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The Cost of Corporate Social Responsibility: The Case of the Community Reinvestment Act

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**The Cost of Corporate Social Responsibility: The Case of the Community
Reinvestment Act**

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Abstract: A Data Envelopment Analysis (DEA) cost minimization model is employed to estimate the cost to thrift institutions of achieving a rating of 'Outstanding' under the anti-redlining Community Reinvestment Act, which is viewed as an act of *voluntary* Corporate Social Responsibility (CSR). There is no difference in overall cost efficiency between 'Outstanding' and minimally compliant 'Satisfactory' thrifts. However, the sources of cost *inefficiency* do differ, and an 'Outstanding' rating involves annual extra cost of \$7.4 million or, 1.3% of total costs. This added cost is the shadow price of CSR since it is not an explicit output or input in the DEA cost model. Before and After-tax rates of return are the same for the 'Outstanding' and 'Satisfactory' thrifts, which implies a recoupment of the extra cost. The findings are consistent with CSR as a management choice based on balancing marginal cost and marginal revenue. An incidental finding is that larger thrifts are less efficient.

JEL Codes: M14, Social Responsibility; G28, Financial Institutions (Government Policy and Regulation); D21, Firm Behavior.

Keywords: Corporate Social Responsibility, Community Reinvestment Act, Data Envelopment Analysis, Cost Efficiency.

The Cost of Corporate Social Responsibility: The Case of the Community Reinvestment Act

Are firms that behave in a ‘socially responsible’ manner more or less efficient than firms that ‘mind their own business’ and remain focused on maximizing shareholder wealth? Among the difficulties facing the researcher seeking an answer to this question is how to define Corporate Social Responsibility (CSR), and what is meant by the term ‘efficient.’ This paper is unique in employing a readymade, quantified definition of CSR used by bank regulators in the United States to assess the performance of depository institutions in complying with anti-discrimination legislation. Each bank is assigned a rating by regulatory examiners for its performance in extending credit to low income and minority neighborhoods. Banks must achieve a minimal rating of ‘Satisfactory’ but can choose to go beyond that and be rated ‘Outstanding.’ The latter represents an instance of *voluntary* CSR. Beyond the question of finding a suitable index of CSR, is the issue of how to determine if firms sacrifice efficiency or profit if they are more socially responsible? This paper employs the method of Data Envelopment Analysis (DEA) that uses mathematical programming to determine the best practice frontier for cost minimization as a means of addressing the efficiency tradeoff issue.

Our results for a sample of large, urban thrift institutions is that ‘Outstanding’ thrifts are just as cost efficient as minimally compliant ‘Satisfactory’ thrifts, and rates of return on equity capital are also the same. But the annual incremental cost of an ‘Outstanding’ CSR is \$7.4 million.

The Community Reinvestment Act

The Community Reinvestment Act (CRA) of 1977 requires the Office of Thrift Supervision (OTS) to use its authority when examining savings associations subject to its jurisdiction to assess the institution's record of meeting the credit needs of its entire community, including low- and moderate-income neighborhoods, consistent with safe and sound operation.¹ Upon conclusion of such examination, the OTS must prepare a written, publicly available, evaluation of the savings association's record of meeting the credit needs of its community. The OTS evaluates performance in the geographic assessment area(s) defined by the savings association. The current examination procedures for large savings associations (institutions with assets greater than \$250 million) became mandatory for all examinations conducted on or after July 1, 1997.² A brief review of publicly available CRA reports suggests that examiners focus upon the proportion of home mortgage loans made by the institution in low and moderate income neighborhoods within its assessment area relative to the proportion of low and moderate-income owner occupied housing units in those neighborhoods. Examiners also consider the number of low and moderate-income borrowers, irrespective of neighborhood of residence, relative to the assessment area totals. Comparisons are also made with national patterns of borrowing.³ Thomas (2002) claims that the proportion of 'Outstanding' CRA lenders peaked at 27% in 1996 and declined to only about 10% nationwide in 2001. Similarly, Dahl, Evanoff and Spivey (2003) examined 3819 commercial banks covering 1990-1996 and report over 80% rated as 'Satisfactory' and only 12% 'Outstanding.' The present paper uses a sample of thrifts of which 28% are 'Outstanding.'

In spite of the controversy surrounding the Community Reinvestment Act, little rigorous research has been devoted to determining the cost of complying with this landmark piece of social legislation. One industry trade group conducted a mail survey and estimated large bank personnel costs of \$115,000 per year to comply with CRA [Independent Community Bankers of America (2002)]. Thakor and Beltz (1993) also collected CRA compliance cost data from a mail survey of 445 banks with mean assets of \$315 million. They regressed those costs against bank size and area population and concluded that the cost of achieving CRA 'Outstanding' is equal to 0.25% of assets (ibid. Table 2), a figure more than twice as high as the estimate arrived at here.

More than 50 studies of the efficiency of U.S. financial institutions have been published, and as best as can be determined none has employed the methodology of frontier analysis to the specific issue of CRA cost. This is surprising because frontier analysis makes it possible to determine the overall efficiency and ranking of firms in an objective manner, which makes it particularly valuable in assessing and informing government policy regarding financial institutions [Berger and Humphrey (1997), 176]. Because legislation was deemed necessary in order to compel depository institutions to make affirmative efforts to extend credit to low and moderate income neighborhoods, it seems reasonable to view the effect of CRA on bank operations as imposing a constraint on their lending behavior. To comply with CRA, the banks' portfolio of mortgage loans must contain a higher proportion of more costly loans than the banks would prefer. Lending to low and moderate-income borrowers is more costly because it involves outreach efforts to attract enough such borrowers to satisfy regulators. And more resources are needed to screen and evaluate the credit history of lower income applicants,

who may have uneven employment records and prior credit difficulties. Greater efforts at collection and monitoring of loans may be also needed. One way to recoup these higher costs is to charge higher interest rates and fees to low income borrowers, but fear of charges of bias make it unlikely that banks would charge more to customers subject to CRA.⁴ As compared to its peers with similar volumes of 1-4 family home mortgage lending and input prices, a savings bank or savings and loan with more CRA eligible loans will likely have higher costs. On the other hand, superior management or scale economies might offset the higher costs of CRA. In effect, more efficient banks may use up some or all of their cost advantage by behaving in a more socially responsible manner. The degree to which the cost structure of competing banks can diverge will depend upon the strength of market competition. Under perfect competition, firms with higher costs will have difficulty surviving unless consumers are prepared to pay a premium for socially responsible behavior.

Defining Corporate Social Responsibility

The decision by the management of a firm to take *voluntary* actions, beyond what is required by law, to further some social agenda has come to be known as Corporate Social Responsibility [McWilliams and Siegel (2001)]. This is different from the idea that managers should broaden their objective function to include goals beyond maximization of shareholder wealth by taking into account the interests of other ‘stakeholder’ groups. An illustration of CSR is the manufacturer of brand name sporting apparel that takes action to monitor labor conditions in Third World factories where its products are made because of adverse publicity about ‘sweatshop’ conditions, and it

believes it can recoup any resulting increase in production or monitoring costs through higher prices. In the case of the Community Reinvestment Act, about eighty percent of depository institutions subject to CRA choose only a 'Satisfactory' rating. An obvious cause of this low incidence of CSR is that most lenders view the cost as outweighing the benefit.⁵ McWilliams and Siegel (op.cit.) note that so-called Search Goods, whose attributes are readily identified prior to purchase, are less likely to be subject to CSR pressures. This is so because buyers are less willing to pay for reputation when they can directly evaluate the good or service. Indeed, the low incidence of Outstanding CRA rating suggests that the original description of lending as an Experience Good, which is the basis of the market failure theory of anti-redlining legislation, may be erroneous. Alternately, the private cost of achieving an 'Outstanding' rating may be too high, even if mortgage lending is correctly viewed as an Experience Good. Existing evidence suggests that, in addition to patterns of lending activity, bigger banks and banks that are part of a holding company are more likely to receive an 'Outstanding' CRA rating from regulators [see Dahl, et.al. (2003) and the several studied therein cited]. Since the main CRA enforcement mechanism is adverse publicity and the potential delay or denial of proposed mergers, these findings are quite plausible. A larger institution is more visible and its reputation more vulnerable to public criticism; and holding companies are likely to be more active in making mergers and acquisitions.

In order to try and disentangle the various effects and motivations behind CRA and CSR, the mathematical programming technique Data Envelopment Analysis (DEA) is employed. The model is input oriented cost minimization to determine the cost efficiency, relative to observed best practice, of 137 savings banks and savings and loan

associations, usually referred to as thrifts, with assets of \$250 million or more in 1998. Of these, 98 are rated 'Satisfactory' by the Office of Thrift Supervision, and 39 are 'Outstanding.'⁶ The most straightforward way to analyze their efficiency is by using a second step regression. Coelli, Rao and Battese (1998) review the available alternate methods for incorporating auxiliary variables in DEA and conclude that this 'two-step' approach in which the efficiency results are regressed against variables meant to 'explain' efficiency is preferred because it is transparent, amenable to tests of significance, is multivariate and readily accepts categorical variables (ibid. 171). In the present study we identify four observable factors that can influence the cost efficiency of a savings bank: CSR/CRA, the degree of market competition, mutual versus stock form of ownership, and economies and diseconomies of scale.

Our maintained hypothesis is that CRS is an implicit output not amenable to direct cardinal measurement because of its categorical nature. The recent literature on CRA assumes that it causes lenders to alter the mix of home mortgage loans, rather than change the volume of mortgage lending [Joint Center for Housing Studies (2002)]. Thus when comparing two otherwise identical thrifts with the same volume of home mortgage lending, the one with a greater proportion of CRA-eligible loans will incur higher costs. Since CRS is an omitted output, any added cost should reveal itself as inefficiency. This inefficiency is the shadow price of Corporate Social Responsibility.

CRA regulations afford considerable discretion to regulators, so a more consistent set of assessments is likely to be found within a single regulatory agency.⁷ All the institutions examined here fall under the jurisdiction of the Office of Thrift Supervision (OTS). Depending upon their Charter, other types of banks are examined for CRA

compliance by the Federal Reserve, The Federal Deposit Insurance Corporation or the Comptroller of the Currency. And the minimum frequency of CRA examinations for large banks depends on the previous rating received: Outstanding banks are to be examined at least every three years, Satisfactory banks at least every two years, and Needs to Improve or Substantial Non-compliance requires an examination at least once a year. Our data uses the most recent rating of each thrift institution as of December 1998.

Related Studies About Bank Efficiency

Of the numerous efficiency studies of banks in the United States that have been published, the bulk of them deal with commercial banks [Berger and Humphrey, *op. cit.*]. Only three studies have focused on the savings and loan industry. Two of these used stochastic frontier analysis (SFA) and estimated efficiency in the range of .73 to .92 [Cebenoyan, *et. al.* (1993); Mester (1993)]. Hermalin and Wallace (1994) used Data Envelopment Analysis and found mean cost efficiency of about .75 for the thrift industry in 1986-87.⁸

The Model

The savings bank industry is modeled along the lines of the ‘intermediation’ approach towards financial institutions [Berger and Humphrey (1997)]. This model views financial institutions primarily as conduits between savers, who supply deposits, and investors or consumers who borrow them. Inputs to this process give rise to either explicit or implicit costs to the bank. Four inputs are identified: loanable funds (primarily deposits), equity capital, labor, and office capital (i.e., premises and equipment). The thrifts use these inputs to produce three desirable outputs: mortgage loans, non-mortgage

loans, and investments plus one undesirable output, loan risk. Following Cooper, Seiford and Tone (2000), we transform loan risk so that less risk represents greater output.⁹ Consistent with the intermediation approach, these outputs yield revenue to the firm. The intermediation model mirrors the familiar 'T' account model of banking used to explain the process of money creation. Assets are loans and investments, here treated as outputs; liabilities, mostly deposits, and equity plus physical capital are inputs. The alternate 'production' model of banking views the financial services industry as producing a variety of transactions, such as checking accounts, passbook accounts, credit reports and loan applications. Inputs are labor and office capital. This model is perhaps most suitable for analyzing activities *within* a firm, such as branch offices, whereas the intermediation model is more suitable to describing an entire firm, which is the subject of this paper [Berger and Humphrey, op. cit.].

Because we seek an estimate of the least cost of producing each bank's observed level of outputs, it is necessary to provide unit prices for each of the four inputs. This paper is unique in using a firm specific estimate of the implicit opportunity cost of equity capital, analogous to the Capital Asset Pricing Model.¹⁰ The estimated risk adjusted cost of equity capital starts with the risk free rate of return on U.S. Treasury Bonds, which is 5.1% in 1998. To this is added an equity risk premium of 2.5%, which is adjusted up or down based on three risk factors: bank size, loan delinquency and coverage of net loan charge-offs. For example, a savings and loan with assets over \$1 billion, moderate loan delinquency and low coverage of charge-offs has an estimated cost of capital of 7.8% = 5.1% + 1.08(2.5%). This cost of capital data is available from a bank rating service, IDC Financial (1998). One consequence of imputing a cost of equity capital is that our

estimate of bank costs exceeds that found in published Thrift Financial Reports compiled by the Office of Thrift Supervision, which count only explicit costs. The resulting estimate of CSR/CRA cost is therefore a better approximation of the social opportunity cost. The most important input price is the cost of loanable funds, which is defined as interest expense divided by net bank debt.¹¹ Unit labor cost is simply average compensation per full-time equivalent employee. The fourth input price is the ratio of office expenses to the book value of premises and equipment capital.

Data Envelopment Analysis

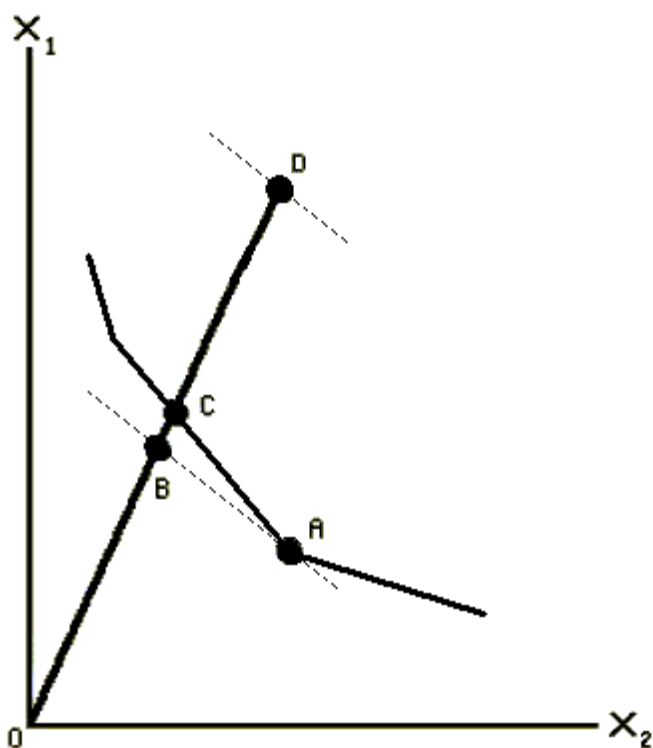
Minimizing the cost of output is the DEA model that we employ [Zhu (2003), 282]:

$$\begin{aligned}
 & \min \sum_{i=1}^m p_i^o \tilde{x}_{io} \\
 & \text{subject to} \\
 & \sum_{j=1}^n \lambda_j x_{ij} \leq \tilde{x}_{io} \quad i = 1, 2, \dots, m; \\
 & \sum_{j=1}^n \lambda_j y_{rj} \geq y_{ro} \quad r = 1, 2, \dots, s; \\
 & \lambda_j, \tilde{x}_{io} \geq 0 \\
 & \sum_{j=1}^n \lambda_j = 1
 \end{aligned}$$

Each of n Decision Making Units or DMUs employs inputs x_i to produce y_r outputs. The unit price of each input is denoted p_i . The observed DMU is denoted with the subscript o . In the present case, $n = 137$ thrifts. Inputs $m = 4$: Loanable Funds, Equity

Capital, Labor and Office Capital. Outputs $s = 4$: mortgage loans, non-mortgage loans, investments, and inverted loan risk. This is a non-radial, input oriented BCC Variable Returns to Scale model. There are zero input and output slacks because DMUs are able to adjust inputs in a non-proportional manner. Returns to scale was judged to be variable using the procedure in Zhu (ibid.) which placed all thrifts in the sample in the region of either increasing, constant or decreasing returns to scale (op.cit. 269). Thus the model determines the least cost mix of inputs needed to produce the observed output mix of each DMU, given its set of input prices, based on the best practices of the reference set. The cost efficiency of DMU o is defined as $E_c = \sum p_{io} x_{io}^* / \sum p_{io} x_{io} \leq 1$, which is the ratio of the minimum cost of inputs to the actual cost of inputs when λ^* and x^* are the optimal solution values of the programming model; and dollar cost inefficiency is defined by $\sum p_{io} x_{io} - \sum p_{io} x_{io}^* \geq 0$, with the summation over the i inputs. The DEA analysis determines the minimum cost necessary to produce each DMU's observed output. Ratio cost efficiency (E_c) is composed of technical efficiency (TE) and allocative efficiency (AE): $E_c = TE \cdot AE$ [Coelli, et.al. (1998), 162]. Figure 1 illustrates TE and AE for the two input case.

Figure 1.



The observed input combination is at point D, with the corresponding isocost line shown as a dashed line through point D. The slope of the isocost line reflects the relative prices of the two inputs. This firm is both technically and allocatively inefficient. $TE = OC/OD$, and $AE = OB/OC$, and $E_c = OC/OD \cdot OB/OC = OB/OD \leq 1$. Technical efficiency measures the radial distance from the observed input combination to the piecewise linear isoquant that corresponds to the observed level of output. Thus TE measures the potential for cost reduction by reducing all inputs by the proportion OC/OD and still producing the same output. AE measures the potential for reducing observed cost by adjusting the mix of inputs along the same isoquant in order to satisfy the familiar least cost condition of

equating the ratio of input price to input marginal product for all inputs. CSR/CRA may cause either TE or AE.

DEA Results

The mean cost efficiency score $E_c = .88$ (s.d. = .10), higher than reported by Hermalin and Wallace (op.cit.).¹² The improved efficiency is possibly due to the restructuring of the thrift industry following the crisis of the 1980's. Thirty of the 137 thrifts are fully cost efficient with $E_c = 1$, but only six of these are also CRA 'Outstanding.' The non-parametric Wilcoxon-Mann-Whitney Rank Sum Test of the hypothesis that the efficiency scores of the 'Outstanding' and 'Satisfactory' thrifts is drawn from the same population distribution is not rejected [Walker and Lev (1953), 434].¹³ This result is robust to the alternative strategy of fitting separate cost frontiers to the 39 'Outstanding' and 98 'Satisfactory' thrifts. Apparently, CSR thrifts are not disadvantaged in terms of their ratio cost efficiency.

Estimating the Cost of Corporate Social Responsibility

The working hypothesis of this paper is that the Community Reinvestment Act constrains the thrift industry to incur higher costs to produce any particular set of outputs, especially 1-4 family home mortgage loans, and that this reveals itself as cost inefficiency because CSR is not an explicit output or input.

The sources of the approximately 13% inefficiency detected can vary systematically between the two groups of thrifts. For example, the comparison may be confounded by scale efficiency differences since mean assets of the 98 'Satisfactory'

thrifts is only \$1.5 billion, versus \$7.8 billion for the 39 rated ‘Outstanding.’¹⁴

Differences in market structure or type of ownership could also vary systematically between the two groups. The usual approach to the econometric analysis of DEA efficiency is a Tobit specification since there will be a cluster of zero values for the dependent variable corresponding to the fully efficient firms, using either E_c or dollar cost inefficiency. Cragg (1971) proposed a more general model that separates the effect of an explanatory variable on the probability of being a nonzero observation from the magnitude of its effect. The Tobit model constrains the two effects to be identical. Cragg’s model is a two-part probit/truncated regression within which the Tobit is nested as a special case. A likelihood ratio test rejects the Tobit specification in favor of the two-part probit/truncated model, but the estimated cost of CSR is *not* sensitive to the choice of the Cragg versus the Tobit specification.¹⁵

The dependent variable in the probit equation in Table 1 is a binary indicator that equals 1 if the thrift is inefficient, 0 if fully efficient. The dependent variable in the truncated regression is the dollar cost of inefficiency because the aim is to place a shadow price on Corporate Social Responsibility. The Cragg model employs the same set of explanatory variables in both equations. The CRA Outstanding is an indicator variable, 1 if the bank is rated ‘Outstanding’, 0 if ‘Satisfactory’ (29% are ‘Outstanding’). Stock is an indicator variable for ownership type, 1 if a stock form of organization, 0 if a mutual bank (83% are stock). The competitive environment is measured by the Herfindahl index of deposit market share in the metropolitan statistical area in which the bank’s assessment area is located, based on Federal Deposit Insurance Corporation statistics on deposits. The mean Herfindahl index is .11 (s.d. = .045). Higher values indicate a more

concentrated, less competitive market. The U.S. Department of Justice merger guidelines and a leading textbook in industrial organization characterize a Herfindahl index below .2 as perfectly competitive [See Viscusi, Vernon and Harrington (1995), 214; and Besanko, et. al. (2004), 207].¹⁶ In order to separate out scale inefficiency a DEA Variable Returns to Scale production frontier (input oriented) is fitted using the same inputs and outputs as the cost minimization problem (those results are available from the authors). A thrift operating in the region of constant returns to scale cannot reduce costs by adjusting its size. But if a thrift is operating in the region of increasing or decreasing returns to scale, it is scale inefficient—which is part of technical inefficiency in the cost model and should be controlled for in estimating the cost of CSR/CRA. Two indicator variables describe returns to scale. IRTS is 1 if the bank is in the region of increasing returns, 0 otherwise. DRTS is 1 if the bank is in the region of decreasing returns, 0 otherwise. Thus the default is constant returns to scale.¹⁷

Table 1
Probit/Truncated Regression Analysis of Thrift Inefficiency
(t – ratios in parentheses)

<i>Variable</i>	<i>Probit Coefficient</i>	<i>Truncated Marginal Effect</i>
Constant	-.2944	-23125*
	(-.520)	(-3.98)
CRA Outstanding (= 1)	.4262	7423*
	(1.34)	(2.67)
Stock Bank (=1)	.0793	4951
	(.222)	(1.37)
Herfindahl Index	.7724	7278
	(.222)	(.317)
Increasing Returns to Scale	7.65	2269
	(.000)	(.438)
Decreasing Returns to Scale	1.150*	9316*
	(4.204)	(2.28)
Log likelihood function	-55.62	-1114.8
Number of Observations	135	105

† In thousands. * = Significant at 95% or better.

The insignificant CRA Outstanding in the probit equation, which is consistent with the Wilcoxon Test, suggests that being 'Outstanding' does not increase the probability of a thrift being cost inefficient; but given that it is inefficient CSR/CRA does result in cost inefficiency. The truncated model's marginal effect, estimated at the means of the other variables, is the primary focus. The marginal cost of achieving an 'Outstanding' level of corporate social responsibility is \$7.4 million per year.¹⁸ When compared to the mean actual cost per 'Outstanding' bank of \$550 million, the incremental cost is 1.3% of total cost. Mean cost inefficiency is \$15.8 million, so CSR represents a significant proportion thereof. As compared to the mean assets of the 39 'Outstanding' thrifts, the CRA cost is less than 0.1%, less than half the 0.25% estimated by Thakor and Beltz (op.cit.).¹⁹

The Herfindahl index variable has the expected positive sign, i.e, less competition implies greater inefficiency, but it is not significant. This may be because 131 of the thrifts operate in metropolitan areas with $HI < .2$. And, in contrast to Mester (op.cit), we find no difference in efficiency between Stock and Mutual thrifts. The steady number of mutual conversions over the years may have left only the most efficient mutuals in the marketplace. Only the decreasing returns to scale variable has a significant effect on the probability of a thrift being cost inefficient in the probit, and the magnitude of that effect is large and also significant in the truncated regression. Given the ongoing rush to consolidate in the banking industry, this is a provocative finding. Bigger is not more efficient. Perhaps banks expect increased market power to offset any resulting diseconomies of scale.

One implication of the McWilliams and Siegel hypothesis about Corporate Social Responsibility is that profit rates should be the same between ‘Outstanding’ and ‘Satisfactory’ thrifts because discretionary CSR is expected to generate marginal revenue equal to its marginal cost. And the late Senator Proxmire of Wisconsin, who authored the CRA legislation, maintained that its expected negative impact on bank profits was a fair tradeoff for other government policies that favor banks, such as deposit insurance, entry barriers, etc. To test this hypothesis we (separately) regress the before tax and after tax rates of return on equity on the CRA indicator variable. The coefficient on the CRA variable is highly insignificant in either case.²⁰ Without estimation of a fully specified profit function, this result is only suggestive. Yet it is consistent with the view that CSR does not impair financial performance and firms may recoup the costs of CSR.

Conclusion

A sample of large urban saving associations are analyzed using Data Envelopment Analysis in order to assess the cost of achieving an ‘Outstanding’ rating from bank regulators in making home mortgage loans in low and moderate income neighborhoods. Cost efficiency is found to be the same between ‘Outstanding’ and minimally compliant institutions when no explicit account is taken of this unpriced output. But further econometric analysis estimates the implicit or shadow price of this example of voluntary Corporate Social Responsibility at \$7.4 million per year per thrift. The magnitude of this cost is consistent with the fact that the overwhelming majority of depository institutions attain only the minimally passing ‘Satisfactory’ rating. The results are consistent with the hypothesis that the management of a firm weighs expected

benefits against costs when choosing to behave in a ‘socially responsible’ manner—a conclusion reinforced by evidence that profit rates are invariant between ‘Outstanding’ and ‘Satisfactory’ saving associations.

Data Appendix

Descriptive Statistics of DEA Variables
(Means, \$ amounts in thousands, rounded)
Satisfactory Thrifts (n = 98) Outstanding Thrifts (n = 39)

INPUTS

Funds	\$1,338,000	\$6,930,000
Equity	\$126,000	\$568,000
Labor (number)	375	1227
Office Capital	\$16,050	\$72,058

OUTPUTS

Mortgage Loans	\$934,383	\$4,588,000
Non-Mortgage Loans	\$152,562	\$522,465
Investments	\$326,737	\$2,124,000
Inverted Risk	3.38	3.33

INPUT PRICES

Price of Funds	0.05	0.05
Equity Capital	0.073	0.071
Wage Rate	\$43,230	\$43,137
Office Capital	0.50	0.41
TOTAL COST	\$98,540	\$550,500

Data Sample

The 137 large urban savings banks and savings and loans analyzed in this paper are drawn from an OTS population of 305 thrifts with assets of \$250 million or more.

The percentage distribution of the sample by OTS defined asset categories is as follows, with the OTS population distribution in parentheses [OTS (2002)]:

\$250m to < \$500	33%	(45%)
\$500m to <\$1 bil.	23%	(23%)
\$1 bil. to <\$5 bil.	32%	(24%)
Over \$5 bil.	12%	(8%)

Our sample over weights the largest thrifts, which is appropriate since they are fewer in absolute numbers and because CRA ‘Outstanding’ is more common among the biggest thrifts. The OTS population includes non-urban institutions. Thrifts belonging to a holding company with assets in excess of \$1 billion are treated as ‘large’ for purposes of CRA, even if its assets fall below the \$250 million threshold. None of the banks in this data set are in that category.

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Endnotes

¹ All FDIC insured depository institutions are subject to CRA. Each is examined for CRA compliance by the regulatory agency under whose jurisdiction it falls. Credit Unions and independent mortgage companies are not subject to CRA. OTS regulates all federally chartered and many state chartered thrifts.

² The large bank CRA examination consists of a lending test, an investment test and a service test. The institution is rated Outstanding, Satisfactory, Needs to Improve or Substantial Noncompliance in each category, which maps into an overall CRA rating. The size category 'large' includes institutions belonging to a bank holding company with assets over \$1 billion, regardless of its own assets. The examination procedures put in effect July 1, 1997 emphasize flexibility and are meant to focus on outcomes rather than rigid rules and ratios in order to minimize the regulatory burden.

³ Some critics have charged that CRA ratings are too subjective. But Dahl, et.al (2003) provide evidence that the scheduling of CRA exams and grading by regulators is significantly related to objective factors such as the volume of residential lending during the period 1990-1996.

⁴ The theoretical case for CRA-type regulations is asymmetric information: the potential borrower has better information about his credit risk than the lender. This may lead to adverse selection and credit rationing. But this outcome is contingent upon banks charging higher interest rates in response to imperfect information. If fears of bias override the concerns about information, banks may not raise rates and

therefore not cause credit worthy borrowers to drop out of the market. There is widespread belief in financial markets that modern computerized data bases have largely eliminated asymmetric information.

⁵ The above cited industry estimate of \$115,000 to comply with CRA is difficult to reconcile with such a low incidence of Outstanding performance. Either banks view the benefits of CRA Outstanding, e.g. enhanced reputation, as trivial or, the compliance cost is much more significant—which is what we find.

⁶ This is a significantly higher proportion of outstanding banks than is typical. For example, Dahl et.al. (op.cit) find that only 11% of commercial banks were rated Outstanding and 81% rated Satisfactory. Originally, our data set contained 140 large urban banks, 3 of which were rated Needs to Improve. These were dropped as being too few upon which to base any significant conclusions.

⁷ In response to charges that CRA ratings are too subjective more explicit examination guidelines were promulgated, effective July 1, 1997 for large banks. Since rating can persist for up to three years between examinations, some of those used here may straddle the changeover. However, Dahl, et.al (2003) econometrically assessed the CRA examination of 3819 commercial banks during 1990-1996, which predates the new regime. They concluded that the timing of exams and decisions about grade changes was significantly related to objective criteria such as loan activity, bank size and affiliation.

⁸ Efficiency of .75 means that firms could reduce their inputs to three-fourths of existing amounts without reducing observed output. Alternately, they are using 33 per cent more inputs than necessary: $(1-.75)/.75 = .33$.

⁹ Loan risk is net loan charge-offs as a percent of gross loans as an annual rate for the period 1996-98 (Savings & Loans/Savings Bank Financial Quarterly, 1998). These ranged from -0.11% to 3.57%. Each loan risk value is transformed by multiplying by “-1” and adding 3.57. Only two observations had negative loan risk. The transformed risk variable now ranges from 0 (the highest risk) to 3.68 (the lowest risk). The input oriented VRS model is invariant to output (but not input) translation. See Cooper, Seiford and Tone (2000), 94 and 228, and Zhu (2003), 107.

¹⁰ Hermalin and Wallace (op. cit.) use the six-month Treasury Bill rate to proxy the cost of equity capital and a set of inputs similar to those used here.

¹¹ Net bank debt is defined as loans and investments minus equity capital and loan loss reserves. This piece of data is also purchased from IDC Financial. All the other input and output data is from OTS reports.

¹² $E_c = .88$ implies that actual cost is .136 above least cost: $(1-.88)/.88 = .136$.

¹³ The z test statistic is 1.13 as compared the critical value of 1.96 (95%, two tailed test).

¹⁴ Mester (1993) estimated RTS of the order of 1.01 to 1.02 for the savings and loan industry using stochastic frontier analysis. These are summary values estimated at the means of output levels and input prices. Given the fivefold difference in the average size of outstanding versus satisfactory thrifts in the present paper, even very modest returns to scale could confer a nontrivial cost advantage.

¹⁵ The likelihood ratio test statistic is computed as $\lambda = -2[\log L_T - (\log L_P + \log L_{TR})]$, where $\log L_T$ is the likelihood ratio of the Tobit model with the same coefficients, $\log L_P$ is the likelihood ratio of the probit and $\log L_{TR}$ is the likelihood ratio of the truncated regression. $\lambda = -2[-1226.3 - (-55.6 - 1114.8)] = 111.2$. The critical value is 11.07 (Chi-Square, .95 (df = 5), so the tobit model with identical coefficients is clearly rejected. [See Greene (2000), 915].

¹⁶ The Herfindahl index is defined as the sum of the squared market shares (S_i) of each firm, $HI = \sum(S_i)^2$, summed over i firms. Since market shares are expressed as decimals, a pure monopoly corresponds to $HI = 1$. In the second step regression, 131 of 135 banks are located in metropolitan areas with $HI < .20$. Two observations had to be dropped because it was not possible to identify them in the FDIC data. They may have changed names, merged or gone out of business.

¹⁷ An input oriented RTS measure is used with Zhu's method of determining each DMU's RTS, which is invariant to the existence of multiple optimal solutions (op. cit., 65-66).

¹⁸ The marginal effect measures the change in the expected value of the dependent variable from going from $CRA = 0$ to $CRA = 1$, holding all other variables at their mean values.

¹⁹ The Harvard Joint Center for Housing Studies (2002) estimates that CRA increases the proportion of CRA eligible 1-4 family home mortgage loans made by banks by 7%, from 30.3% to 32.4% of loans (ibid., Exhibit 21). The 39 Outstanding banks in the present study made an average of 3107 mortgage loans in 1998. This implies 65 more loans are made to CRA eligible borrowers than would otherwise occur. The \$7.4 million estimated cost of an 'Outstanding' rating means a cost per extra loan of at least \$114,000.

This is a lower bound estimate of CSR because the Joint Center does not distinguish between Satisfactory and Outstanding CRA performance.

²⁰ ROE = 11.66 + 0.407(CRA); AfterTax ROE = 11.11 + 0.540(CRA). ROE data from IDC(1998).
(t=13.35) (t=.25) (t=14.68) (t=.38)