

THE EFFECT OF FOCUS VERSUS DIVERSIFICATION ON BANK PERFORMANCE:
DOES ETHICAL STRUCTURE MATTER?

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DOES ETHICAL STRUCTURE MATTER?**

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ABSTRACT

THE EFFECT OF FOCUS VERSUS DIVERSIFICATION ON BANK PERFORMANCE: DOES ETHICAL STRUCTURE MATTER?

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Financial institutions pursue a tradeoff model in order to reduce risk and maximize profitability and performance. Ethical practices, like those of any other profit-maximizing firm, must pursue profit. For banks that target sustainable practices, what matters is how they generate profits and whether their practices have harmful social or environmental consequences. The aim of this thesis is to investigate the impact of asset and liability diversification on bank performance by taking into consideration the bank's ethical status, which is measured by the bank's sustainability rating ESG. Fixed Effect Models, Random Effects Models, and Prais-Winsten Regressions are used to test the relationship between diversification and bank performance. The findings of the study suggest that having an asset-focused portfolio impacts a bank's profit performance and riskiness significantly. However, having a higher ESG score and an asset-focused portfolio decreases the impact of asset focus on return on assets and net interest margin. This finding implies that when a bank is rated higher on a compound sustainability measure, it has relatively lower profitability. On the other hand, liability focus has no significant impact on a bank's profitability or riskiness. However, if a bank has a higher ESG score and a liability-focused portfolio then the impact of liability focus on net interest margin and credit

risk is increasing. This finding, in return, implies that the level of diversification on the liability side matters mostly for higher-ESG banks.

Keywords: Ethical Banking, Focus vs Diversification, ESG Score, Bank Performance



ÖZ

ODAKLANMA YA DA ÇEŞİTLENDİRMENİN BANKA PERFORMANSI ÜZERİNDEKİ ETKİSİ: ETİK YAPILANMA ETKİLİ MİDİR?

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Finansal kurumlar, riski azaltmak ve karlılığı ve performansı en üst düzeye çıkarmak için bir ödünleşme modeli izler. Etik uygulamalar, diğer kâr maksimizasyonu yapan firmalarınki gibi, kâr peşinde koşmalıdır. Sürdürülebilir uygulamaları hedefleyen bankalar için önemli olan, nasıl kâr elde ettikleri ve yaptıkları uygulamalarının zararlı sosyal veya çevresel sonuçları olup olmadığıdır. Bu tezin amacı, bankanın sürdürülebilirlik notu olan ESG ile ölçülen bankanın etik durumunu dikkate alarak aktif ve pasif çeşitlendirmesinin banka performansı üzerindeki etkisini araştırmaktır. Sabit Etki Modelleri, Rastgele Etki Modelleri ve Prais-Winsten Regresyonları, çeşitlendirme ve banka performansı arasındaki ilişkiyi test etmek için kullanılmıştır. Çalışmanın bulguları, varlık odaklı bir portföye sahip olmanın bir bankanın kâr performansını ve riskliliğini önemli ölçüde etkilediğini göstermektedir. Ancak, daha yüksek bir ESG puanına ve varlık odaklı bir portföye sahip olmak, varlık odağının varlıkların getirisi ve net faiz marjı üzerindeki etkisini azalmaktadır. Bu bulgu, bir bankanın bileşik sürdürülebilirlik ölçüsünde daha yüksek derecelendirildiği zaman, nispeten daha düşük karlılığa sahip olduğu anlamına gelir. Öte yandan, yükümlülük odağının bir bankanın karlılığı veya riskliliği üzerinde önemli bir etkisi yoktur. Ancak, bir bankanın ESG puanı daha yüksek ve yükümlülük odaklı bir portföyü varsa, bu durumda yükümlülük odağının net faiz marjı ve kredi riski üzerindeki etkisi

artmaktadır. Bu bulgu, yükümlölük tarafındaki çeşitlendirme düzeyinin daha çok ESG puanı yüksek bankalar için önemli olduğunu ima etmektedir.

Anahtar Kelimeler: Etik Bankacılık, Odaklanma ve Çeşitlendirme, ESG Puanlama Sistemi, Banka Performansı



To my beloved family



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LIST OF ABBREVIATIONS

CSR	Corporate Social Responsibility
ESG	Environmental, Social, Governance
EQR	Equity Ratio
GDP	Gross Domestic Product
HHI	Herfindahl-Hirschman Index
NIM	Net Interest Margin
ROA	Return on Asset
ROE	Return on Equity
T1	Tier 1 Adjusted Capital Ratio



CHAPTER 1

INTRODUCTION

Financial institutions need to pursue some model to reduce risk and maximize profitability and performance. Whether banks should focus/diversify across products, regions, assets, or liabilities to do so is a commonly asked and studied question in the banking literature. The results presented in the existing literature are mixed. While some studies find diversification to be risky and costly (e.g. Berger *et al.*, 2008), others claim that benefits that come with diversification outweigh its costs (e.g. Sawada, 2013).

On the other side of the story, there is a trending subject among bank customers as a result of the global crisis. During the 2008 crisis, as a result of a lack of confidence, over-complexity, and inadequate profitability, customers became hesitant to take out loans or deposit money between 2007 and 2010 (Lin et al., 2011). Coupled with the devastating effects of climate change and mounting social problems around the world over the last decade, an increased awareness about and concern for ethical and social issues lead to social finance and social and ethical banking to become important trends among bank customers, especially in the US and Europe.

Ethical banking is concerned with the impact of banking practices on society and the environment. Ethical practices, like those of any other financial institution, must pursue profit. For banks that target sustainable practices, what matters is how they generate profits and whether their practices have harmful social or environmental consequences. The foundation of ethical banking is a set of values and principles. Even though each bank determines its own models and principles for their activities, majority of ethical banks share some common characteristics such as contribution to

the development of society, supporting sustainable development, offering high-quality financial products and services characterized by transparency, and operating policies that take into account their social and environmental impact (Cristina and Alina, 2009).

Over the last two decades, the increasing attention among investors to environmental and social issues while making investment decisions made it necessary to produce information regarding the performance of companies along these dimensions. For this purpose, Thomson Reuters developed a scoring system using environmental, social, and governance (ESG) factors. This database contains data from more than 6,000 public companies across more than 400 countries. ESG Scores aim to measure a company's performance, commitment, and effectiveness across its resource use, emissions, innovation, management, shareholders, CSR strategy, workforce, human rights, community, and product responsibility (Thomson Reuters, 2017).

Although interest in ethical banking has increased since 2008, there are not many studies on the issue in the academic literature. Most of the studies compare ethical banks with mainstream or traditional banks. There is no published study that examines the effects of focus and diversification among ethical banks. The aim of this thesis is to investigate the impact of asset and liability diversification on bank performance by taking into consideration the bank's ethical status, which is measured by its ESG rating. Since banks that aim to maintain a high ESG score may have self-imposed restrictions in the choice of asset investments and liability sources, these banks may be expected to have less diversified, or more focused asset and liability portfolios. Restrictions on the asset side may mean that these banks will not always choose the most profitable investment, but rather investments that are both profitable and generate social value. Similarly, restrictions on the liability side may mean that banks that try to maintain a high ESG score will not always choose the least costly liability source. As such, it is plausible to expect that a bank's ESG standing may affect the relationship that exists between its profit/risk performance and its level of diversification on the two sides of its balance sheet. This thesis aims

to investigate whether the profit-diversification relationship changes when the bank's ESG rating changes.

In order to analyze these relationships, yearly data of 327 publicly held banks from the United States are included in the data set. While ROA, ROE, NIM, and CREDIT RISK ratios are used to measure a bank's profitability and risk, HHI is used to measure the bank's level of diversification on its asset or liability side. In order to examine whether a bank's ESG rating affects the relationship between its diversification level and profit/risk performance, banks with the top twenty-five percentile ESG scores are categorized as high-ESG banks while the rest are categorized as low-ESG banks. Fixed Effect Models, Random Effects Models, and Prais-Winsten Regression are used to test the relationship between diversification and bank performance using various measures.

The findings of the study suggest that having an asset-focused portfolio affects a bank's profit performance and riskiness significantly. However, having a higher ESG score and an asset-focused portfolio decreases the impact of asset focus on return on assets and net interest margin. This finding implies that when a bank is rated higher on a compound sustainability measure, it has relatively lower profitability. On the other hand, liability focus has no significant impact on a bank's profitability or riskiness. However, if a bank has a higher ESG score and a liability-focused portfolio then the impact of liability focus on net interest margin and credit risk is increasing. This finding, in return, implies that the level of diversification on the liability side matters mostly for higher-ESG banks.

The structure of the thesis is as follows: In Chapter 2, a detailed literature review is presented. In Chapter 3, the research methodology is explained. In Chapter 4, information about the data is given along with the descriptive statistics. In Chapter 5, empirical results are discussed. Finally, Chapter 6 provides a brief conclusion.

CHAPTER 2

LITERATURE REVIEW

In the early years of the 21st century, a financial crisis started in the United States and affected the world. Thousands of people lost their jobs, savings, and homes. As stated in the U.S. Bureau of Labor Statistics report (2012), the unemployment rate peaked at 10% which was the highest rate since 1983. The effects of the crisis are still felt today and the global recovery is expected to take years. According to Scheire and De Maertelaere (2009), during the crisis, the financial sector has found itself in another crisis that includes lack of confidence, inadequate profitability, and over-complexity. Although Chang, Jang, Li, and Kim (2017) conclude that the banking industry faces a competitive environment that requires banks to ensure customer satisfaction with the quality of service offered, during the period between 2007 and 2010 customers became hesitant to take out loans or deposit money (Lin, Huang, Batmunkh, Tsendsurena and Batchuluuna, 2011). Coupled with the devastating effects of climate change and mounting social problems around the world over the last decades, an increased awareness about and concern for ethical and social issues lead to, social banking and social finance to become important trends among bank customers in the US and Europe (Goyal and Joshi, 2011; Benedikter, 2011; Karl, 2015; Callejas-Albiñana, Martínez-Rodríguez and de Vidades-Carrasco, 2017). An increasing number of bank customers found social banking as a possible escape from the financial crisis (Weber and Remer, 2011). Especially in Europe, ethical banks have almost doubled their assets between 2007 and 2010 and grown by more than 20% per year, due to their increased popularity with small depositors (Benedikter, 2011). Cristina and Alina (2009) state the main reasons behind the increasing focus on ethical banks as follows:

- ☐ Minimum investment in financial derivatives.

- No listing of ethical banks on a regulated market.
- No participation in operations on the interbank market. Consequently, ethical banks cannot be negatively affected by the contagion effect.
- Transparency in granting loans, by notifying the depositors about the opportunity of the investment.

Formally, ethical banking first emerged with the founding of the first ethical bank, Triodos Bank, in 1971 (Callejas-Albiñana et al., 2017). Banks like Triodos Bank or Charity Bank have dedicated themselves to special sectors such as the environmental organizations or the voluntary sector (Buttle, 2006). Although a uniform definition of alternative or ethical banking does not exist, there are two commonly accepted properties that define ethical banking (Cowton and Thompson, 1999; Buttle, 2006):

1. Obtaining social profitability from funding financial activities with social added value
2. Obtaining economic profitability from a decent management system

It is also argued that ethical banking must be centered on both social and economic commitments. Years later, San-Jose, Retolaza, and Gutierrez-Goiria (2011) added a third property: the existence of an ethical code for an institution to be known as an ethical bank. Likewise, Cowton (2002) defines three principles for ethical banking. The first one is integrity. He defines integrity as the responsibility for not excluding any kind of organization from the financing system, either because of their financial status, geographic situation, or ethnicity. The second is responsibility, i.e. the accountability of the banks for their behavior. The last principle is affinity. Cowton defines affinity as the responsibility for decisions regarding the usage of deposited funds. In a related study, Goyal and Joshi (2011) defined ethical banking as the modest and the best way to deal with money and argued that it is a necessity for banks to get a competitive advantage. In addition, Cristina and Alina (2009) defined it as banking that aims for sustainable banking activities and offers services with a positive influence on society and the environment. For Barbu and Boitan (2009), an ethical bank's mission should be obtaining value and gain by choosing ethical

projects that influence the environment and society. The aim of ethical banking goes beyond the economic benefits and includes the social ones (San-Jose, Retolaza, and Gutierrez, 2009). According to San-Jose et. al, ethical banks should operate with ethical values. Further, Buttle (2006) proposed two ways for banks to be considered as ethical. First, ethical banks should seek to have clear norms and values special to their loan-making process. Second, they should balance care for others with a responsibility to remain sustainable in their decision-making processes.

Summarizing these definitions and values, Cristina and Alina (2009) specify the missions of ethical banks as follows:

1. Contribute to the development of a society
2. Support sustainable development and solidarity
3. Offer viable, high-quality financial products and services, characterized by transparency
4. Operate on a strict investment policy that takes into account the social impact of the project to be financed.

In addition, Climent (2018) defines the principles that a project should provide in order to be financed by an ethical bank as follows:

1. Equality: Project owners should involve the active participation of all members of the organization
2. Employability: Project owners should encourage stable employment
3. Environment: Projects should ensure growth
4. Cooperation: Project owners should encourage internal and external cooperation
5. Commitment to the environment: Project owners should support activities to help the local community.

6. Reinvestment: Project owners should reinvest some portion of their profits in the improvement of the society.

Although the attention and interest in ethical banking among investors and bank customers increased after the global financial crisis of 2008, the academic literature on the subject is quite narrow. According to Karl (2015), a few of these academic studies compare ethical banks with mainstream banks. In fact, most of the studies on ethical and social banking analyze only ethical banks (e.g. Cowton and Thompson, 2000; Buttle, 2006; Chew, Tan, and Hamid, 2015). Unlike the other studies, Cristina and Alina (2009), explained the differences between traditional banking and ethical banking as follows:

- ☐ While ethical banks operate with a set of ethical values that are accepted and respected at all hierarchical levels, traditional banks' activities are mainly aimed at increasing market share and profitability.
- ☐ While ethical banks pursue obtaining social gains besides financial gain, traditional banks' goal is maximizing the financial gain.
- ☐ While ethical banks' investment decisions belong to customers, traditional banks' investment strategy and risk profile are decided by the bank's management.
- ☐ While traditional banks do not provide information about the destinations of their investments and borrowed funds, ethical banks publish that information on a regular basis.
- ☐ While traditional banks do not take into account the applicant's motivation while financing, ethical banks' most important concern is whether the financed project has a positive influence on society and the environment.

Further, Benedikter (2011) states that the main difference between ethical banks and mainstream banks is that while mainstream banks focus mostly on profit maximization, ethical banks adopt the principle of 'profit-people-planet'. From an ethical bank's point of view, supporting the well-being of the society and environment is equally important as making a profit. Benedikter argues that in order

to pursue these multiple goals, ethical banks must be small and flexible enough to make decisions quickly and without pressure. In fact, that is why ethical banks refuse to become publicly tradable. Climent (2018) summarizes the differences between conventional banks and ethical banks in the literature and states them as follows:

□ Whereas conventional banks focus on purely financial gain, ethical banks pursue both financial and social gains. That is why commercial banks try to maximize profits while ethical banks try to maximize the volume of projects that have ethical purposes. Also, that is why it is not surprising for ethical banks to have lower profits. In fact, Climent's study offers three reasons for possibly lower profits that will be earned by ethical banks:

1. Profit that comes from their investments have social and environmental costs.
2. Ethical banks generally make long-term investments. Hence, the return is not obtained instantly.
3. Since the amount of the loan is generally small, the profit margin is narrow.

□ While conventional banks' investment criterion is maximizing returns, ethical banks finance projects and companies that will influence society positively.

□ While conventional banks' criteria for granting loans are only financial, ethical banks evaluate projects from an ethical point of view.

□ In conventional banks, one share equals one vote whereas in ethical banks one shareholder is equal to one vote, regardless of how many shares he/she holds.

□ In conventional banks, customers do not have any control over how their funds are used while customers decide how their funds are used in ethical banks.

Unlike the comparison of ethical banking and traditional banking, the relationship between corporate social responsibility and financial performance has long been a subject of study (e.g. Orlitzky, Schmidt and Rynes, 2003; Soana, 2009; Surroca, Tribo and Waddock, 2010; San-Jose, Retolaza, and Lamarque, 2018). While Soana (2009), Surroca et al. (2010), and San-Jose et al. (2018) show no direct relationship

between corporate social responsibility and financial performance, Orlitzky et al. (2003) provide evidence that corporate social performance is positively correlated with corporate financial performance and the relationship tends to be simultaneous.

Although ethical banking is an increasing trend all over the world, Europe can be seen as the heart of it. According to Callejas-Albiñana et al. (2017), ethical banks in Europe are at the center of the continent's largest economies with their high growth potential. The Global Alliance for Banking on Values (GABV), founded in 2009, gathers most of these banks under a single roof with the mission of changing the banking system to a more transparent, supportive, and socially and environmentally sustainable one (Global Alliance for Banking on Values, 2019). With a similar purpose, Thomson Reuters developed a scoring system using environmental, social, and governance (ESG) factors. Thomson Reuters ESG Scores are designed to measure a company's performance, commitment, and effectiveness across its resource use, emissions, innovation, management, shareholders, CSR strategy, workforce, human rights, community, and product responsibility. With more than 6,000 companies all over the world, Thomson Reuters makes it possible for investors to take environmental, social and governance factors into account while they are making their investment decisions (Thomson Reuters, 2017).

On the other side of the story, whether banks should focus on specific products and regions, or diversify their asset and liabilities sides is a commonly studied question in the banking literature. So far, studies that focus on focus versus diversification give no consensus results (e.g. Abuzayed, Al-Fayoumi, and Molyneux, 2018). There is evidence supporting both focus and diversification (Berger, Hasan, and Zhou, 2008). Advocates of diversified banks claim that geographically diversified banks may obtain tax benefits, and also benefit from leveraging abilities across different regions and products (Iskandar-Datta and McLaughlin, 2005). Consistent with these arguments, Berger et al. (2008), conclude that diversified banks will be more desirable for customers who demand multiple products. Further, Boot and Schmeits (2000) claim that diversification will decrease the risk of financial distress and bankruptcy. Likewise, Sawada (2013) also reports the positive impact of

diversification. He claims that the benefit that comes from revenue diversification outweighs the costs. In a similar line of argument, Sharma and Anand (2018) and Shim (2019) conclude that there is a positive relationship between diversification and performance measured in terms of bank risk and returns for medium and large-size banks and that increased loan diversification has a positive impact on the bank's financial strength.

On the other hand, some studies argue that diversification is risky and costly. Klein and Saidenberg (1997) claim that diversification can lead to organizational inefficiency. Further, increasing exchange rates, dealing with different languages, cultures, laws, and customs are shown as the disadvantages associated with global diversification (Berger et al., 2008)

A tabulated version of the literature review can be found in Appendix A.



CHAPTER 3

RESEARCH METHODOLOGY

3.1 Description of the Variables

As mentioned in the introduction, this study aims to understand the impact of asset and liability diversification on bank performance while considering the bank's ethical status as measured by its ESG rating. The empirical analysis includes the variables below.

3.1.1 Profitability and Risk Measures

Following Acharya et al. (2002) and Cotugno and Stefanelli (2012), Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin(NIM) are used to measure a bank's profitability. In addition, following Berger et al.'s study (2010), CREDIT RISK ratio is used as the measure of a bank's riskiness. The definitions of these variables are provided below:

NIM: $(\text{Interest Income} - \text{Interest Expense}) / \text{Earning Assets}$

CREDIT RISK: $\text{Net Non-Performing Loans} / \text{Net Loans}$

ROA: $\text{Net Income} / \text{Total Assets}$

ROE: $\text{Net Income} / \text{Total Equity}$

3.1.2 Diversification Measures

In line with the previous studies (e.g. Acharya et al., 2006; Tabak et al., 2011) while HHI ASSET is a proxy for asset-side diversification, HHI LIABILITY is a measure for liability-side diversification. HHI indexes are calculated as follows:

$$\begin{aligned}
\text{HHI ASSET} &= \left(\frac{\text{Cash and Due from Banks}}{\text{Total Assets}} \right)^2 + \left(\frac{\text{Other Earning Assets}}{\text{Total Assets}} \right)^2 \\
&\quad + \left(\frac{\text{Net Loans}}{\text{Total Assets}} \right)^2 + \left(\frac{\text{Property, Plant and Equipment}}{\text{Total Assets}} \right)^2 \\
&\quad + \left(\frac{\text{Other Assets}}{\text{Total Assets}} \right)^2 \\
\text{HHI LIABILITY} &= \left(\frac{\text{Total Deposits}}{\text{Total Liabilities}} \right)^2 + \left(\frac{\text{Total Long-Term Debt}}{\text{Total Liabilities}} \right)^2 \\
&\quad + \left(\frac{\text{Total Short-Term Borrowings} + \text{Other Bearing Liabilities}}{\text{Total Liabilities}} \right)^2 \\
&\quad + \left(\frac{\text{Other Liabilities}}{\text{Total Liabilities}} \right)^2
\end{aligned}$$

While the upper limit for these measures is 1, indicating a single type of asset or liability, the lower limit is $1/n$ that refers to a diversified portfolio with the degree of diversification increasing as the ratio gets smaller.

3.1.3 Control Variables

Following Acharya et al. (2006) and (Chen et al. (2014), the following control variables are used:

Bank size: Natural logarithm of total assets

Financial health of the bank: Tier 1 adjusted capital ratio

Capital structure of the bank: Total Equity / Total Assets

Effect of the macroeconomic environment: Level of the gross domestic product

3.1.4 Ethical Status

3.1.4.1 Thomson Reuters ESG Scoring System

According to Thomson Reuters (2017), the three main categories of the overall ESG score are Environmental, Social, and Governance. The subcategories of these three dimensions along with their counts and weights can be seen in Table 3.1

Table 3.1 Subcategories of the ESG Score			
Pillar	Category	Indicators in Scoring	Weights
Environmental	Resource Use	20	11%
	Emissions	22	12%
	Innovation	19	11%
Social	Workforce	29	16%
	Human Rights	8	4.50%
	Community	14	8%
	Product Responsibility	12	7%
Governance	Management	34	19%
	Shareholders	12	7%
	CSR Strategy	8	4.50%
TOTAL		178	100%

Source: Thomson Reuters, 2017

Thomson Reuters collects data and calculates the selected subset of the most relevant 178 ESG indicators that are grouped into 10 categories. The ESG Score structure is provided in Figure 3.1 below.

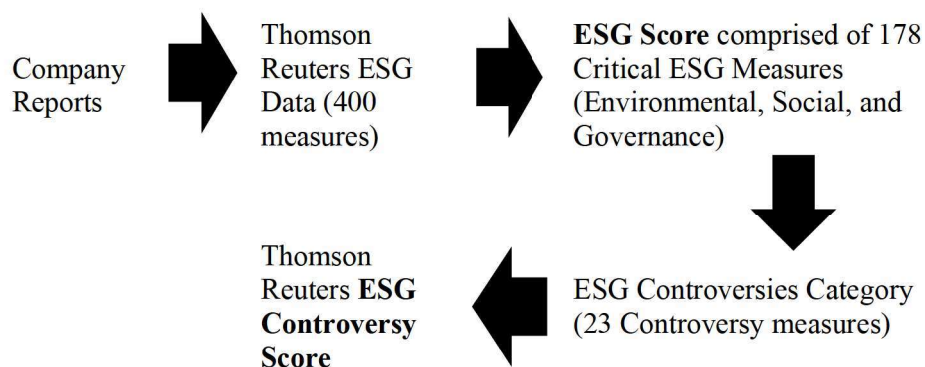


Figure 3.1: ESG score structure. Source: Thomson Reuters, 2017)

3.1.4.2 Variables Related to the ESG Score

In order to examine the role of a bank's ethical status on the relationship between diversification and performance, a dummy variable is created based on the bank's ESG score. Banks with an ESG score in the top twenty-five percentile of the sample banks are categorized as high-ESG banks while the rest are categorized as low-ESG banks. For the top twenty-five percentile banks, the ESG dummy is equal to 1 while for the rest of the banks it is equal to 0. Also, in order to examine the interaction between asset diversification and ethical status, and similarly for liability diversification and ethical status, additional dummy variables are used. The definition for the dummy variables are presented below:

ESG DUMMY: Equals to 1 if the bank's ESG score is in the top twenty-five percentile, 0 otherwise

ESG x ASSET DUMMY: $\text{ESG DUMMY} \times \text{HHI ASSET}$

ESG x LIABILITY DUMMY: $\text{ESG DUMMY} \times \text{HHI LIABILITY}$

3.2 Panel Data Analysis

A dataset consisting of a combination of cross-sectional data over time is called panel data (or cross-sectional time-series data). In other words, it is a dataset where the behavior of the entities is observed repeatedly across time. The statistical analysis technique to analyze such data is called the panel data analysis.

There are three main approaches of panel data models, which are the Pooled Ordinary Least Squares Model, Fixed Effects Model, and Random Effects Models. The general form of the panel data regression equation is as follows:

$$Y_{it} = \alpha_{it} + \beta_{it}X_{it} + \varepsilon_{it}$$

In panel data analysis, Y is the dependent variable, X is the independent variable, α is the constant parameter, β is the slope parameter, and lastly, ε is the error term.

3.3 Model Specifications

Since the data collected for the study includes observations on banks over time, a panel data analysis is performed using STATA. In order to find the best approach to analyze the data, the Hausman Test, Breusch-Pagan Lagrange multiplier test, test for heteroskedasticity, and serial correlation tests have been applied. Based on the results of these tests, Fixed Effect Models (FEM) and Random Effects Models (REM) are used to test the relationship between diversification and bank performance while controlling for the ESG ratings of banks. When the panel structure is exposed to autocorrelation, FEM and REM have been criticized for biased results. That is why for the model specifications that have autocorrelation, the Prais-Winsten regression has been employed.

In regression analysis, Y is denoted as one of the performance variables and the vector X is the set of control variables.

The analyses are conducted for the following cases:

Case 1: ESG Score vs Asset and Liability Diversification

Dependent variable: HHI ASSET or HHI LIABILITY

Independent variable: ESG Score

The models used for Case 1 are presented below:

$$HHI\ ASSET_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 ESG\ SCORE_{it-1} + \varepsilon_{it}$$

$$HHI\ LIABILITY = \alpha_1 + \beta_3 X_{it-1} + \beta_4 ESG\ SCORE_{it-1} + \varepsilon_{it}$$

Case 2: Diversification vs Bank Performance with ESG Score

In these models, the raw ESG score is included in the model as an indicator of the bank's ethical status.

Case 2.1: Asset and Liability Diversification and Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI ASSET, HHI LIABILITY, and ESG Score

The models used for Case 2.1 are as follows:

$$Y_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ ASSET_{it-1} + \beta_3 HHI\ LIABILITY_{it-1} + \beta_4 ESG\ SCORE_{it-1} + \varepsilon_{it}$$

Case 2.2: Asset Diversification vs Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI Asset and ESG Score

The models used for Case 2.2 are as follows:

$$Y_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ ASSET_{it-1} + \beta_3 ESG\ SCORE_{it-1} + \varepsilon_{it}$$

Case 2.3: Liability Diversification vs Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI Liability and ESG Score

The models used for Case 2.3 are as follows:

$$Y_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ LIABILITY_{it-1} + \beta_3 ESG\ SCORE_{it-1} + \varepsilon_{it}$$

Case 3: Diversification vs Bank Performance with Dummy and Interaction Variables

In these models, the ESG Dummy and the interaction dummies ESG x HHI Asset and ESG x HHI Liability are included in order to account for the ethical status of the banks.

Case 3.1: Asset and Liability Diversification vs Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI ASSET, HHI LIABILITY, ESG DUMMY, ESG DUMMY × HHI ASSET, and ESG DUMMY × HHI LIABILITY

The models used for Case 3.1 are as follows:

$$\begin{aligned} Y_{it} = & \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ ASSET_{it-1} + \beta_3 HHI\ LIABILITY_{it-1} \\ & + \beta_4 ESG \times ASSET\ DUMMY_{it-1} \\ & + \beta_5 ESG \times LIABILITY\ DUMMY_{it-1} + \beta_6 ESG\ DUMMY_{it-1} \\ & + \varepsilon_{it} \end{aligned}$$

Case 3.2: Asset Diversification vs Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI ASSET, ESG DUMMY, ESG DUMMY × HHI ASSET

The models used for Case 3.2 are as follows:

$$Y_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ ASSET_{it-1} + \beta_3 ESG \times ASSET\ DUMMY_{it-1} + \beta_4 ESG\ DUMMY_{it-1} + \varepsilon_{it}$$

Case 3.3: Liability Diversification vs Bank Performance

Dependent variable: ROA, or ROE, or NIM, or CREDIT RISK

Independent variables: HHI LIABILITY, ESG DUMMY, ESG DUMMY $\times$ HHI LIABILITY

The models used for Case 3.3 are as follows:

$$Y_{it} = \alpha_0 + \beta_1 X_{it-1} + \beta_2 HHI\ LIABILITY_{it-1} + \beta_3 ESG \times LIABILITY\ DUMMY_{it-1} + \beta_4 ESG\ DUMMY_{it-1} + \varepsilon_{it}$$

CHAPTER 4

DATA AND DESCRIPTIVE STATISTICS

The data are collected from Thomson Reuters/EIKON and forms an unbalanced panel. The period of the study ranges from 2002 to 2020 and data are on an annual basis. The sample consists of 371 publicly traded banks from the United States.

Table 4.1 provides the descriptive statistics for all banks. The mean for the asset diversification measure is 0.533 while the mean for liability diversification is 0.761, implying that the sample banks are diversified moderately both on the asset and the liability sides. The mean net interest margin is 3.67%, mean ROA is 0.82% and mean ROE is 7.79% while the mean for Credit Risk is 1.6%.

Table 4.1 Descriptive Statistics

Variables	Num. of Obs.	Mean	Std. Dev.	Min	Max
ROA	5,841	0.00824	0.00834	-0.08470	0.06950
ROE	5,832	0.07790	0.10200	-1.30300	0.96900
NIM	5,768	0.03670	0.04020	0.00716	1.52500
Credit Risk	4,038	0.01590	0.01860	0.00007	0.19300
HHI Asset	5,841	0.53300	0.11100	0.00004	0.95800
HHI Liability	5,841	0.76100	0.14800	0.00007	0.99800
Size (Log TA)	5,841	21.60000	1.63400	17.52000	28.88000
Tier 1 Ratio	5,421	13.53000	4.44100	4.00000	57.21000
Equity Ratio	5,828	0.10800	0.04440	0.00417	0.75900
ESG Score	1,834	34.34000	13.90000	1.90400	88.38000
ESG x Asset	5,841	0.37100	0.25900	0.00000	0.95800
ESG x Liability	5,841	0.53000	0.36700	0.00000	0.99800

The correlation matrix of the explanatory variables is provided in Table 4.2. Profitability measures ROA and ROE are positively and significantly correlated with a coefficient of 0.922. Similarly the correlations between ROA and NIM as well as ROE and NIM are positive and significant. As expected, as the credit risk increases, bank profitability, no matter how it is measured, decreases. Since the loan portfolio is the most important source of risk on the asset side of the bank, an increase in credit risk implying a higher potential for losses in the loan portfolio affects the bank's profitability in a negative manner.



Table 4.2 Correlation Matrix

	NIM	Credit Risk	ROA	ROE	Size	Tier 1 Ratio	Equity Ratio	HHI Liability	HHI Asset	ESG Score	ESG Dummy	ESG x Asset	ESG x Liability
NIM	1.000												
Credit Risk	-0.096	1.000											
ROA	0.347	-0.278	1.000										
ROE	0.263	-0.280	0.922	1.000									
Size	-0.115	0.274	0.001	0.025	1.000								
Tier 1 Ratio	-0.066	0.157	0.012	-0.121	-0.259	1.000							
Equity Ratio	0.122	-0.002	0.093	-0.226	-0.053	0.470	1.000						
HHI Liability	0.180	-0.203	0.079	-0.004	-0.622	0.091	0.143	1.000					
HHI Asset	0.090	-0.223	-0.023	-0.025	-0.466	-0.035	0.001	0.321	1.000				
ESG Score	-0.075	0.152	0.030	0.040	0.626	-0.197	-0.075	0.352	0.324	1.000			
ESG Dummy	0.133	0.213	-0.032	-0.009	0.551	-0.090	-0.099	-0.361	-0.334	0.659	1.000		
ESG x Asset	-0.124	0.188	-0.020	0.003	0.518	-0.094	-0.093	-0.315	-0.303	0.644	0.986	1.000	
ESG x Liability	-0.111	0.170	-0.003	0.011	0.467	-0.084	-0.070	-0.247	-0.272	0.614	0.945	0.978	1.000

The average values of asset and liability diversification measures over the period 2002 to 2020 are also calculated in order to observe the change of these measures over time. The time series graphs are presented in Figure 4.1. Right before the 2008 crisis, it is possible to observe a decrease in asset diversification, in line with most US banks holding high concentrations of mortgage loans leading up to 2008. After the crisis, asset diversification increases and liability diversification decreases. This is in line with the US banks diversifying their asset holdings with an attempt to alleviate the detrimental effects of the mortgage loan defaults.

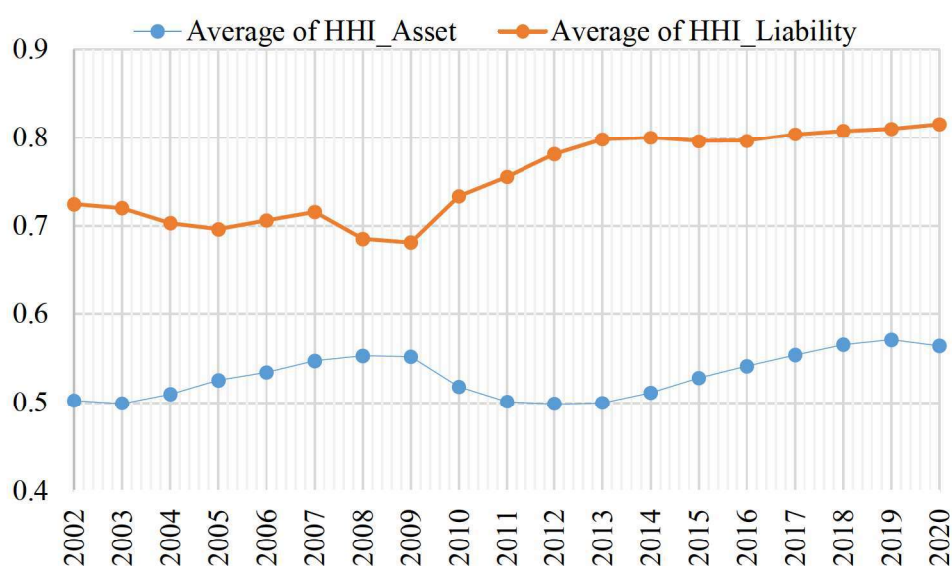


Figure 4.1: Average values of the diversification measures between 2002 and 2020

Table 4.3: Average values of diversification measures between 2017 and 2020

	2017			2018			2019			2020		
	HHI ASSET	HHI LIABILITY		HHI ASSET	HHI LIABILITY		HHI ASSET	HHI LIABILITY		HHI ASSET	HHI LIABILITY	
1	0.52	0.75		0.52	0.76		0.53	0.77		0.54	0.78	
2	0.55	0.80		0.57	0.79		0.57	0.82		0.57	0.83	
3	0.55	0.81		0.56	0.82		0.56	0.82		0.56	0.82	
4	0.57	0.82		0.58	0.84		0.60	0.83		0.58	0.84	

Table 4.3 shows the average value of diversification measures over the last four years in the sample. In order to examine the variation of diversification measures according to the ethical status of banks, ESG scores were divided into four parts, 1 represents the bottom 25 percentile and 4 represents the top 25 percentile. Table 4.3 suggests that, as suspected, banks with higher ESG scores are more asset and liability-focused. According to Karl (2015), this is because of the fact that high-ESG banks need to be selective in the loans they give or the deposits they collect.



CHAPTER 5

EMPIRICAL RESULTS

5.1 Case 1: ESG Score vs Diversification

For this case, the ESG score is taken as a dependent variable while HHI ASSET and HHI LIABILITY are independent variables along with bank- and market-related control variables. Since there is autocorrelation in both specifications, a Prais-Winsten regression is employed. The results of the Hausman test, test for heteroskedasticity, and serial correlation tests can be seen in Table 5.1.

Table 5.1: P Values of the Model Specification Tests for Case 1

	HHI ASSET	HHI LIABILITY
Hausman Test	0.0000	0.0000
Test for Heteroskedasticity	0.0000	0.0000
Serial Correlation Test	0.0000	0.0000

Table 5.2 shows the results of regression analysis. As expected, ESG Score and diversification indexes are positively correlated implying that banks with higher ESG scores have more focused, or less diversified, asset and liability portfolios.

Table 5.2: - Regression results - ESG Score vs Diversification Indexes

	HHI ASSET	HHI LIABILITY
ESG Score	0.0006 (0.0000)***	0.0011 (0.0000)***
Size	-0.0105 (0.0001)***	-0.0355 (0.0000)***
Tier 1 Ratio	-0.0032 (0.0000)***	-0.0010 (0.216)
Equity Ratio	-0.2666 (0.0000)***	1.0789 (0.0000)***
GDP	0.0000 (0.1485)	0.0000 (0.0000)***
Cons	0.8501 (0.0000)***	1.4452 (0.0000)***
Num. of Obs.	1,719	1,719
R-squared	0.16	0.34

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

5.2 Case 2: Diversification vs Bank Performance with ESG Score

As mentioned before, this thesis aims to investigate the impact of asset and liability diversification on bank performance by taking into consideration its ethical status as measured by the bank's ESG score. The following analyses examine this relationship within different model setups.

5.2.1 Case 2.1 Asset and Liability Diversification vs Bank Performance

In Case 2.1, ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables while HHI ASSET and HHI LIABILITY are independent variables along with bank- and market-related control variables. The results of the Hausman test, test for heteroskedasticity, and serial correlation tests can be seen in Table 5.3.

Table 5.3: P Values of the Model Specification Tests for Case 2.1

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0000	0.0000	0.0000	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0025	0.0630	0.0000	0.0000

Since there is autocorrelation in model specifications with dependent variables ROA, NIM, and CREDIT RISK, the Prais-Winsten regression is employed for these models. For the ROE model, the Hausman test suggests using a Fixed Effects Model. Since there is heteroskedasticity, a Fixed Effects Model with Robust Errors has been employed. Results are presented in Table 5.4.

Asset focus has a significant impact on ROE, NIM, and CREDIT RISK of the bank. The relation is positively correlated except with CREDIT RISK. That implies ROE and NIM are higher when the bank is more asset-focused while CREDIT RISK is higher when the bank is less asset-focused. On the other hand, the liability focus has no significant impact on bank performance and riskiness. Similarly, when the bank's ethical concerns are measured by its raw ESG score, there is no evidence of a significant impact of the ESG score on any of the dependent variables. This initial result implies that having a higher or lower ESG score has no effect on a bank's profitability or credit risk.

Table 5.4: Regression results - Asset and Liability Diversification vs Bank Performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten Regression	FEM with Robust Errors	Prais-Winsten Regression	Prais-Winsten Regression
Size	0.0000 (0.9341)	-0.0314 (0.0001)***	-0.0005 (0.1495)	0.0026 (0.0000)***
Tier 1 Ratio	0.0001 (0.373)	-0.0034 (0.0039)***	0.0002 (0.3557)	0.0015 (0.0000)***
Equity Ratio	-0.0017 (0.8958)	0.1133 (0.5697)	-0.0054 (0.8283)	-0.0981 (0.0006)***
HHI LIABILITY	0.0016 (0.4056)	-0.0556 (0.1783)	0.0066 (0.2191)	0.0052 (0.1273)
HHI ASSET	-0.0007 (0.7746)	0.0973 (0.0642)*	0.0283 (0.0423)**	-0.0097 (0.0564)*
GDP	0.0000 (0.0000)***	0.0000 (0.0000)***	0.0000 (0.4602)	0.0000 (0.0018)***
ESG Score	0.0000 (0.5656)	0.0003 (0.3049)	0.0001 (0.2386)	0.0000 (0.238)
Cons	0.0075 (0.2956)	0.8206 (0.0000)***	0.0225 (0.1023)	-0.0518 (0.0004)***
Num. of Obs.	1,719	1,719	1,719	1,676
R-squared	0.40	0.09	0.60	0.35

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

5.2.2 Case 2.2 Asset Diversification vs Bank Performance

For Case 2.2, as before, ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables while HHI ASSET is the independent variable along with bank- and market-related control variables. Table 5.5 shows the results of the Hausman test,

test for heteroskedasticity, and serial correlation tests. Similar to Case 2.1, since there is autocorrelation in model specifications with the dependent variables ROA, NIM, and CREDIT RISK, a Prais-Winsten regression is employed. For the ROE model, the Hausman test suggests a Fixed Effects Model. Since there is heteroskedasticity, a Fixed Effects Model with Robust Errors has been employed.

Table 5.5: P Values of the Model Specification Tests for Case 2.2

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0002	0.0000	0.0002	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0025	0.0632	0.0000	0.0000

Table 5.6 shows the results of the regression analysis for this case. In line with Case 2.1, results indicate that although asset diversification has a significant impact on a bank's profitability (except when it is measured with ROA) and credit risk, the raw ESG score has no significant impact on any of the performance measures. Results indicate that while having an asset-focused portfolio increases a bank's ROE and NIM, it decreases the bank's CREDIT RISK. On the other hand, having a higher ESG score has no additional impact on a bank's performance.

Table 5.6: Regression results - Asset Diversification vs Bank Performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten Regression	FEM with Robust Errors	Prais-Winsten Regression	Prais-Winsten Regression
Size	0.0000 (0.8161)	-0.0318 (0.0001)***	-0.0007 (0.0687)*	0.0023 (0.0000)***
Tier 1 Ratio	0.0001 (0.3738)	-0.0034 (0.0045)***	0.0001 (0.6062)	0.0015 (0.0000)***
Equity Ratio	-0.0008 (0.9495)	0.0551 (0.7600)	0.004 (0.8673)	-0.092 (0.0013)***
HHI ASSET	-0.0002 (0.9471)	0.0877 (0.0848)*	0.0294 (0.0404)**	-0.0089 (0.0805)*
GDP	0.0000 (0.0000)***	0.0000 (0.0000)***	0.0000 (0.3477)	0.0000 (0.0011)***
ESG Score	0.0000 (0.4634)	0.0002 (0.4272)	0.0001 (0.2222)	0.0000 (0.2563)
Cons	0.0097 (0.0742)*	0.8027 (0.0000)***	0.0324 (0.0001)***	-0.0421 (0.0025)***
Num. of Obs.	1,719	1,719	1,719	1,676
R-squared	0.40	0.09	0.60	0.35

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

5.2.3 Case 2.3 Liability Diversification vs Bank Performance

For Case 2.3, ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables while HHI LIABILITY is the independent variable along with bank- and market-related control variables. Table 5.7 provides the results of the Hausman test, test for heteroskedasticity and serial correlation tests. Like Cases 2.1 and 2.2, a Prais-Winsten regression is employed for model specifications that have autocorrelation,

which are ROA, NIM, and CREDIT RISK. For the ROE model, a Fixed Effects Model with Robust Errors has been employed.

Table 5.7: P Values of the Model Specification Tests for Case 2.3

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0000	0.0000	0.0002	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0025	0.0635	0.0000	0.0000

Table 5.8: Regression results - Liability Diversification vs Bank Performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten Regression	FEM with Robust Errors	Prais-Winsten Regression	Prais-Winsten Regression
Size	0.0000 (0.8554)	-0.0306 (0.0001)***	-0.0014 (0.0365)**	0.0028 (0.0000)***
Tier 1 Ratio	0.0001 (0.3283)	-0.0036 (0.0026)***	-0.0001 (0.6575)	0.0016 (0.0000)***
Equity Ratio	-0.0017 (0.8910)	0.0727 (0.7120)	0.0012 (0.9613)	-0.1025 (0.0003)***
HHI LIABILITY	0.0016 (0.4203)	-0.0496 (0.2199)	0.0075 (0.1619)	0.0042 (0.2246)
GDP	0.0000 (0.0000)***	0.0000 (0.0000)***	0.0000 (0.4861)	0.0000 (0.0017)***
ESG Score	0.0000 (0.5610)	0.0003 (0.2950)	0.0001 (0.2341)	0.0000 (0.2048)
Cons	0.0067 (0.2069)	0.8583 (0.0000)***	0.0603 (0.0000)***	-0.0621 (0.0000)***
Num. of Obs.	1,719	1,719	1,719	1,676
R-squared	0.40	0.09	0.59	0.34

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

The regression results of Case 2.3, which are shown in Table 5.8, are similar to the regression results of Case 2.1. Neither having a liability-focused portfolio nor having a higher ESG score has a significant impact on a bank's profitability or credit risk.

5.3 Case 3: Diversification vs Bank Performance with Dummy and Interaction Variables

In Case 3, the ethical status of a bank is measured with an ESG Dummy and the interaction dummy terms ESG x HHI Asset and ESG x HHI Liability, which are constructed as described in the previous chapter.

5.3.1 Case 3.1 Asset and Liability Diversification vs Bank Performance

In this case, while ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables, both HHI ASSET and HHI LIABILITY are included simultaneously as the independent variables along with bank- and market-related control variables. The results of the Hausman test, test for heteroskedasticity, and serial correlation tests can be seen in Table 5.9.

Table 5.9: P Values of the Model Specification Tests for Case 3.1

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0000	0.0000	0.0000	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0000	0.0000	0.2261	0.0000

Since there is autocorrelation in model specifications with dependent variables ROA, ROE, and CREDIT RISK, a Prais-Winsten regression is employed. For the NIM model, the Hausman test suggests a Fixed Effects Model. Since there is heteroskedasticity, a Fixed Effect Model with Robust Errors has been employed.

Results are shown in Table 5.10. Furthermore, in Table 5.11, results for the hypothesis test that the sum of the coefficients of the ESG DUMMY and the relevant interaction term is equal to zero are presented.

Table 5.10: Regression results - Asset and Liability Diversification vs Bank Performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten Regression	Prais-Winsten Regression	FEM with Robust Errors	Prais-Winsten Regression
Size	0.0003 (0.0429)**	0.0052 (0.0020)***	-0.0024 (0.0000)***	0.0008 (0.0413)**
Tier 1 Ratio	0.0000 (0.3079)	0.0004 (0.2454)	-0.0002 (0.0003)***	0.0007 (0.0004)***
Equity Ratio	0.0567 (0.0000)***	0.2283 (0.0013)***	0.0496 (0.0000)***	-0.0645 (0.0027)***
HHI LIABILITY	0.0007 (0.7401)	0.0158 (0.4547)	-0.0026 (0.2218)	0.0025 (0.5421)
HHI ASSET	0.0050 (0.0712)*	0.0645 (0.0205)**	0.0182 (0.0000)***	-0.0187 (0.0005)***
GDP	0.0000 (0.0000)***	0.0000 (0.0058)***	0.0000 (0.0592)*	0.0000 (0.0013)***
ESG Dummy	0.0022 (0.2384)	-0.0143 (0.496)	0.0038 (0.0729)*	-0.0014 (0.7476)
ESG x ASSET	-0.0069 (0.0234)**	-0.0162 (0.6208)	-0.0200 (0.0000)***	-0.0091 (0.1153)
ESG x LIABILITY	0.0011 (0.6056)	0.0228 (0.3252)	0.0090 (0.0000)***	0.0125 (0.0042)***
Cons	-0.0066 (0.1292)	-0.1142 (0.0350)**	0.0758 (0.0000)***	0.0010 (0.9254)
Num. of Obs.	5,209	5,209	5,209	3,837
R-squared	0.15	0.08	0.04	0.14

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

Table 5.11: Testing the coefficients related to interaction terms against zero for Case 3.1

	ROA	ROE	NIM	CREDIT RISK
Cons + ESG DUMMY	0.26	0.02	0.00	0.97
Cons + HHI ASSET + ESG DUMMY + ESG x ASSET	0.06	0.10	0.00	0.00
Cons + HHI ASSET + ESG x ASSET	0.04	0.21	0.00	0.01
Cons + ESG DUMMY + ESG x ASSET	0.02	0.02	0.00	0.41
Cons + HHI LIABILITY + ESG DUMMY + ESG x LIABILITY	0.43	0.04	0.00	0.17
Cons + HHI LIABILITY + ESG x LIABILITY	0.23	0.11	0.00	0.12
Cons + ESG DUMMY + ESG x LIABILITY	0.45	0.05	0.00	0.28

Note: The values are p values

Asset focus has a positive and significant impact on profitability and a significant and negative effect on the credit risk of the bank. In line with the previous results, asset focus enhances profitability and leads to lower credit risk. On the other hand, liability focus has no significant impact on bank performance. Similarly, ESG impacts only NIM significantly and the relationship is positive. The inclusion of the interaction terms highlights some additional findings. While banks with a higher asset focus have higher profitability (NIM and ROA), if these banks also have higher ESGs, then the positive effect of asset focus on profitability decreases. This finding is in line with the expectation that banks with a goal of maintaining higher ESG scores may operate under some restrictions in forming their asset portfolios. It seems like if the bank focuses on asset investments that help increase the bank's ESG score, such a focus hurts the bank's profitability.

On the other side of the story, the liability focus and ESG score interaction has a significant effect on NIM. This finding suggests that liability focus increases profitability (NIM) only for high-ESG banks. When a bank has self-imposed restrictions on its liability side to choose funding sources that will help maintain a high ESG score, these sources also help increase the spread between asset income and liability costs, possibly through a decrease in the cost funds.

5.3.2 Case 3.2 - Asset Diversification vs Bank Performance

For Case 3.2, while ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables, HHI ASSET is included by itself as the independent variable along with bank- and market-related control variables. Table 5.12 shows the results of the Hausman test, test for heteroskedasticity, and serial correlation tests. Since there is autocorrelation in model specifications with ROA, ROE, and CREDIT RISK, a Prais-Winsten regression is employed. For the NIM model, the Hausman test suggests a Fixed Effects Model. Since there is heteroskedasticity, a Fixed Effect Model with Robust Errors has been employed.

Table 5.12: P Values of the Model Specification Tests for Case 3.2

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0000	0.0000	0.0000	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0000	0.0000	0.2261	0.0000

Table 5.13 provides the regression results which investigates the relationship between asset diversification and various bank performance measures. Also, Table 5.14 presents the results for the hypothesis test that the sum of the coefficients of the ESG DUMMY and the relevant interaction term is equal to zero.

As can be seen in Table 5.13, when asset focus is included in the model by itself, results are very similar to case when both focus measures were in the models simultaneously. Table 5.13 shows that bank profitability increases and credit risk decreases when a bank is more asset-focused. Also, the ESG DUMMY has a significant and positive impact on ROA, NIM, and CREDIT RISK. Furthermore, when the interaction term results are analyzed in Table 5.14, it is seen that, as in Tables 5.11 and 5.12, while banks with a higher asset focus have higher profitability (NIM and ROA), if these banks also have higher ESGs, then the positive effect of asset focus on profitability decreases.

Table 5.13: Regression results - Asset diversification vs Bank performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten Regression	Prais-Winsten Regression	FEM with Robust Errors	Prais-Winsten Regression
Size	0.0002 (0.0640)*	0.0042 (0.0033)***	-0.0024 (0.0000)***	0.0003 (0.3905)
Tier 1 Ratio	0.0000 (0.2665)	0.0003 (0.3827)	-0.0002 (0.0148)**	0.0007 (0.0007)***
Equity Ratio	0.0577 (0.0000)***	0.2536 (0.0005)***	0.052 (0.0000)***	-0.0544 (0.0102)**
HHI Asset	0.005 (0.0644)*	0.0639 (0.0187)**	0.0176 (0.0007)***	-0.0206 (0.0001)***
GDP	0.0000 (0.0000)***	0.0000 (0.0016)***	0.0000 (0.0001)***	0.0000 (0.0001)***
ESG Dummy	0.0029 (0.0817)*	-0.0002 (0.9913)	0.0099 (0.0055)***	0.0060 (0.0749)*
ESG x Asset	-0.0067 (0.0193)**	-0.0113 (0.7183)	-0.0183 (0.0102)**	-0.0054 (0.3462)
Cons	-0.0052 (0.1706)	-0.0799 (0.0685)*	0.0752 (0.0000)***	0.0145 (0.1523)
Num. of Obs.	5,209	5,209	5,209	3,837
R-squared	0.15	0.08	0.03	0.15

Notes:

- 1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.
- 2) Values in parentheses are p values

Table 5.14: Testing the coefficients related to interaction terms against zero for Case 3.2

	ROA	ROE	NIM	CREDIT RISK
Cons + ESG DUMMY	0.49	0.05	0.00	0.05
Cons + HHI ASSET + ESG DUMMY + ESG x ASSET	0.13	0.38	0.00	0.49
Cons + HHI ASSET + ESG x ASSET	0.05	0.51	0.00	0.17
Cons + ESG DUMMY + ESG x ASSET	0.04	0.05	0.00	0.15

Note: The values are p values

5.3.3 Case 3.3 – Liability Diversification vs Bank Performance

For Case 3.3, as before, ROA, or ROE, or NIM, or CREDIT RISK are the dependent variables while HHI LIABILITY is included by itself as the independent variable along with bank- and market-related control variables. Table 5.15 shows the results of the Hausman test, test for heteroskedasticity, and serial correlation tests for Case 3.3.

Table 5.15: P Values of the Model Specification Tests for Case 3.3

	ROA	ROE	NIM	CREDIT RISK
Hausman Test	0.0000	0.0000	0.0000	0.0000
Test for Heteroskedasticity	0.0000	0.0000	0.0000	0.0000
Serial Correlation Test	0.0000	0.0000	0.2286	0.0000

Since there is autocorrelation, a Prais-Winsten regression is employed for the ROA, ROE, and CREDIT RISK model specifications. For the NIM model, the Hausman

test suggests a Fixed Effects Model. Since there is heteroskedasticity, a Fixed Effects Model with Robust Errors has been employed.

Table 5.16 presents the regression results and Table 5.17 presents the results for the hypothesis test that the sum of the coefficients of the ESG DUMMY and the relevant interaction term is equal to zero.

Table 5.16 Regression results - Liability diversification vs Bank Performance

	ROA	ROE	NIM	CREDIT RISK
	Prais-Winsten regression	Prais-Winsten regression	FEM with robust	Prais-Winsten regression
Size	0.0003 (0.0177)**	0.0041 (0.0125)**	-0.0022 (0.0001)***	0.0014 (0.0002)***
Tier 1 Ratio	0.0000 (0.3778)	0.0002 (0.5525)	-0.0002 (0.0045)***	0.0008 (0.0000)***
Equity Ratio	0.0555 (0.0000)***	0.2406 (0.0009)***	0.0464 (0.0002)***	-0.0751 (0.0004)***
HHI Liability	0.0015 (0.4326)	0.0198 (0.3381)	-0.0012 (0.7002)	0.0018 (0.6573)
GDP	0.0000 (0.0000)***	0.0000 (0.0099)***	0.0000 (0.0003)***	0.0000 (0.0001)***
ESG Dummy	-0.0008 (0.5800)	-0.0242 (0.1610)	0.0058 (0.0145)**	-0.0046 (0.2013)
ESG x Liability	0.0001 (0.9605)	0.0214 (0.3334)	0.0073 (0.0262)**	0.011 (0.0101)**
Cons	-0.0052 (0.1733)	-0.0545 (0.2558)	0.0806 (0.0000)***	-0.0229 (0.0136)**
Num.of Obs.	5,209	5,209	5,209	3,837
R-squared	0.15	0.08	0.03	0.14

Notes:

1) *, **, *** indicate significance at 1%, 5% and 10%, respectively.

2) Values in parentheses are p values

Table 5.17: Testing the coefficients related to interaction terms against zero for Case 3.3

	ROA	ROE	NIM	CREDIT RISK
Cons + ESG DUMMY	0.08	0.10	0.00	0.00
Cons + HHI LIABILITY + ESG DUMMY + ESG x LIABILITY	0.11	0.28	0.00	0.08
Cons + HHI LIABILITY + ESG x LIABILITY	0.30	0.73	0.00	0.24
Cons + ESG DUMMY + ESG x LIABILITY	0.13	0.22	0.00	0.08

Note: The values are p values

Unlike asset diversification, liability diversification has no significant impact on a banks' profitability or credit risk. However, when the interaction term test results are analyzed, it is seen that, similar to Tables 5.11 and 5.12, liability focus increases profitability (NIM) only for high-ESG banks. There is also some weak evidence that the credit risk for banks that are both liability-focused and have a high ESG score is somewhat higher. This finding may simply reflect the less diversified nature of the bank's balance sheet on both sides, making it harder to reduce the credit risk by funding the bank from a variety of sources and choosing investments by only emphasizing credit risk and profitability



CHAPTER 6

CONCLUSION

In this thesis, the impact of asset and liability diversification on bank performance is investigated by taking into account the ethical standing of the bank as measured by its ESG score. For this purpose, yearly data on 327 publicly traded US banks are included in the dataset. In line with previous studies (e.g. Acharya et al., 2002; Cotugno and Stefanelli, 2012; Acharya et al., 2006; Tabak et al., 2011) ROA, ROE, NIM, and Credit Risk ratios are used to measure a bank's profitability and riskiness, while a Herfindahl–Hirschman Index is used to measure its level of diversification on the asset and liabilities sides of the balance sheet. In order to examine the role of a bank's ethical status on the diversification versus performance relationship, banks in the top twenty-five percentile of the sample's ESG scores are categorized as high-ESG banks while the rest are categorized as low-ESG banks. Also, to analyze the interaction between asset or liability diversification and ethical status, additional dummy variables are constructed.

Fixed Effects and Random Effects Models are used to test the relationship between diversification and bank performance. For model specifications that have autocorrelation, Prais-Winsten regressions are employed.

The findings suggest that banks with higher ESG scores have more focused asset and liability portfolios. This result is in line with Karl (2015), where he argues that high-ESG banks need to be selective in the loans they give or the deposits they collect, leading to less diversified balance sheets.

Overall results suggest that banks with higher asset focus have higher profitability (ROA and NIM) and higher credit risk. Also, when the effect of the raw ESG scores is analyzed, it is not possible to present any evidence of a direct relationship between ESG scores and bank performance. However, when a bank's ethical standing is defined based on whether the bank has an ESG score in the top quartile of the sample banks, it is possible to show that the positive effect of asset focus on bank profitability is decreased when a bank also has a high ESG score. This finding is in line with the expectation that banks with a goal of maintaining higher ESG scores may operate under some restrictions in forming their asset portfolios. Hence, if the bank focuses on asset investments that help increase the bank's ESG score, such a focus hurts the bank's profitability since some of these "socially beneficial" investments may not generate returns that are as high as the returns on investments that have no social impact objective.

Such a finding may suggest that having a higher ESG score, i.e considering the well-being of the society and environment does not improve a bank's profits or decrease its riskiness. However, this should not imply that social and environmental friendly positioning does not pay off. According to Cristina and Alina (2009), ethical banks pursue obtaining social gains in addition to financial gains. High-ESG banks may have better reputations, better management, and may create more value for the future.

To conclude, having an asset-focused portfolio impacts bank performance and riskiness significantly. It helps banks to adapt to changes in the market conditions quickly and reduces risk. Also, although having a higher ESG score and a focused asset portfolio decreases the positive impact of asset focus on profitability, these banks strive to finance projects and companies that will result in environmental and social gains for the society at large. So, there is a price to pay for being socially responsible, but some banks seem to be willing to pay this cost for the good of the society.

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APPENDICES

A. TABULATED LITERATURE REVIEW



Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period	Base	
2000	Boot and Schneits	Market Discipline and Incentive Problems in Conglomerate Firms with Applications to Banking	-	-	-	Advanced Mathematical Modelling	- Diversification benefits can effectively relax the limited liability constraint such that adverse risk-taking incentives are mitigated - Conglomeration weakens market discipline and invites free-riding. An effective internal cost-of-capital allocation mechanism could then be useful in mitigating these effects
2017	Chang, Jang, Li and Kim	The Relationship Between the Efficiency, Service Quality and Customer Satisfaction for State-Owned Commercial Banks in China	China	20 state-owned commercial banks	2015	- Chinese banking statistics - Banks' annual reports	- The average technical efficiency of twenty state-owned banks is as high as 81.9%. - The bank's service quality has a positive impact on efficiency and customer satisfaction. - In the case of banks that are located in areas with high economic levels, customer satisfaction is lower than that of banks in lower regions. This is because customers in high economic level regions have higher expectations for service quality and it leads to lower customer satisfaction.
2011	Lin, Huang, Batmunkh, Tsendsuren and Batchuluun	World Financial Crisis vs. Customer Satisfaction on Financial Products and Services: An Empirical Study of the Mongolian Banking Industry	Mongolia	1 Bank	2009-2010	Survey Techniques	- Key Performance Index (KPI) were analyzed using Microsoft Excel and SPSS. - During the period 2007 to 2010 customers became reluctant to deposit their money in banks, or to take out loans

Year	Author	Article Name	Data			Method Used in Empirical Studies		Results of Empirical Studies
			Origin	Size	Period	Base		
2011	Goyal and Joshi	A Study of Social and Ethical Issues in Banking Industry	-	-	-	-	A series of development that are taking place in current business scenario have been gone through.	- It is necessary for banks to attain sustainable competitive advantage by creating ecofriendly products. - Banks can project themselves as a socially and ethically oriented organization by disbursement of loans merely to those organizations, which has environmental concerns.
2006	Buttle	Diverse Economies and the Negotiations and Practices of Ethical Finance: The Case of Charity Bank	UK	1 Bank	-	- Employee Interviews - Annual Reports	Concept of a sociofinancial narrative to describe the tensions between the social responsibility of the finance organisation to its lenders and the responsibility to remain financially sustainable into the future is developed.	How theoretical debates on economic-social relationships are expressed on a day-to-day basis is demonstrated.

Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period	Base	
2009	Scheire and De Maertelaere	Banking to Make a Difference	Banks on GABV	12 Banks	2007-2008	- Annual Reports - Banks' Websites	- GA banks all have ethical, ecological, social, value-driven ambitions, goals and missions that are not accompanied or restricted by a profit maximization target - GA banks have been founded to serve the un(der)served - Bad loan provisions are relatively low and have been dropping over the years. - GA banks have not been speculating on repackaged, complex and unclear derivative products. - All GA banks are relatively small banks, but they are growing at a very fast pace. - Deposits have grown at a very fast pace and have allowed GA banks to grant a rising number of loans to their clients. - GA banks are 'banking with a face'.
2011	Benedikter	Social Banking and Social Finance	Europe, US	-	-	-	- Social Banks are defined as bank with a conscience. - The biggest social banks in Europe are determined as the German Gemeinschaft für Leihen und Schenken (GLS) Bank, the Dutch Triodos Bank, the Italian Banca Etica (\$0.8 billion), the Swiss ABS bank and the Danish Merkur Bank. - It is concluded that if three goals that Nobel Peace Award Laureate and Michail Gorbachev outlined as imperative for a better future - peace, fighting poverty and promoting global social justice and common wealth, and protecting the environment - is embraced then social banking and social finance may indeed have contributions to offer.

Year	Author	Article Name	Origin	Size	Data Period	Base	Method Used in Empirical Studies	Results of Empirical Studies
2015	Karl	Are Ethical and Social Banks Less Risky? Evidence from a New Dataset	EU, OECD	65 Alternative Banks and 3278 Traditional Banks	2006	· GABV, INAISE, FEBEA for the social banking literature · BankScope · Dedicated websites · Banks' websites	· Mean Comparison · Panel Regression Techniques	· Alternative banks are significantly more stable (in terms of z-score) than their conventional counterparts. · Alternative banks have lower loan to asset ratios and higher customer deposit ratios than conventional banks.
2018	Climent	Ethical versus Conventional Banking: A Case Study	Spain	1 Ethical Bank and 1 Conventional Bank	2012-2015	· Banks' websites	· Balance sheets, profit and loss accounts, liquidity ratios, indebtedness, and returns provided by both banks were analyzed.	· Ethical banking is less profitable than conventional banking. · Customers are attracted to the social investments and financial transparency that characterize ethical banking.
2009	San-Jose, Retolaza and Gutierrez	Ethical Banks: An Alternative in the Financial Crisis	Europe	11 Ethical, 40 Commercial, 34 Savings Banks and 25 Credit Cooperatives	-	· BankScope, · Banks' websites, · Questionnaires sent to customers by mail to get more information about the placement of assets	· Information transparency, placement of assets, guarantees and participation have been analyzed. These four factors are grouped in an index called Radical Affinity Index (RAI).	· Transparency of information and placement of assets are factors that differentiate ethical banks and the rest of financial intermediaries. · The guarantees and participation do not support clear evidence to the analysis. · RAI is a functional and useful index to show the ethical policy of financial intermediaries.
2009	Cristina and Alina	The Financial Crisis Impact on Ethical Financial Institutions	EU	15 Banks	2007-2008	· Banks' websites	· Data Envelopment Analysis	· APS Bank in Malta and the Triodos branch in Belgium recorded a score of 100% in both 2007 and 2008, therefore, the basic objective of ethical banks has been fulfilled. · The less efficient proved to be the Triodos branch in Spain, for which we obtained an efficiency score of 308.08% in 2007 and 356.26% in 2008.

Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period	Base	
2002	Cowton	Integrity, Responsibility and Affinity: Three Aspects of Ethics in Banking	-	-	-	-	- Integrity is important to generate the trust necessary for any banking system to flourish. - Responsibility highlights contemporary banks' need to take into account the consequences of their lending policies. - Affinity refers to a way in which depositors and borrowers can be brought closer together than they are in conventional western banking.
2006	Buttle	'I'm not in it for the money': Constructing and Mediating Ethical Reconnections in UK Social Banking	UK	-	-	- Banks' websites - Employee interviews	- The SFOs employ a connective narrative of their activities to induce savers to care about the consequences of investment decisions. - Not all investors were receptive to employee's tactics.
2015	Chew, Tan and Hamid	Ethical Banking in Practice: A Closer Look at the Co-operative Bank UK PLC	UK	1 Bank	2012-2014	- Banks' websites - Employee interviews	Co-operative Bank has done tremendously well in sustaining the UK's socioenvironmental development, which justifies the reason why the Co-operative Bank has won numerous prestigious awards and is being well recognised nationally and regionally.
2017	Callejas-Albiñana, Martínez-Rodríguez and de Vildas-Carrasco	Assessing the Growth of Ethical Banking: Some Evidence from Spanish Customers	Spain	16 Banks	-	Banks' websites	- If the Euribor continues to fall as it has to date, banking consumers-investors could change the characterization of the banking system by choosing the investments offered by ethical banks through deposits. - If the Euribor continues to register low values, as it has to date, ethical banking could gain ground on traditional banking, as it is more effective at increasing GDP.

Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period		
2011	San-Jose, Retolaza and Gutierrez-Goitia	Are Ethical Banks Different? A Comparative Analysis Using the Radical Affinity Index	Europe	11 Ethical, 40 Commercial, 34 Savings Banks and 25 Credit Cooperatives	-	· BankScope · Banks' websites · Questionnaires sent costumers by mail to get more information about the placement of assets	· Transparency of information and placement of assets are factors that differentiate ethical banks from other financial intermediaries. Guarantees and participations, however, do not offer clear evidence to the analysis.
2011	Weber and Remer	Social Banking and the Future of Sustainable Finance	-	-	-	· Banks' websites · GABV	· Social banking defined aiming to have a positive impact on people and the environment by means of banking. · In order to keep on growing, social banks have to: 1. Advance their products 2. Broaden their product portfolio to become less dependent on interest rates 3. Differentiate themselves from conventional banks that start to distribute socially responsible products and services 4. Focus on positive impact finance and 5. Develop measures and indicators that demonstrate their positive impact on the society, communities, the environment and sustainable development in an objective and transparent way

Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period	Base	
1999	Cowton and Thompson	Ethical banking: Progress and Prospects	Europe	11 Banks	-	Banks' websites	- There are two commonly accepted properties that define ethical banking: 1. Obtaining of social profitability, understood as funding economic activities with social added value and as the absence in any case of investments in speculative projects or in those that fulfil negative criteria. 2. Obtaining of economic profitability, which means benefits. The dimension of obtaining benefit refers to the good management of the bank, because ethical banks do not distribute - Triodos Bank have a restricted but transparent approach to lending - Triodos Bank brings depositors and borrowers closer together and give their savers a real sense of what they are financing. This approach offers potential benefits to nonprofit and voluntary sector organisations, whether as depositors or borrowers.
2000	Cowton and Thompson	Financing the Social Economy: A Case Study of Triodos Bank	UK	1 Bank	1997-1998	Banks' websites	- Balance sheets, profit and loss accounts, liquidity ratios were analyzed. - A model in which firm-based intangible resources, including innovation, human resources, reputation, and organizational culture, are mediator variables between CRP and CFP is proposed. - Novel two-stage estimation strategy to determine the relationship between CRP and CFP is used.
2010	Surroca, Tribo and Waddock	Corporate Responsibility and Financial Performance: The Role of Intangible Resources	Europe, North America and Australia	599 company	2002-2004	Sustainalytics Platform	There is no direct relationship between corporate responsibility and financial performance.

Year	Author	Article Name	Data			Method Used in Empirical Studies	Results of Empirical Studies
			Origin	Size	Period		
2003	Orlitzky, Schmidt and Rynes	Corporate Social and Financial Performance: A Meta-Analysis	-	-	-	- Narrative literature reviews - Vote-counting method of aggregation - Hunter and Schmidt's statistical aggregation techniques	- CSP is positively correlated with CFP - Relationship between CSP and CFP tends to be simultaneous - Reputation appears to be an important factor for the relationship - Corporate virtue in the form of social and environmental responsibility is rewarding in more ways than one.
2009	Soana	The Relationship Between Corporate Social Performance and Corporate Financial Performance in the Banking Sector	Worldwide	21 International and 47 Italian Banks	2005	- Eventual correlation between CSP (proxied using ethical ratings) and CFP (proxied using market and accounting ratios) has been examined - A link between CSP and CFP has been examined by means of the establishment of a linear bivariate correlation using the statistical software SPSS.	There is no statistically significant link that indicates any positive or negative correlation between CSP and CFP.
2018	San-Jose, Retolaza and Lamarque	The Social Efficiency for Sustainability: European Cooperative Banking Analysis	EU	2752 Financial Institutions	2014	- DEA Analysis - Factorial Analysis of Variance	There is no tradeoff between social efficiency and economic efficiency.

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2018	Sharma and Anand	Income Diversification and Bank Performance: Evidence from BRICS Nations	BRICS Nations	169 Banks	2001-2015	· Bloomberg · World Bank	· A positive relationship between diversification and performance measured in terms of bank risk and returns for medium and large size banks. However, for small banks this relationship is negative suggesting a "diversification discount".
2019	Shim	Loan Portfolio Diversification, Market Structure and Bank Stability	US	All commercial banks in US	2002-2013	Call Reports	· Increased loan diversification has a positive impact on the bank's financial strength. · Market concentration is negatively associated with bank insolvency risk, consistent with the "concentration-stability" view. · Diversifying banks operating in highly concentrated markets are more financially stable compared to those in less concentrated markets.
2018	Abuzayed, Al-Fayoumi and Molyneux	Diversification and Bank Stability in the GCC	GCC Countries	107 Banks	2001-2014	World Bank	· Income or asset diversification does not enhance bank stability · There is evidence of a non-linear relationship between non-interest (non-financing) income and stability indicating that banks are able to reduce risk at higher levels of diversification. · Factors such as improved institutional quality, macroeconomic conditions, and other bank-specific factors motivate greater stability.

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2013	Sawada	How Does the Stock Market Value Bank Diversification? Empirical Evidence from Japanese Banks	Japan	113 banks and financial groups with subsidiary banks	1999-2011	Nikkei NEEDS - Financial Quest database	Revenue diversification affects bank value and risk differently depending on particular bank characteristics, such as organizational form and traditional banking business performance.
2005	Iskandar-Datta and McLaughlin	Global Diversification: New Evidence from Corporate Operating Performance	Worldwide	1,389 firms	1997-2003	The Compustat Geographical Segment database	- Global diversification does not result in misallocation of investment resources. - Cross-subsidization and the increase in the organizational complexity due to diversification are not influential factors to firm operating performance
1998	Klein and Saïdenberg	Diversification, Organization, and Efficiency: Evidence from Bank Holding Companies	-	412 multi-bank holding companies and 412 matching pro forma holding companies	1990-1994	Statements of Income and Condition (Call Reports)	Diversification within the holding-company structure does bring benefits. The multi-bank holding companies hold less capital and do more lending, on average, than their pro forma benchmarks. They also earn enough income to compensate for the administrative costs of internal organization