Subtitle C and D Corporate Financial Test
Issue Paper
Performance of the Financial Test as a Predictor of Bankruptcy

Introduction

Commenters on the proposed corporate financial test questioned the test's ability to predict a firm's impending bankruptcy. Related issues included:

- The test's performance in predicting a firm's failure several years in the future; and

- The capability of a rating on a single bond to measure the likelihood that a firm will fully cover its closure and post-closure care obligations.

This paper addresses each of these issues based on additional analysis of data cited in the background documents to the proposed Subtitle C and D tests. In particular, data from 1987 bankrupt firm sample are referenced in regard to misprediction rates. Further information was obtained from bond rating agency publications and the agencies themselves.

Our research yielded the following key findings:

- While not infallible, the proposed financial test carries very little assurance risk; and

- Conservative assumptions made during the evaluation of candidate tests helped to bolster the strength of the test as a financial assurance mechanism.

The remainder of this paper is organized into three sections. A discussion of the assurance risk associated with the proposed test is presented in Section 1. Section 2 then examines the assumptions made in the development of the test which contribute to its effectiveness. Specifically, this section analyzes the test's assumptions regarding: a) the recovery rate of obligations owed by bankrupt firms, and b) the ability of firms to obtain alternative financial assurance mechanisms upon failing the financial test. Section 3 examines the reliability of bond ratings as predictors of overall financial health.

1. Strength of the Test as a Financial Assurance Mechanism

The Agency does not dispute the contentions of commenters who assert that the proposed test cannot predict decades into the future. In fact, in the background document to the revised Subtitle C financial test, the Agency states,

> "Any financial test involves a tradeoff between availability to viable firms and ability to screen out bankrupt firms. The easier a financial test is to pass, the more available the test will be to viable firms. At the same time, however, the easier the test is to pass, the less discriminating the test is at screening out bankrupt firms. Conversely, a more stringent test will more accurately screen

out bankrupt firms from using the test, but will also be less available to viable firms."[1]

This tradeoff is expressed in terms of public and private costs. Private costs refer to the expense incurred by viable firms to obtain alternative financial assurance mechanisms when they fail a financial test. Public costs are the funds expended by the government to cover financial assurance obligations of bankrupt firms that passed the financial test and later defaulted on their obligations. In developing the financial test, the Agency strived to create a test with both low public and private costs.

Although no test is perfect in discriminating between viable and bankrupt firms, the proposed corporate financial test is a very low-risk form of financial assurance.[2] The proposed test's minimum size requirement ($10 million in tangible net worth plus the costs the owner/operator seeks to assure) serves as an effective initial screen for bankrupt firms. Previous research conducted by the Agency revealed that firms with less than $10 million in tangible net worth went bankrupt four times more frequently than firms with tangible net worth greater than $10 million.[3] The proposed test is then reinforced by financial ratios and bond rating requirements which have also been shown to be effective measures of a firm's financial health.[4]

The effectiveness of the proposed corporate financial test as a financial assurance mechanism can also be shown numerically using calculations of assurance risk. Assurance risk measures the percentage of firms that are able to use the financial test for financial assurance and subsequently go bankrupt. This figure is calculated by multiplying the firm failure rate for the industry by the misprediction rate of the proposed test. The Agency has defined misprediction rate as the percentage of bankrupt firms that pass the financial test in any of the three years prior to their declaration of bankruptcy.[5] Assurance risk, broken down

---

[1] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage, p. 4-3.

[2] This issue paper will, at times, refer explicitly to either the Subtitle C or D financial test. It should be noted that, unless otherwise stated, all such discussions apply to both tests, given that the Subtitle D test is identical to the Subtitle C test.

[3] Federal Register, vol. 59, no. 196, October 12, 1994, p. 51524.

[4] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage, pp. 4-28 - 4-31. The effectiveness of a financial ratio can be considered in terms of the difference between its availability and misprediction rates. Large differences between these rates (i.e., high availability and low misprediction) indicates that the ratio accurately accepts viable firms and rejects firms prone to bankruptcy. The differences for the selected profitability and leverage ratios were 54.1 percent and 37.1 percent, respectively. These differences were notably higher than those for most other proposed ratios.

[5] A three year time period was selected because the ability of a firm to acquire alternative financial assurance this close to bankruptcy is questionable.

by net worth categories, was calculated for both financial tests.[6] Both test's assurance risk ranged from 0.233 to 1.067 percent This information is presented in Exhibit 1 below.

Exhibit 1
Failure Rates and Assurance Risks By Net Worth Categories[7]

Net Worth ($ million)	A Failure Rate (%)	B Bankrupt Firm Misprediction Rate	A X B Financial Test Risk
1 - 10	1.6	0.667	1.067
10 - 20	1.5	0.429	0.644
20 - 100	1.1	0.300	0.330
100 +	0.7	0.333	0.233

2. Assumptions Which Support the Test's Status as a Low-Risk Financial Assurance Mechanism

Two conservative assumptions were used in the selection of an appropriate revised financial test which may result in public costs that are even lower than those estimated in the Agency's analysis. These assumptions center on the Agency's ability to recover funds from a firm that files for bankruptcy and the ability of firms facing bankruptcy to obtain alternative financial assurance mechanisms. These assumptions are discussed below.

a) Bankruptcy Recovery Rates

In order to calculate public costs, the Agency needed to estimate how often it would be able to recover funds for closure and post-closure care from firms that enter bankruptcy. In its analysis for the original financial test in 1981, the Agency assumed a recovery rate of 60 percent.[8] In its 1987 financial test analysis, however, the Agency assumed that it would be able to recover only 20 percent of its obligations from bankrupt firms.[9] Recovery could take

---

[6] Assurance risk varied between the Subtitle C and D tests because the misprediction rate differed between the two tests. The misprediction rate for the Subtitle C test was 27 percent, while the rate for the Subtitle D test was 31 percent. Misprediction varied between the two tests because the Subtitle D misprediction analysis was weighted to reflect the net worth distribution of the MSWLF industry.

[7] This table was recreated from Issue Paper 1: Relevant Risk Factors to Consider in a Financial Test, ICF Incorporated, April 30, 1995.

[8] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document for the Financial Test and Municipal Revenue Test Financial Assurance for Closure and Post-Closure Care, November 30, 1981, Appendix B, p. I-6.

[9] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage, Appendix B, p. 20.

the form of legal proceedings, firms that continued to meet their financial assurance obligations while under bankruptcy protection, and/or firms that re-emerge from bankruptcy reorganization and meet their obligations.

Further analysis suggests that the Agency's use of a 20 percent recovery rate for the current financial test may have been conservative. ICF has investigated how many firms in the Agency's 1987 bankrupt firm sample later re-emerged from bankruptcy reorganization. Of the 31 firms in the sample, 12 later re-emerged from Chapter 11. Thus, reorganization could produce a recovery rate as high as 39 percent. While recovery by creditors in Chapter 11 bankruptcy proceedings often is not complete, to the extent that firms emerge from reorganization and continue operations, it is likely that they will meet their closure, post-closure care, and corrective action obligations.[10] Information on these firms, including bankruptcy and completed reorganization dates, is included in Exhibit 2 below.[11]

Exhibit 2
Bankrupt Firms from the 1987 Sample That Later Reorganized

Firm	Bankruptcy Date	Completed Reorganization Date
A.H Robins	1985	1989
Allis-Chalmers Corp.	1987	1988
Boston & Maine Corp.	1975	NA
Itel Corp.	1981	NA

[10] To the extent that firms in Chapter 11 proceedings are currently conducting closure or post-closure care, or are about to commence closure, bankruptcy proceedings *may* (but not necessarily will) delay the implementation of closure or post-closure care activities.

[11] Firms were determined to have re-emerged from bankruptcy if they were included in Standard & Poor's 1995 Register of Corporations, Directors and Executives. Further information on these firms was then obtained from Standard & Poor's Corporation Records. This approach likely underestimates the number of firms that re-emerged from bankruptcy in that it does not include all firms that were acquired by other companies. For example, A.H. Robins (a member of the 1987 sample) was later acquired by American Home Products and now is a wholly-owned subsidiary of the firm.

Exhibit 2 (continued)
Bankrupt Firms from the 1987 Sample That Later Reorganized

Firm	Bankruptcy Date	Completed Reorganization Date
LTV Corp.	1986	1993
Manville Corp.	1982	1986
McLouth Steel Products Corp.	1981	1984
Public Service Company of New Hampshire	1988	1990
Storage Technology Corp.	1984	1986
Todd Shipyards Corp.	1987	1990
Western Company of North America	1988	1989
Wheeling-Pittsburgh Steel	1985	1990

This sample recovery rate of 39 percent (measured by percentage of firms rather than percentage of financial assurance obligations) is nearly twice the 20 percent recovery rate assumption used in the 1987 analysis. Furthermore, this figure includes only funds that would be recovered through reorganization after declaration of bankruptcy. Estimates for funds recovered through legal proceedings and firms that may continue to fulfill their obligations while in Chapter 11 have not been included. The possibility that bankrupt firms could sell their facilities to other firms is also not addressed. Therefore, it is not unreasonable to estimate that actual recovery rates could be more than twice those assumed in the 1987 analysis. This finding, combined with the low rate of bankruptcy for firms passing the financial test, lends support to the Agency's conclusion that the financial test is a low-risk financial assurance mechanism.

b) Ability of Firms to Obtain Alternative Financial Assurance Mechanisms

The Agency required three years of financial data for all firms included in the bankrupt firm sample in order to evaluate the ability of a firm to secure an alternative form of financial assurance upon failing the financial test. In the 1981 financial test analysis, the Agency assumed that one half of firms that pass a financial test three years before bankruptcy will be able to establish alternate coverage.[12] For the 1987 analysis, however, the Agency assumed

[12] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage, p. 3-8. This information is provided in a discussion of the 1981 test evaluation criteria.

that a firm that can pass the financial test in any of the three years prior to bankruptcy is unlikely to obtain another financial assurance mechanism before bankruptcy occurs. The Agency explained this decision by stating,

> "A firm's ability to pass a financial test is determined by financial statements for the preceding year (the most recent complete fiscal year). A firm that meets the requirements of a financial test in the third year before bankruptcy will actually be covered by the financial test mechanism during the second year before bankruptcy. The fact that the firm could not meet the financial test requirements in the second year before bankruptcy would not be known until financial statements for the second year were completed, sometime during the last year before bankruptcy. Regulations would allow the firm an additional ninety days to obtain another mechanism, so the firm would be very close to the year of bankruptcy before EPA could force it to fund a trust fund. By this time, the financial condition of the firm may have deteriorated to the point where it is no longer able to fund a trust fund or provide any other form of financial assurance."[13]

The 1987 assumption that no firm can obtain alternative financial assurance mechanisms if it passed the financial test within three years of bankruptcy is more conservative than the 1981 assumption that half of the firms passing in the third year before bankruptcy could secure another mechanism.

In reality, some firms that fail the financial test three years before bankruptcy may be able to obtain another mechanism. Firms financed by speculative (junk) bonds regularly succeed in raising capital and small firms (with less than $10 million in tangible net worth) are able to obtain bank loans. Both of these types of firms would not pass the requirements of the corporate financial test. Thus, firms that lack sufficient financial strength to pass the financial test can obtain credit, with the possible caveat that such credit is likely to involve additional oversight or legal protection (e.g., collateral). In fact, banks do provide direct lending to firms that have higher failure rates than the average annual default rate for speculative-grade bonds.[14]

The 1987 sample of bankrupt firms can also be used to suggest that firms should be able to acquire alternative financial assurance between the time they fail the test and when they actually file for bankruptcy. Only three of the thirteen bankrupt firms that were able to pass the test did so one year before declaring bankruptcy. Of the remaining ten firms, seven passed the test two years before bankruptcy and three firms only passed the test three years before bankruptcy. It is possible that one or more of the three firms that failed the test two years before bankruptcy would have been able to obtain a third party financial assurance mechanism.

---

[13] Ibid., Appendix B, p. 9.

[14] ICF telephone conversations with Bles Dones, American Bankers Association, Funds Management, Capital Marketing Group, (202) 663-5221 and Ken Houghton, Sun Trust, (404) 588-8263, August 4, 1995. Further discussion on this topic can be found in Issue Paper 9: Effects of the Financial Test on Surety and Banking Markets, August 7, 1995.

It is also worth noting that only a small portion of the firms which fail the financial test will actually go bankrupt. The availability rates of the Subtitle C and D financial tests are 75 and 81 percent, respectively.[15] If availability is expressed as A, then (1-A) denotes the percentage of financial assurance obligations that cannot be covered by the financial test. Using the numbers above, 25 and 19 percent of obligations, respectively, cannot be covered by the financial test for financial assurance. However, the average failure rate for firms over $10 million in net worth (as shown in Exhibit 1 above) is less than one percent. Thus, the vast majority of firms that fail the financial test are not expected to enter bankruptcy, and should have sufficient financial standing to secure alternative financial assurance with relatively little difficulty.

3. Bond Ratings as Evaluators of Overall Financial Health

One commenter on the proposed financial test questioned whether a rating on a bond of a limited size was able to accurately predict a firm's ability to fully cover its often sizeable closure and post-closure care obligations. According to Standard & Poor's Corporate Finance Department, however, a triple-B or higher rating indicates that a firm is able to repay all of its obligations on a timely basis, including the obligation associated with the bond under review. As part of its rating methodology Standard & Poor's reviews the liabilities of the firm, as expressed in the firm's financial statements.[16] This would include closure and post-closure care costs, based on earlier analysis of accounting treatment of such obligations.[17]

(Additional discussion of bond ratings is presented in Issue Paper 3: Issues Relating to the Bond Rating Alternative of the Corporate Financial Test, which concluded that ratings on senior (or junior), unsecured debt not guaranteed by parent or other third-party companies provide a reliable indicator of a firm's financial health and its ability to cover its financial assurance obligations.)[18]

---

[15] U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage, p. 4-48 and Background Document: Subtitle D Financial Tests for Closure, Post-Closure Care, and Corrective Action, December 15, 1992, p. 43. Availability differs between the two tests because the Subtitle D availability analysis was weighted to reflect the net worth distribution of the MSWLF industry.

[16] ICF telephone conversation with Ed Brennan, Standard & Poor's Corporate Finance Department, (212) 208-1112, August 2, 1995.

[17] ICF Incorporated, Issue Paper 4: Accounting Issues Affecting the Corporate Financial Test, April 30, 1995.

[18] ICF Incorporated, Issue Paper 3: Issues Relating to the Bond Rating Alternative of the Corporate Financial Test, April 30, 1995, p. 2.

References

Federal Register, vol. 59, no. 196, October 12, 1994.

ICF Incorporated, Subtitle C and D Corporate Financial Test Analysis, Issue Paper 1: Relevant Risk Factors to Consider in a Financial Test, March 18, 1996.

ICF Incorporated, Subtitle C and D Corporate Financial Test Analysis, Issue Paper 3: Issues Relating to the Bond Rating Alternative of the Corporate Financial Test, July 14, 1995.

ICF Incorporated, Subtitle C and D Corporate Financial Test Analysis, Issue Paper 4: Accounting Issues Affecting the Corporate Financial Test, July 14, 1995.

ICF Incorporated, Subtitle C and D Corporate Financial Test Analysis, Issue Paper 8: Effects of the Financial Test on the Surety Industry, April 30, 1996.

ICF telephone conversation with Bles Dones, American Bankers Association, Funds Management, Capital Marketing Group, (202) 663-5221, August 4, 1995.

ICF telephone conversation with Ed Brennan, Standard & Poor's, Corporate Finance Department, (212) 208-1112, August 2, 1995.

ICF telephone conversation with Ken Houghton, Sun Trust, (404) 588-8263, August 4, 1995.

Standard & Poor's Corporate Finance Criteria 1994.

U.S. Environmental Protection Agency, Office of Solid Waste, 1987 Sample of Bankrupt Firms, Financial data.

U.S. Environmental Protection Agency, Office of Solid Waste, Background Document for the Financial Test and Municipal Revenue Test Financial Assurance for Closure and Post-Closure Care, November 30, 1991.

U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Revisions to the Subtitle C Financial Tests for Closure, Post-Closure Care, and Liability Coverage.

U.S. Environmental Protection Agency, Office of Solid Waste, Background Document: Subtitle D Financial Test for Closure, Post-Closure Care, and Corrective Action, December 15, 1992.