Subtitle C and D Corporate Financial Test Analysis
Issue Paper
Relevant Risk Factors to Consider in a Financial Test

Introduction

This paper analyzes issues raised by commenters related to the risks associated with the corporate financial test. The key issues raised by the commenters are as follows:

- Other financial valuation methods, such as CAPM, provide a better indication of financial strength than a minimum size requirement; and

- The Agency did not sufficiently consider environmental risks in developing the corporate financial test.

In order to address these issues, ICF considered three risk factors: failure risk, stock risk, and environmental risk. Failure risk is the risk of firms going bankrupt without having sufficient funds to meet their obligations. Such risk depends on a firm's financial condition and other economic factors. Stock risk is the risk associated with the stock price of a company. Finally, environmental risk, as it applies in this context, involves the risk of damage to human health and the environment caused by human or natural forces. The sources used in preparing this paper are included in a reference list at the end of the document.

The key findings of our analysis are as follows:

- Market risk measures (CAPM) show little or no correlation with firm failure risk.

- Environmental risks are not directly related to the risk of financial assurance mechanisms, and have been addressed in earlier technical standards.

This paper is organized into three sections. Section 1 provides background on the Agency's analysis of relevant financial assurance risks. Section 2 investigates the relationship between market risk measures (CAPM) and financial assurance risks. Finally, Section 3 discusses the relationship between environmental risk and financial assurance risk.

1. Failure Risk

The financial test analysis is based on failure risk because the objective of the financial test is to pass firms that are capable of meeting their financial assurance obligations, and to fail firms that would enter bankruptcy without the means to meet those obligations. The true risk of concern to the Agency is assurance risk.[1] Assurance risk is the risk of failure of financial assurance mechanisms to provide funds for environmental obligations in a timely manner. Any financial assurance mechanism entails some assurance risk. For example,

[1] Further discussion of assurance risk can be found in Issue Paper 3, "Issues Relating to the Bond Rating Alternative of the Corporate Financial Test."

standby letters of credit entail the assurance risk associated with the probability that a bank and the firm receiving the standby letter of credit will both fail at the same time.[2]

The assurance risk for EPA's proposed test is a function of the failure rate for all firms and the misprediction of the financial test. That is:

(Failure Rate For All Firms) * (Misprediction Rate For Bankrupt Firms) = Assurance Risk For All Firms

Exhibit 1 presents the estimated failure rates and assurance risk rates (by net worth categories) for both the Subtitle C and D financial tests.

Exhibit 1: Failure Rates and Assurance Risks By Net Worth Categories

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

In its financial test analysis, the Agency evaluated a variety of financial measures to determine which ones discriminated best between viable and bankrupt firms, and thereby minimized assurance risk. Through this process, a variety of measures, including net worth, were identified. The analysis found that larger firms with higher net worth failed less frequently than firms will lower net worth. Exhibit 1 clearly illustrates this point. Assurance risk decreases steadily across both tests as net worth increases. In addition to net worth, the financial test incorporates other measures that assess a firm's financial strength.

The proposed test's ratio and bond rating alternatives were both designed to meet the performance standards specified in the October 9, 1991 criteria for financial assurance for MSWLFs.[3] The assurance risk for the two alternatives are comparable (see EPA's Issue Paper, Issues Relating to the Bond Rating Alternative of the Corporate Financial Test) and the Agency has concluded that these tests represent a cost-effective trade-off of public and private costs.

[2] A comparative analysis of assurance risk for different financial assurance mechanisms is presented in Analysis of Assurance Provided by Current and Proposed Financial Assurance Mechanisms, ICF Incorporated, November, 1992, p. 64.

[3] Federal Register, October 9, 1991, p. 51032.

2. Stock Risk

One commenter on the proposed rule stated that the capital asset pricing model (CAPM) is a better measure of risk than net worth. The commenter felt that financial valuation methods (such as CAPM), which compare a firm's risk to that of other firms in the market, better evaluate a firm's failure risk than the net worth requirement, while avoiding the barriers to entry inherent in a minimum size requirement.

The capital asset pricing model states that the expected risk premium, which is the difference between a stock's expected return and the risk-free rate of return, varies in proportion to a variable called beta. Beta is the variable that captures stock risk,[4] and is defined as the sensitivity of a stock's return to market movements. The beta variable is centered at 1.0, which is the unavoidable risk of the market portfolio. This level of risk is referred to as market, or systematic risk. Stocks with betas greater than 1.0 imply that the stock is aggressive and sensitive to market movements. The standard deviation of a portfolio of stocks with a beta of 1.4 would be 1.4 times that of the market portfolio.[5] Conversely, stock portfolios with betas lower than 1.0 are somewhat more stable and less likely to be affected by market swings.

If, as the commenter asserts, CAPM is a strong indicator of failure risk, then the factors affecting a firm's beta should be consistent with the failure risks of a firm. In order to test this expectation, ICF gathered Value Line data on betas and financial strength for a sample of firms. The sample includes four firms from the Subtitle D financial test analysis, other environmental companies identified by Value Line, and a random sample of other firms.[6] The scatter plot diagram included as Exhibit 2 reveals no clear correlation between a company's beta and its financial strength, as measured by Value Line.

If failure risk and beta were related, financially weak companies would have high betas, and financially strong firms would have low betas (i.e., a regression line would run from the upper left to the lower right in the diagram). A comparison of MCN Corp. and Compaq Computer (two firms with equal financial strength ratings) illustrates the lack of such a trend. While MCN Corp. has a low beta, Compaq's beta is among the highest in the sample. Mitchell Energy and NUI Corp., with low betas and poor financial strength ratings, also reveal the lack of correlation between beta and financial strength. Furthermore, Coca-Cola and Kellogg have the strongest financial ratings in this group, but their stock betas are almost exactly equal to the systematic market risk (1.0).

The strength of this correlation was further tested by running a regression analysis on Value Line's beta and financial strength data. This regression line is plotted in Exhibit 2 below. The resultant R-squared of only 0.087 provides evidence of the lack of correlation between these two variables. In general, an R-squared close to zero indicates that there is no clear relationship between two variables (here, stock beta and financial strength). Our regression

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[4] Stock risk can be thought of as the variability, or statistical variance, of a stock's price over time.

[5] Brealey and Myers, Principles of Corporate Finance, Third Edition, p. 134.

[6] Value Line Investment Survey, Part 3: Ratings and Reports, 1995.

analysis indicates that only 8.7 percent of the variation in financial strength can be explained by variation in stock betas. The t-statistic of the slope of -1.634 further proves this dissociation.[7] Any slight relationship derived from the diagram can be attributed to the influence of leverage on both betas and financial strength. Leverage tends to exaggerate stock shifts and a firm that is heavily leveraged is also likely to experience financial duress.

The scatter plot diagram and table containing the data found in the scatter plot can be found on the following three pages. The data table also includes Moody's and S&P's bond ratings for the four Subtitle D candidate firms in the sample. This information was included to facilitate comparisons of Value Line's financial strength ratings and the bond ratings allowed by EPA's financial test.

[7] To test the interdependence of two variables, one compares the t-statistic of the slope with the critical t-statistic (here, 2.05). Given that the absolute value of the slope's t-statistic is less than the critical t-statistic, the null hypothesis (i.e., the two variables have no relationship) cannot be rejected. This implies that stock betas are not related to financial strength.

EXHIBIT 2 COULD NOT BE REPRODUCED ELECTRONICALLY AND IS ONLY AVAILABLE IN THE PAPER DOCKET.

Exhibit 3: Beta Versus Financial Strength			
Company	**Beta**	**Financial Strength**	**S&P/Moody's Senior Ratings**
Air & Water Tech.	1.55	C+	
All Waste Inc.	1.15	B	
Arrow Elec.	1.45	B++	
Browning-Ferris Industries, Inc.	1.25	B++	A/A2
Burlington Inds.	1.25	B	
Centex Corp.	1.30	B++	
Cisco Systems	1.65	A	
Coca-Cola	1.05	A++	
Compaq Computer	1.45	A+	
Dean Foods	0.90	B++	
Ecolab Inc.	0.95	B+	
Federal Realty	0.80	B++	
Georgia-Pacific	1.30	B+	
Groundwater Tech.	0.90	B+	
Int'l Tech.	1.40	C	
Ionics, Inc.	0.95	B+	
Kellogg Co.	1.00	A++	
Laidlaw Inc.	1.25	B	BBB+/Baa2
MCN Corp.	0.60	A+	
Mitchell Energy	0.65	B	
Nordson	0.90	A	
NUI Corp.	0.55	B+	
OHM Corp.	1.20	B	
Rollins Truck Leas.	1.20	B	
Rollins Env. Ser.	1.40	B	
Safety-Kleen	1.10	B++	
Sanifill Inc.	1.25	B	BB/NR
Southern Co.	0.65	A	
Wheelabrator Tec.	1.50	B	
WMX Technologies, Inc.	1.30	B++	AA-/A1

3. Environmental Risk

One commenter expressed concern that the proposed financial test does not take into account costs related to the impact of a landfill on wildlife and the effect of natural disasters. Other commenters have noted that using the same financial tests for Subtitle C and D facilities does not recognize the difference in the risks associated with Subtitle C facilities relative to MSWLFs.

The types of costs the commenter has mentioned are related to the environmental risk posed by a landfill. Environmental risk associated with MSWLF landfills has been addressed under a separate rulemaking and does not fall under the scope of the proposed Subtitle D corporate financial test rule. The Solid Waste Disposal Facility Criteria, finalized on October 9, 1991 specifies technical standards and design criteria that all municipal solid waste landfills must comply with, such as "location restrictions, ground-water monitoring requirements, . . . These criteria were developed with the objective of "providing minimum nationwide standards for protecting human health and the environment . . . "[8] As part of the analysis that was conducted in support of this rulemaking, the Agency evaluated the human health and resource damage benefits of the rule.

The technical standards and design criteria described above are designed to protect human health and the environment and must be implemented regardless of landfill ownership and *regardless* of the type of financial assurance mechanism that is used. Therefore, the use of the financial test or any other mechanism does not affect environmental risk; that risk has been addressed by technical standards and design criteria.

Even more stringent technical criteria have been specified, in other rulemakings, for Subtitle C facilities. Financial assurance requirements for both Subtitle C and D facilities are only designed to provide adequate funds for specified environmental obligations. The only relevant incremental risk associated with firms operating facilities under both programs is the risk that the financial resources could be inadequate to fund both sets of environmental obligations. The financial test, however, protects against this risk with the requirement that firms have net worth equal to $10 million plus all of their environmental obligations covered by the financial test (in addition to other bond rating or financial criteria).

[8] Federal Register, October 9, 1991, p. 50978.

REFERENCES

Brealey, Richard A. and Stewart C. Myers. Principles of Corporate Finance, Third Edition, 1988.

ICF Incorporated. Analysis of Assurance Provided by Current and Proposed Financial Assurance Mechanisms, November 1992.

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