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## CORPORATE SOCIAL RESPONSIBILITY: HOW DOES IT AFFECT THE FINANCIAL PERFORMANCE OF BANKS? EMPIRICAL EVIDENCE FROM US, UK AND JAPAN

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### ABSTRACT

This paper examines the financial performance of CSR and Non-CSR banks using financial ratios and frontier efficiency analysis. We got accounting information for banks in Japan, US and UK quoted on the FTSE4Good global index from Bankscope database. They include thirty-eight (38) financial and economic ratios based on variables such as Asset quality, Capital, Operations and Liquidity; that captured major scope of financial performance. In addition, we used a non-parametric linear programming technique known as Data Envelopment Analysis to create a piecewise linear frontier that helps to determine the efficiency levels for both a common and separate frontier analysis. First, we find a positive relationship between corporate social responsibility and financial performance. Banks that incorporate CSR have better asset quality; capital adequacy; and are more efficient in managing their asset portfolios and capital. Second, we also find that geographic location regulates the relationship between CSR and FP during economic contraction, such that the relationship differs across relationship and transactional banking models. The findings are to an extent consistent with prior analysis on the CSR-FP link.

**Keywords:** *Corporate Social Responsibility, Financial Performance, financial ratios, frontier analysis, value creation.*

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### INTRODUCTION

In the global market, corporate firms want to establish strong competitive advantage over their rivals in the same industry. They seek value creation and above average risk-adjusted rates of return in order to outperform their benchmarks. In recent times, it has been generally perceived that socially responsible firms can secure this advantage. In a paper by Salzman et al, (2005) they provide evidence that a growing number of companies perceive value addition in socially responsible behaviour. Friedman (1970) asserts that the social responsibility of firms is to maximize profits. Credit markets and banking systems experienced contracted liquidity from 2007-2008 due to a drop in the US housing prices. This made refinancing of mortgage loans to be somewhat difficult as borrowers were left with low-value houses on one side and debts on the other side. Josh and Bradley (2008), report that major banks and other financial institutions around the world have reported losses of approximately \$435 billion as of July 17, 2008. An 89% decline in profit for the 2007 fourth quarter was experienced by 8,533 US banks insured by FDIC, the worst bank and thrift quarterly performance since 1990 (FDIC, 2008). Northern Rock and Bear Stearns have both required emergency assistance from central banks due to the crisis (BBC News Channel, 2008). The issue of financial engineering also came into play where mortgage lenders pass the rights to the mortgage payments and related credit/default risk to third-party investors via mortgage-backed securities (MBS) and collateralized debt obligations (CDO). With the credit risk off the balance sheets of originating banks, they had no real incentive to ensure that these loans were granted to

credit-worthy individuals. Mortgage frauds where borrowers simply misrepresented their details were easier to perpetrate (Financial Crimes Enforcement Network, 2006). Financial engineering by banks should not result in economic instability as the subprime crisis has. The ability of transfer strategies to create global economic crisis reveals that a re-assessment of risk management is necessary. Indicating that sustainable corporate social responsibility (CSR) has been relegated to the background while undertaking massive risk transfer strategies. Wood (1995) defined CSP as "a business organisation's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs and observable outcomes as they relate to the firm's societal relationships". Luc Renneboog et al, (2008) define it as stakeholder governance i.e. an amalgam of good corporate governance (protecting shareholders' interest), sound stakeholder relations (protecting the interest of other stakeholder, including those of employees and local communities), and environmental care (protecting the environment). In a recent study, Tirole (2001) describe it as "the design of institutions that induce or force management to internalize the welfare of stakeholders". Fombrun and Shanley (1990) also report that stakeholders view socially responsible firms as a signal upon which they can base their judgements regarding quality or reputation. Also, Michael Hopkins (1999) defined CSR as treating the stakeholders of the firm ethically or in a socially responsible manner. However, we define CSR as the ability of corporate firms to insist on high standards of transparency, accountability, innovations and good corporate governance to stakeholders which will on the long run increase profitability. If sustainable CSR programme minimises the impact of risk transfer strategies that resulted in the global credit crisis and would have reduced the massive losses experienced by banks in the credit crisis then it's worthwhile incorporating these strategies. A sustainable CSR programme by banks and financial institutions will keep in view the overall impact of risk transfer strategies to stakeholders. Duty of care sustainable CSR suggests that businesses have a duty of care to all of their stakeholders. While taking financial decisions, banks should seek a balance between the financial, economic, social, environmental and other consequences of these decisions.

In this paper, we extend previous research on the relationship between CSR and Financial Performance (FP). Although numerous researches have been conducted producing a rich body of evidence on the CSR-FP link, these previous studies have produced contradictory conclusions. This is as a result of samples drawn from multiple industries and various measurement difficulties which have been kept vague. Our specific objective is to ascertain if "Sustainable firms" outperform "Unsustainable firms". The sample we took cover sustainable banks listed on the FTSE4Good index, which is a CSR Index, and non-sustainable banks that are not listed on the index due to their failure to satisfy the condition for sustainability; using financial ratios and frontier efficiency analysis. We used thirty eight financial and economic ratios generally considered to capture major dimensions of financial performance in the banking industry and also conducted a DEA analysis in the measurement of bank efficiency. The data were sourced from Bankscope database and is free of any measurement bias. The paper contributes to knowledge by providing empirical proof from a single industry across three countries; US, UK and Japan; that has a set of unique features to proffer further insights into the question and also take the edge off some of the measurement problems of earlier research. The remaining parts of this paper are as follows: section 2 elaborates the banking industry framework, the

CSR-FP relationship and testable hypotheses. Section 3 explains data, variables used and the methods applied. Section 4 presents the results and discusses them and section 5 concludes with a summary.

## **FRAMEWORK OF THE BANKING INDUSTRY**

### ***US***

The National Banks in the US are by law members of the Federal Reserve System which has the responsibility to supervise and regulate other segments of the banking industry to ensure a safe and sound banking practices; and compliance with various banking laws and regulations. Also, there exist regional banks that were more diverse and had rigorous competition. These regional banks provide credits to customers and even to the US economy as a whole. However, the financial crisis of 2007 made them to assume high debt burdens from loan defaults. This resulted in their inability to lend thus slowing economic activities. This study tries to examine if the US banks that are CSR compliant performed better during the sharp collapse in liquidity.

### ***Japan***

The banking system in Japan is viewed as relationship-oriented (Wan *et al*, 2008). They find that Japanese banks that has strong social relationships performed better during macroeconomic expansion and worse in contraction cycles. According to him, the effect is due to the fact that in domestic macroeconomic expansions, relationship banking can leverage on close ties with clients to benefit from the client's thriving business. Relationship banks are viewed by its clients as a helping long-term partner giving it a clear social role. Hence, it would enjoy superior financial performance during these economies. However, during economic contractions, a relationship bank would be significantly constrained by the same relationship and role that it had enjoyed during domestic macroeconomic expansions. It would find it difficult to sever its close ties with financially distressed clients, and would be expected to continue to enact its social role to support clients steadfastly. Such constraints are likely to have a negative impact on its financial performance during contractions. While the Japanese banking model is based on relationship banking, due to cost and efficiency concerns, a number of them have adopted transaction banking models. Therefore, this research focuses on the year 2007 which is a period of macroeconomic contraction for Japan and the most major economies to investigate if banks with a social role in Japan were able to perform better than their counterparts who have deflected from the social role model.

### ***UK***

A study by Trethowan and Scullion (1997) reveal that the banking sector in the UK prior to the deregulation of financial services markets in the 1980s was largely a protected sector with little competition. Advances in technology and the transition from central control of economies, resulted to great changes in the banking industry's operating environment. 1987 to 1990 represents a period where the big four banks lost £3.8 billion as bad debts. This was largely attributed to the economic cycle with accelerating inflation. Government's intervention caused a fall in demand with a reduction in property prices and borrowers owing more than the value of their property. Amidst this bad debt scenario consumers were seeking qualitative service while the larger UK banks were addressing their profitability issues with aggressive marketing and charging fees to

recover costs. The smaller retail banks, however, were more successful because of their focus on their core business of providing retail financial services in their local market, and being responsive to the local communities that they serve (Trethowan and Scullion, 1997). Product innovation is no longer a source of sustainable competitive advantage for banks as sophistications in IT products are easily and quickly copied (Trethowan and Scullion, 1997). The approach of the small retail banks should therefore, shape strategy formulation in the banking industry. 2007 represents a similar economic cycle to the 1990's and hence, this research investigates if the performances of UK banks that incorporate CSR similar to the small retail bank have performed better. Thereby, pointing the strategies that banks must continue to develop to be successful.

### **Corporate Social Responsibility and Financial Performance**

In modern business world, corporate social responsibility has been emphasized by stakeholders as a driving tool for success to be accomplished. Heal (2005) asserts that by anticipating and minimizing the potential conflicts between corporations and society, CSR plays a role in reducing the costs of such conflicts which may in the long run lead to higher NPVs. Another study by Fisman *et al* (2006) demonstrate that CSR may act as a credible signal of firm's trustworthiness in providing quality products. The underlying principle behind CSR shows that companies that exhibit stakeholder responsibility enjoy risk adjusted above-average returns. This is documented in recent studies; Allen *et al* (2007) compare the stakeholder-oriented and shareholder-oriented corporate policies and prove that countries with prevalent stakeholder-oriented firms have higher firm values relative to shareholder-oriented ones. Gompers *et al*. (2003) and Cremers and Nair (2005) make evidence that good corporate governance generates positive abnormal returns for US companies; and Bauer *et al* (2004) confirm this for European companies. Furthermore, Derwall *et al*. (2004) illustrate that a portfolio of firms with high environmental scores outperforms a portfolio of firms with low scores. Brekke and Nyborg (2005) show CSR as a screening device for firms to attract motivated workers.

Despite numerous terms and several definitions no general consensus exists on the term CSR, yet it has become an increasing evident and crucial component of overall performance of business organisation. Companies face significant demands on CSR largely driven by the increasing pressure from stakeholders such as customers, employees, and socially responsible investors to demonstrate their commitment to the society (Brammer *et al*, 2006). Frooman (1997) conducted a meta-analysis of 27 event studies that analyzed the relationship between stock market reaction and socially irresponsible and illegal behaviour and conclude that the market reacted negatively to firms that committed socially irresponsible or illegal acts, which is evidence for a positive CSR-FP link. Waddock and Graves (1997) analyze a total of 469 S&P 500 companies using a weighted composite measure of CSR similar to a KLD index and three accounting measures (return on equity, return on assets, and return on sales) as FP variables by means of regression analysis. They also incorporate size, risk, and industry as control variables and test for various econometric specifications of the model including lagged variables. Their results support a positive CSR-FP link. Stanwick and Stanwick (1998) did a regression analysis of multiple cross-sections for the years 1987-1992 with approximately 115 firms in each cross-section. They used the Fortune Survey of Corporate Reputation as the measure of CSR which was the dependent variable in a regression

equation. The return on sales, size, and environmental performance variable based on the EPA Toxic Release Inventory Report were used as independent variables. They find a significant positive relationship between CSR and FP. Also, Lee and Douglas (1997) compared CSR and FP for 67 large US corporations over the eleven-year period 1982 to 1992. They used three components of the Fortune Survey of Corporate Reputation to represent CSR and return on assets, return on equity, and return on investment to represent FP. They also find a positive CSR-FP link (Simpson and Kohers, 2002). Further findings uniform with prior study on the link between the CSR and FP are those of McWilliams and Siegel (2000) test the CSR-- FP link with a regression model that used a dummy variable indicating inclusion of a firm in the Domini 400 Social Index (DSI 400) as the measure of CSR. They used an average of annual values for the period 1991-1996 for 524 large U.S. corporations in a regression model that included a measure of financial performance as the dependent variable. CSR, industry, and expenditures for research and development were independent variables. The results suggest that inclusion of the research and development variable in the model causes the CSR variable to be insignificant which leads to the conclusion that there may not be a CSR-FP link if the regression model is properly specified. Marc *et al*, (2003) in their meta-analysis of 52 quantitative studies, with a total sample size of 33,878 observations, conducted on the relationship between CSR and FP and find that overall CSR and financial performance are generally positively related across a wide variety of industry and study contexts. This positive correlation supports the stakeholder view which posits that a firm's financial success is contingent on its ability to formulate and execute a corporate strategy that manages effectively its relationship with stakeholders (Brammer *et al*, 2006). They also observed that CSR is more highly correlated with accounting-based measures of FP than with market-based indicators, and CSR reputation indices are more highly correlated with CSR than are other indicators of CSR. Allouche and Laroche (2005) analysed 82 studies while Wu (2006), analysed 121 studies with 39 of them focused on the CSR-FP link. More recently, Margolis *et al*. (2007) performed a comprehensive meta-analysis of 167 studies from 1972 to 2007 and found an overall positive effect between CSR and FP.

A number of researchers have attributed the lack of conclusive findings of the CSR-FP link to conceptual, operational and methodological difference. Griffin and Mahon (1997) provide a direction for future empirical research into the CSR-FP relationship. They observed that there was a focus on multi-industry samples with about 78 percent of the studies reviewed being based on multiple industries. Different industries have differing regulatory standards (Davidson and Worrell, 1990) and grouping samples from different industries ignores the unique characteristics of an industry and nature of CSR unique to that industry (Griffin and Mahon, 1997). Tim and Shawn (2000) also suggest that CSR research should be narrowly defined in operational terms to a specific industry or setting. CSR is highly influenced by the nature of stakeholder actions and different industries are challenged by a different portfolio of stakeholders with different degrees of activity in different areas (Griffin and Mahon, 1997; Tim and Shawn, 2000). Therefore, a multiple industry studies confound this relationship between stakeholders and appropriate measures of CSR and FP unique to those stakeholders (Griffin and Mahon, 1997). Industry is therefore an important variable in empirical investigations of the CSR-FP link. Focusing on a single industry emphasizes internal validity rather than the external validity of multiple industry analyses (Griffin and Mahon, 1997). This research makes a very

important contribution in that it presents an analysis of a large sample of firms from the same industry across three economies (Japan, UK and US). However, a few studies have analyzed individual industries; and their sample sizes have been very small (Griffin and Mahon, 1997). Another observation made by Griffin and Mahon (1997) is the need for multiple measures of FP. Previous investigations have largely relied on only one measure of FP. Similar to (Mackey *et al.*, 2007), Griffin and Mahon (1997) argue that accounting measures rather than market-derived measures should be used because market measures may be picking up more than just FP. This study uses thirty eight financial and economic ratios generally considered to capture major dimensions of financial performance in the banking industry. Finally the issue of appropriate measurement of CSR which Griffin and Mahon (1997) tried to address is the use of multiple sources of information to produce a comprehensive metric of CSR. The FTSE4Good Index is the CSR metric used in this study. Also, the Community Reinvestment Act, a unique banking measure, was used alongside the FTSE4Good index as a metric for US banks.

### **Testable Hypotheses**

Based on previous investigations, the link between corporate social responsibility and financial performance has been hypothesized to be positive, negative, and neutral. The ability of researchers to offer rational theoretical justification for each of the possible positions demonstrates the need for both a more unified theory and reliable empirical verification (Marom, 2006). Lee and Douglas (1997) and Waddock and Graves (1997) provide a summary of previous conceptual explanations for a negative, neutral, and positive relationship between CSR and FP. They offer a "*Managerial Opportunism hypothesis*" as a rationale for a negative CSR-FP link and suggest that when financial performance is strong, managers will reduce expenditures on social performance because they can increase short-term profitability and increase their personal compensation that is tied to short-term profitability. Conversely, when financial performance is poor, managers will attempt to divert attention by making expenditures on conspicuous social programs. Neoclassical economists argue that CSR causes the firm to incur costs that reduce profits and shareholder wealth supporting a negative CSR-FP link (Waddock and Graves, 1997; Lee and Douglas, 1997).

The finding of a neutral (no) relationship is explained by the study that the general situation of the firm and society is so complex that a simple, direct relationship between CSR and FP does not exist (Waddock and Graves, 1997). McWilliams and Siegel (2001) argue for a neutral, or nonexistent, relationship between CSR and FP from a supply and demand theory of the firm which assumes shareholder wealth maximization. They argue that firms produce at a profit-maximizing level, including the production of social performance. This leads each firm to supply different amounts of social performance based on the unique demand for CSR the firm experiences. In equilibrium, the amount of CSR produced by firms will be different but profitability will be maximized and equal. The implicit and explicit cost argument favours a positive CSR-FP link. Attempts by a firm to lower implicit costs through socially irresponsible actions are hypothesized to result in higher explicit costs (Waddock and Graves, 1997). "*Social Impact hypothesis*" like with stakeholder theory suggests that meeting the needs of various non-owner corporate stakeholders will have a positive impact on financial performance (Lee and Douglas, 1997). The actual costs of CSR are thought to be minimal when compared to the

potential benefits to the firm thus "Good management" is expected to do most things well which includes social and financial performance (Waddock and Graves, 1997). In the absence of a single accepted theoretical foundation for the CSR-FP link, we develop our hypotheses based on our own judgment. We however, find the "Social Impact" and "Good Management" hypotheses, to be the most convincing theoretical arguments that support a positive link between CSR and FP; hence our first null hypothesis:

***H<sub>01</sub>: The relationship between social performance and financial performance in the banking industry is either zero or negative***

Wan *et al.* (2008) find that the relationship banking model of Japanese banks enjoys superior financial performance during a period of boom and in a recession brings about a negative impact on its financial performance. On the other hand, Trethowan and Scullion (1997) also find that transactional banking model are seen to be more successful in a recession where in addition to their core business are responsive to the local communities that they serve. This implies that a positive link between CSR-FP would be expected in the UK and US in 2007 which was a period of recession while Japan would experience a negative link. This institutes the second null hypothesis:

***H<sub>02</sub>: The relationship between social performance and financial performance during a recession is either zero or negative across all geographic location.***

## **DATA AND METHODOLOGY**

### ***Data and sample***

We compiled accounting information for banks in Japan, UK and US from the London-based International Bank Credit Analysis Limited's Bankscope database. Bankscope has been extensively used in a number of efficiency studies and remains one of the most comprehensive databases for information on the banking industry globally (Figueira *et al.*, 2006). The data gotten is based on the "Intermediate approach" which views banks as performing intermediary roles primarily by collecting funds from surplus units at a cost and making the funds available to deficit units at a price higher than the cost. Thus output is measured by the financial value of accounts and inputs by labour, capital, interest/total cost and prices. This is documented in studies by Berger and Humphrey (1997), Drake (2003), Sathye (2001) and Fukuyama (1993, 1995). Our total sample is composed of two groups of firms that include 135 Japanese, UK and US banks quoted on the FTSE global index. The major limitation faced while extracting data from Bankscope is duplication and missing data for some banks. This resulted in the exclusion of a number of banks quoted on the FTSE global index. We used the financial information from Bankscope to construct the basic variables to be used in the efficiency tests. These variables include Asset quality, Capital, Operations and Liquidity. Asset quality ratios are indicative of the quality of earning assets (especially loans) of the bank and can be seen as a measure of risk. Capitalisation ratios relate to the adequacy of the equity in the business to insulate the bank against losses or shocks. Operations ratio measure the performance of the banks whilst liquidity ratios are a measure of the ability of the bank to meet its obligations as and when due.

### ***Methods***

We measured CSR based on FTSE4Good index, with banks listed on the FTSE4Good making up our sample of sustainable banks while non-sustainable banks were those not listed on the FTSE4Good index due to their inability to fulfil the requirements of sustainability. The idea underlying this index is that sustainability practices constitute a potential element for long-term value creation from which shareholders will benefit (López et al., 2007). Many investors consider this a crucial value for success (Cheney, 2004, p. 14; Stuart and Mark, 2003, p. 57). The criteria used to measure CSR on the index are working towards environmental sustainability, developing positive relationships with stakeholders, up-holding and supporting universal human rights, ensuring good supply chain labour standards and countering bribery. These are similar to those proposed by the most frequently used CSR guides (López et al., 2007) and are used by a large number of European firms to develop and disclose their sustainability reports. The index works in association with the Ethical Investment Research Service (EIRS) and its network of international partners to research company corporate responsibility performance. In order to keep up with changing CSR requirements the FTSE4Good indices are reviewed semiannually in September and March, by the FTSE4Good Policy Committee. The important contribution of this CSR measure is that it's not been used before for a specific industry in CSR--FP analyses.

The Community Reinvestment Act of 1977 (CRA) mandates that depository institutions serve their communities thus CRA was passed to ensure that commercial banks meet the credit needs of the markets where they do business, especially the needs of low-income customers as well as provide private funding for local housing needs and economic development (Kenneth Spong, 1994). The legislation is generally known as an attempt to restrict the practice of "redlining" but the act covers a broader spectrum of bank functions. The core business of commercial banks is lending the deposits of customers to other customers who need loans. Meeting the credit needs of a community is central to the economic and social health of that community. The CRA rating is an indication of the social responsibility banks exhibit in this core activity. The dimensions of social performance measured by the CRA rating are not exhaustive but do cover several of the critical facets of the external social performance of the industry (Simpson and Kohers, 2002). They further reviewed a sample taken from all national banks examined for CRA compliance in 1993 and 1994, for the CSR-FP. Though this research is not the first attempt at using this CSR metric its important contribution is that it investigates the CSR-FP link for national banks examined for compliance in 2006. We measured financial performance using financial ratios and frontier efficiency analysis. Financial and economic measures are the basis for measuring the performance of a firm. (Alex Manzoni, 2007). The financial ratios were used to avoid the inclusion of perceptions of other macroeconomic variables captured by market measures. (López et al., 2007). We applied thirty eight financial and economic ratios that are generally considered to capture major dimensions of financial performance in the banking industry.

Also, we used a non-parametric approach known as the Data Envelopment Analysis (DEA) that uses a linear programming technique to create a piecewise linear frontier that helps in determining the efficiency levels of decision making units (DMUs) within a sample. The technique works by comparing the DMUs in a sample to the "best practice" DMU and



constructing an efficient frontier with the “best practice” DMU that envelops the other DMUs in the sample making all data points to lie on or below the frontier. The benefits of using frontier analysis as discussed by Berger and Humphrey (1997) include the presentation of an objective numerical score and ranking that measures efficiency; an efficiency benchmark that is easily identifiable; and the use of a better economic optimisation measure.

Charnes *et al.* (1994) provide twelve strengths of DEA which are: focus is on individual DMUs in contrast to population averages; each DMU has a single aggregate measure for the utilization of input factors (independent variables) to produce desired outputs (dependent variables).; it can simultaneously utilize multiple outputs and multiple inputs with each being stated in different units of measurement; adjustments can be made for extraneous variables; categorical (dummy) variables can be included; computations are value-free and do not require specification or knowledge of *a priori* weights of prices for the inputs or outputs and there is no restriction on the functional form of the production relationship; it can accommodate judgment when desired; it can produce specific estimates for desired changes in inputs and/or outputs for projecting DMUs below the efficient frontier onto the efficient frontier; results are Pareto optimal, focus is on revealed best-practice frontiers rather than on central-tendency properties of frontiers and it satisfies strict equity criteria in the relative evaluation of each DMU.

Coelli *et al.* (2005) illustrates the technique as follows: Let us assume that we have a sample data with **N DMUs** that have **K** inputs and **M** outputs. The input matrix **K x N** and output matrix **M x N** for each **DMU** is represented by the column vectors **xi** and **yi** respectively, where the number of **DMUs** ranges from **1** to **i**. Using a simple ratio form for measuring productivity (outputs/inputs), we have **u'yi / v'xi** where **u** is the **M x 1** vector of output weights and **v** is the **K x 1** vector of input weights. The solution lies in estimating values for **u** and **v** such that the efficiency measure of the **i-th DMU** is maximised, subject to a constraint that all efficiency measures are less than or equal to one. This can be done using the multiplier form of linear programming as shown below:

$$\begin{aligned} & \text{Max } u, v(u'yi / v'xi), \\ & \text{Subject to } u'yj / v'xj \leq 1, j = 1, 2, \dots, N \\ & u, v \geq 0 \dots \dots \dots \text{eqn 1} \end{aligned}$$

The researcher observed that the solution to this ratio is infinite and so introduce a constraint **v'xj = 1** which changes the problem to:

$$\begin{aligned} & \text{Max } \mu, v(\mu'yi), \\ & \text{Subject to } v'xj = 1, \\ & \mu'yj - v'xj \leq 0, j = 1, 2, \dots, N \\ & \mu, v \geq 0 \dots \dots \dots \text{eqn 2} \end{aligned}$$

This form can be expressed in the envelopment form using the duality in linear programming as follows:

$$\begin{aligned} & \text{Min } \theta, \lambda \quad \theta, \\ & \text{Subject to } -yi + Y\lambda \geq 0, \end{aligned}$$

$$\begin{aligned} \theta x_i - \lambda &\geq 0, \\ \lambda &\geq 0, \dots \dots \dots \text{eqn 3} \end{aligned}$$

Where  $\theta$  is a scalar and  $\lambda$  is a  $N \times 1$  vector of constants.  $\theta$  represents the efficiency score of the  $i$ -th **DMU** and is a value  $\geq 1$ . This measures the technical efficiency (**TE**) of the **DMUs**. However, this model assumes **CRS** which means that all the **DMUs** are operating at an optimal scale. This is not the case since imperfect competition; financial constraints; environmental factors etc. may not allow **DMUs** to operate at optimal scales (Coelli et al., 2005). As a result the technical (**TE**) values will be distorted by scale efficiencies (**SE**). Banker et al. (1984) suggested an extension to the **CRS** assumption that takes into account variable returns to scale (**VRS**). This **VRS** specification breaks the **TE** in the **CRS** model into pure technical efficiency (**PTE**) and scale efficiency (**SE**), thus allowing **DMUs** of similar sizes to be benchmarked. To account for the **VRS** in the linear programming problem above, a convexity constraint  $\sum \lambda = 1$  is imposed on equation (3) giving:

$$\begin{aligned} \text{Min } \theta, \lambda & \quad \theta, \\ \text{Subject to } & \quad -y_i + Y\lambda \geq 0, \\ \theta x_i - X\lambda & \geq 0, \sum \lambda = 1 \\ \lambda & \geq 0, \dots \dots \dots \text{eqn 4} \end{aligned}$$

Where  $\mathbf{1}$  is an  $N \times 1$  vector of ones. One of the problems with the **SE** scores is that it does not show if a **DMU** is within an increasing or decreasing returns to scale area; but this can be solved by imposing a non-increasing returns to scale (**NIRS**) to the problem rather than variable returns to scale (**VRS**). The nature of the scale inefficiencies, due to either **IRS** or **DRS** can be determined by the difference between the **NIRS TE** and **VRS TE** score. If these two measures of **PTE** differ, this indicates that the **DMUs** are operating in the region of **IRS**. Conversely, if the two measures coincide, then **DRS** apply. The type of scale inefficiencies (**IRS or DRS**) for a specific **DMU** can be summarized as follows:

*If the **VRS TE**  $\neq$  Non-**IRS TE**, then the **DMU** is operating at **IRS**  
 If the **VRS TE** = Non-**IRS TE**, then the **DMU** is operating at **DRS**.*

This **VRS** specification has been used more often in academic research (Coelli et al., 2005) and is used in this study in estimating the efficiency frontier because the assumption of optimal scalability is not applicable to the banks being evaluated. In summary, we conducted this study by using both a common efficient frontier for cross country comparison; also to address for efficiency estimates bias fact due to environmental factors; a separate frontier analysis was done. This two stage approach is to Berg et al. (1993) and it seeks to establish a best practice frontier for cross country comparison against a similar standard while also taking into consideration regulatory, economic and environmental factors differences. Berger and Humphrey (1997) note that efficiency scores using single-nation frontiers will be overstated compared to efficiency scores when a common frontier is used because frontiers differ across countries. The results we obtained from the two performance measures are compared and evaluated.

## RESULTS AND DISCUSSIONS

In this section, we will analyze the empirical results obtained from the application of financial ratios and DEA to measure the impact of CSR on financial performance. The objective is to identify if CSR banks outperform Non-CSR banks.

### ***Common Frontier: US; UK; and Japan***

The results that considers hypothesis one is presented in table 1 and shows the average financial ratios and standard deviations of the pool of banks in the three sample countries as well as the results for a split of CSR and non-CSR banks. We observed that banks that incorporate CSR have better LLR/GL, LLP/NIR, IL/GL, NCO/NIBLLP, IL/E, UIL/E ratios. However the result is only statistically significant for NCO/NIBLLP ratio. Though the results are not statistically significant we can infer that sustainable banks have better asset quality. This is corroborated with the results of the liquidity ratios that show sustainable banks as been less liquid having higher NL/TA, NL/TD&B, LA/C&STF and LA/TD&B values than non sustainable banks. We therefore infer that sustainable banks are more efficient in managing their asset portfolios.

The capital ratios show that banks that do not incorporate CSR are better managed. However the only statistically significant capital adequacy ratio CF/L shows that sustainable banks have better capital adequacy. It appears that taking statistical significance into consideration sustainable banks is more efficient in managing their capital. On the other hand, a look at the profitability indicators under the operations ratios shows that non sustainable banks are more profitable than sustainable banks. However, the results are not statistically significant for most ratios. Only DPO and NOP/NI are statistically significant and sustainable banks are better off in these ratios. In table 2, the efficiency estimates are shown alongside a breakdown into pure technical of and scale efficiency estimates. It is evident that though CSR banks have significantly realized a higher efficiency level, it is functioning at a CRS of 71%. This goes to explain that the CSR banks have performed better despite the sharp fall in liquidity. In the light of the above, we reject the null hypothesis and state that:

***H<sub>1</sub>: There is a significant relationship between corporate social responsibility and financial performance***

### ***Single Frontier: Japan***

The results that considers hypothesis two is presented in table 3 and shows the average financial ratios and standard deviations of CSR and non-CSR banks in Japan. For asset quality, we observe that sustainable banks in Japan have better LLP/NIR, LLR/IL, NCO/AGL, NCO/NIBLLP, IL/E and UIL/E ratios. However the result is only statistically significant for NCO/NIBLLP ratio. This implies that non sustainable banks may have a higher problem with underperforming loans. The capital ratios indicate that banks that incorporate CSR are better managed. T1R, TCR, E/TA, E/NL, E/D&STF, E/L, CF/TA, CF/NL, CF/D&STF and CF/L all show that CSR banks outperform non-CSR banks. However, this difference is not statistically significant for any of the ratios. The profitability ratios show that sustainable banks are more profitable than banks that do not incorporate CSR. NIE/AA, PTOI/AA, NOI&T/AA -, ROAA, ROAE, INOD/AA, CIR and REP are better in sustainable banks. However, none of this difference is statistically significant and finally,

the liquidity ratios provides an unclear picture as three of the ratios indicate that sustainable banks are better while the other three indicate same for non sustainable banks. The higher efficiency of sustainable banks is not confirmed by the DEA results in table 4. The results show that sustainable banks do not have better technical and scale efficiencies as compared to non-sustainable banks. The DEA results may be explained by the fact that Japanese companies have a tradition of incorporating family values within it fabric. Conforming to Western practice from the traditional Japanese social relationships to transactional relationships appears to be a better decision for banks. This however goes to reject the null hypothesis and proves that:

***H<sub>1</sub>: Geographic location moderates the relationship between CSR and financial performance during economic contraction, such that the relationship differs across relationship and transactional banking models.***

## **CONCLUSION**

This paper looks at the performance of both banks that had incorporated CSR and those that had not based on the FTSE4Good as a CSR index. It took its sample from banks listed on the FTSE Global index and focused on Japan, UK and US as sample countries. The countries were analysed both on a separate and common frontier. The analysis was done using two methods to produce a robust evaluation of the subject. These methods included the use of financial ratios and DEA analysis. The efficiency scores both in the separate and common frontier analysis were evaluated to determine the CSR-FP link. First, we find a positive relationship between corporate social responsibility and financial performance. The results are in line with earlier studies that find a positive correlation between CSR and FP (Margolis *et al.*, 2007; Brammer *et al.*, 2006; Wu, 2006; Allouche and Laroche , 2005; Marc *et al.*, 2003; McWilliams and Siegel, 2000; Waddock and Graves, 1997; Frooman, 1997; Stanwick and Stanwick, 1998). Second, Geographic location moderates the relationship between CSR and financial performance during economic contraction, such that the relationship differs across relationship and transactional banking models. We however observed that sustainable banks in Japan performed worse than non-sustainable banks. This is in line with earlier research that during a recession Japanese banks are better off being less socially responsible (Wan *et al.*, 2008). The above findings have valuable insinuations for corporate policy makers, fund managers, investors and academic researchers as it gives empirical evidence of doing good being profitable. This will allow them to develop proper strategic initiatives that they can use to bolster their firm's position in the market. The findings can help investors to identify more profitable banks to invest in or do business with. As the frontier analysis has advantages over the traditional ratio analysis, academic researchers may find it useful to better understand performance of banks in other countries and key environmental factors affecting them; as well as scoping areas that need to be investigated to build on the analysis carried out in this paper. Other areas for future research can be how Corporate Social Responsibility affects changes in security price and transaction volumes. In addition, exploring effective investor relations and stock market returns for CSR and Non-CSR companies in Nigeria deserves additional interest.

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## Appendix 1: Tables

Table 1: Financial ratios results (%) for common frontier analysis

	All Banks		CSR Banks		Non-CSR Banks	
	Mean	S.D	Mean	S.D	Mean	S.D
<b>Asset Quality</b>						
LLR/GL	1.26	0.49	1.18	0.55	1.27	0.48
LLP/NIR	14.37	12.20	20.19	13.26	13.23	11.71
LLR/IL	111.39	139.72	77.52	65.24	118.29	149.72
IL/GL	2.38	1.89	2.35	1.50	2.39	1.96
NCO/AGL	0.49	0.55	0.60	0.40	0.47	0.58
NCO/NIBLLP	57.80	92.72	38.78	16.41	61.03	99.77
IL/E	30.82	34.25	26.22	18.15	31.72	36.56
UIL/E	29.19	25.50	20.44	10.09	31.19	27.52
<b>Capital</b>						
T1R	9.67	2.74	8.66	1.64	9.86	2.87
TCR	11.86	2.27	11.62	1.36	11.90	2.41
E/TA	7.16	3.09	6.01	2.51	7.38	3.15
E/NL	10.99	4.65	10.85	4.88	11.02	4.62
E/D&STF	8.84	4.55	7.84	3.22	9.03	4.75
E/L	7.94	3.79	6.61	3.01	8.20	3.88
CF/TA	8.52	3.45	8.09	3.29	8.61	3.49
CF/NL	13.11	5.49	15.25	6.76	12.68	5.14
CF/NL	10.64	5.28	11.28	4.66	10.52	5.40
CF/D&STF	9.47	4.29	8.94	4.02	9.58	4.36
CF/L	10.23	12.47	23.82	15.56	7.54	9.83
<b>Operations</b>						
NIR	2.42	1.08	1.92	0.93	2.52	1.09
NIR/AA	2.22	0.93	1.75	0.74	2.32	0.93
OOI/AA	0.77	0.86	0.99	1.02	0.73	0.82
NIE/AA	2.20	1.14	2.05	1.25	2.23	1.12
PTOI/AA	0.75	0.80	0.69	0.62	0.77	0.83
NOI&T/AA	-0.23	0.30	-0.15	0.23	-0.25	0.31
ROAA	0.56	0.54	0.53	0.40	0.57	0.57
ROAE	6.92	8.36	9.40	6.97	6.43	8.55
DPO	51.67	61.67	69.48	100.57	48.43	51.62
INOD/AE	2.61	7.52	4.48	4.84	2.27	7.88
NOP/NI	18.76	92.26	43.02	98.82	14.26	90.82
CIR	64.91	12.84	62.58	11.78	65.37	13.03
REP	1.09	0.78	1.07	0.72	1.09	0.79
<b>Liquidity</b>						
IR	253.46	267.36	139.85	136.68	295.12	292.34
NL/TA	66.12	10.30	57.91	12.83	67.72	8.96
NL/C&STF	83.02	50.47	78.41	27.86	83.92	53.82
NL/TD&B	73.78	11.70	66.36	13.74	75.24	10.74
LA/C&STF	11.42	8.50	14.52	14.04	10.81	6.87
LA/TD&B	10.88	7.78	13.17	11.72	10.44	6.74

Table 2: DEA results for common frontier analysis

Variable	Mean	S.D	Kurt.	Skew.	Maximum	Minimum
All Banks						
CRS	0.60	0.32	-1.51	0.02	1.00	0.08
VRS	0.68	0.31	-1.40	-0.31	1.00	0.10
SCE	0.87	0.16	0.68	-1.30	1.00	0.38
CSR Banks						
CRS	0.71	0.34	-1.25	-0.70	1.00	0.14
TE	0.73	0.34	-1.17	-0.78	1.00	0.14
SCE	0.96	0.06	2.84	-1.81	1.00	0.80
Non-CSR Banks						
CRS	0.58	0.31	-1.42	0.15	1.00	0.08
TE	0.66	0.30	-1.39	-0.23	1.00	0.10
SCE	0.86	0.17	0.07	-1.08	1.00	0.38

**CRS = technical efficiency from CRS DEA,**

**VRS = technical efficiency from VRS DEA**

**SCE = scale efficiency.**

**Table 3: Financial ratios results (%) for Japan frontier analysis**

	All Banks		FTSE4Good Banks		FTSE Index Banks	
	Mean	S.D	Mean	S.D	Mean	S.D
<b>Asset Quality</b>						
LLR/GL	1.32	0.51	1.34	0.54	1.32	0.51
LLP/NIR	15.81	10.34	14.37	11.00	16.05	10.31
LLR/IL	39.55	24.15	36.05	8.78	40.11	25.80
IL/GL	3.66	1.25	3.70	0.91	3.65	1.30
NCO/AGL	0.64	0.69	0.36	0.13	0.69	0.73
NCO/NIBLLP	98.20	117.30	47.23	13.08	106.40	124.47
IL/E	52.71	36.55	40.40	14.32	54.68	38.67
UIL/E	35.53	26.08	25.54	8.68	37.20	27.65
<b>Capital</b>						
T1R	8.88	2.21	9.81	1.76	8.73	2.25
TCR	11.11	1.71	11.66	1.33	11.02	1.76
E/TA	5.28	1.42	6.11	1.24	5.14	1.42
E/NL	8.22	2.76	9.81	2.40	7.96	2.75
E/D&STF	5.90	2.24	6.71	1.50	5.77	2.32
E/L	5.65	1.61	6.57	1.40	5.50	1.61
CF/TA	6.17	1.63	6.68	1.51	6.11	1.65
CF/NL	9.48	3.37	11.33	3.56	9.27	3.32
CF/NL	6.82	2.37	7.34	1.86	6.77	2.43
CF/D&STF	6.61	1.94	7.18	1.74	6.54	1.97
CF/L	2.84	5.68	3.83	4.64	2.73	5.82
<b>Operations</b>						
NIR	1.60	0.31	1.58	0.40	1.60	0.30
NIR/AA	1.54	0.29	1.52	0.38	1.54	0.28
OOI/AA	0.16	0.40	0.12	0.19	0.17	0.42
NIE/AA	1.41	0.28	1.28	0.28	1.43	0.27
PTOI/AA	0.29	0.44	0.37	0.37	0.28	0.46
NOI&T/AA	-0.06	0.19	-0.09	0.23	-0.06	0.19
ROAA	0.23	0.35	0.28	0.15	0.22	0.38
ROAE	3.55	8.93	4.28	2.40	3.43	9.59
DPO	36.14	33.32	26.34	9.43	37.77	35.59
INOD/AE	2.29	8.79	3.28	2.04	2.13	9.46
NOP/NI	35.79	118.73	83.69	128.44	28.09	116.48
CIR	68.50	11.77	66.96	14.94	68.75	11.31
REP	0.53	0.41	0.59	0.35	0.52	0.42
<b>Liquidity</b>						
IR	294.93	282.21	233.91	193.33	303.35	293.95
NL/TA	65.57	6.99	63.04	6.87	65.98	6.99
NL/C&STF	71.93	7.59	68.88	7.21	72.42	7.60
NL/TD&B	70.91	7.15	68.73	7.08	71.26	7.17
LA/C&STF	16.06	4.84	15.53	3.28	16.15	5.07
LA/TD&B	15.78	4.45	15.51	3.32	15.82	4.63

**Table 4: DEA results for Japan frontier analysis**

Variable	Mean	S.D	Kurt.	Skew.	Maximum	Minimum
<b>All Banks</b>						
CRS	0.81	0.20	-1.05	-0.57	1.00	0.35
VRS	0.87	0.19	0.11	-1.22	1.00	0.40
SCE	0.93	0.12	2.98	-2.02	1.00	0.57
<b>CSR Banks</b>						
CRS	0.77	0.26	-1.83	-0.50	1.00	0.40
TE	0.80	0.27	-1.70	-0.76	1.00	0.41
SCE	0.96	0.08	8.66	-2.92	1.00	0.74
<b>Non-CSR Banks</b>						
CRS	0.82	0.19	-1.04	-0.55	1.00	0.35
TE	0.88	0.17	0.29	-1.26	1.00	0.40
SCE	0.93	0.12	2.59	-1.94	1.00	0.57

**CRS = technical efficiency from CRS DEA,**

**VRS = technical efficiency from VRS DEA**

SCE = scale efficiency

## **APPENDIX 2: Description of Financial Ratios Used**

1. LLR/GL - Loan Loss Reserve / Gross Loans
2. LLP/NIR - Loan Loss Provision / Net Interest Revenue
3. LLR/IL - Loan Loss Reserve / Impaired Loans
4. IL/GL - Impaired Loans / Gross Loans,
5. NCO/AGL – Net Charge Off / Average Gross Loans
6. NCO/NIBLLP - Net Charge Off / Net Income Before Loan Loss Provision
7. IL/E - Impaired Loans / Equity
8. UIL/E - Unreserved Impaired Loans / Equity
9. T1R - Tier 1 Ratio
10. TCR - Total Capital Ratio
11. E/TA - Equity / Total Assets
12. E/NL - Equity / Net Loans
13. E/D&STF - Equity / Deposit & Short Term Funding
14. E/L - Equity / Liabilities
15. CF/TA - Capital Funds / Total Assets
16. CF/NL - Capital Funds / Net Loans
17. CF/NL - Capital Funds / Net Losses
18. CF/D&STF - Capital Funds / Deposit & Short Term Funding
19. CF/L - Capital Funds / Liabilities
20. NIR - Net Interest Revenue
21. NIR/AA - Net Interest Revenue / Average Assets
22. OOI/AA - Other Operating Income / Average Assets
23. NIE/AA - Non Interest Expense / Average Assets
24. PTOI/AA - Pre-Tax Operating Income / Average Asset
25. NOI&T/AA - Non Operating Items & Taxes / Average Assets
26. ROAA - Return on Average Assets
27. ROAE - Return on Average Equity
28. DPO - Dividend Pay-Out
29. INOD/AE - Income Net Of Distribution / Average Equity
30. NOP/NI - Non Operating Profit / Net Income
31. CIR - Cost to Income Ratio
32. REP - Recurring Earning Power
33. IR - Interbank Ratio
34. NL/TA - Net Loans / Total Assets
35. NL/C&STF - Net Loans / Customer & Short Term Funding
36. NL/TD&B - Net Loans / Total Deposits & Borrowing
37. LA/ C&STF - Liquid Assets / Customer & Short Term Funding
38. LA/TD&B - Liquid Assets / Total Deposit & Borrowing.