of Banks	106	106

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 6. Regression Estimates of Banks in Developing Countries

VARIABLES	(1) ROA	(2) NIM
CSR	0.00759** (0.00722)	0.00841*** (0.00703)
Size	-3.899*** (1.092)	-5.370*** (1.063)
Leverage	0.0559** (0.0258)	-0.0143 (0.0252)
Capital Ratio	0.0661** (0.0271)	0.0825*** (0.0264)
Loan Ratio	0.0109 (0.0127)	0.0202 (0.0124)
GDP per Cap.	-3.20e-05 (4.54e-05)	-0.000115** (4.42e-05)
Constant	30.07*** (8.657)	44.38*** (8.429)
Observations	200	200
Year Fixed Effects	Yes	Yes
R-squared	0.320	0.339
Prob>F	0.000	0.000
Number of Banks	50	50

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1