



Risk of Financial Distress Among Critical Access Hospitals: A Proposed Model

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Introduction

During the 1980s and 1990s, hundreds of rural hospitals closed their doors across the United States. In response, the Medicare Rural Hospital Flexibility Program created the Critical Access Hospital (CAH) program to help stabilize the finances of rural hospitals and sustain access to needed healthcare services for rural residents. Characterizing the overall financial performance of a hospital can be difficult because hospitals seldom perform poorly in all dimensions of financial performance. For example, a hospital may be unprofitable but have ample financial reserves. Although researchers have long been interested in measuring the financial distress of businesses, there has been little attention given to hospitals in general and rural hospitals in particular.

The purpose of this brief is to present a model to predict the financial distress of CAHs. A well-functioning prediction model can be used by administrators and state program officers as an early warning system to identify hospitals at increased risk of facing financial distress.

Approach

After reviewing the research literature and conducting focused discussions with multiple lenders and consultants specializing in critical access hospitals, we developed a model of CAH financial distress. Figure 1 shows that today's characteristics (recent financial performance and measures of a market in which a hospital operates) are used to assign CAHs to one of four "risk levels" that predict whether a CAH will be in financial distress two years later.

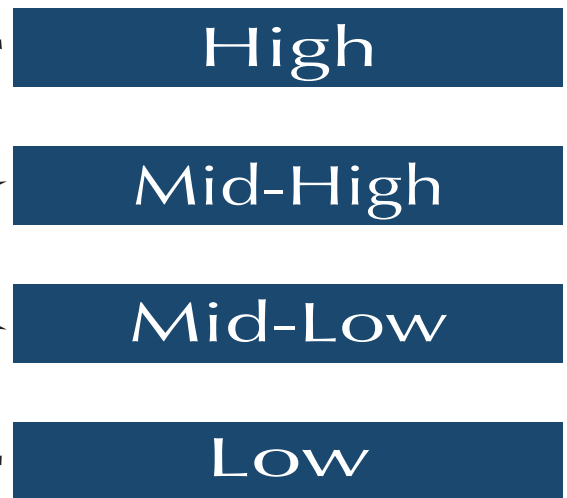
Key Findings

- A model that uses current financial performance and market characteristics can be used to predict financial distress of Critical Access Hospitals (CAHs).
- The model separates hospitals into risk of financial distress categories; hospitals in the highest risk category had up to 15 times the rate of financial distress events as hospitals in the lowest category.
- Risk of financial distress categories can provide an effective early warning system for CAH boards and administrators as well as enable state program directors to prioritize resources more effectively.
- The model will be further refined based on input from researchers, practitioners, and CAH administrators.

Today's Characteristics



Risk of Distress in Two Years



The model uses financial performance variables (current profitability, reinvestment, and hospital size) and market characteristics variables (competition, economic status, and market size) to predict financial distress (equity decline, unprofitability, and closure) two years later. Many measures of financial performance and market characteristics were considered for model inclusion; the final model was selected based on simplicity, face validity, and predictive performance.

For the financial performance variables:

Profitability was measured by earnings before interest and taxes / total assets, operating margin, and the 2-year change in operating margin;

Reinvestment was measured by retained earnings / total assets, and;

Hospital size was measured by net patient revenue.

For the market characteristic variables:

Competition was measured by distance to the nearest hospital with at least 100 beds and percent market share, if less than 25 percent;

Economic status was measured by the percent unemployment in the market area, and;

Market size was measured by the population in the market area.

For the financial distress measures, five events considered as a “signal” of financial distress were used:

Equity decline was measured by whether the **fund balance declined** more than 25% and whether the **fund balance was negative**;

Unprofitability was measured by binary variables for a **negative cash flow margin** and three consecutive years of **negative operating margin**; and

Closure was whether the hospital **closed**.

Markets were constructed comprised of the ZIP codes contributing 75% to the Medicare admissions for a hospital for a given year. Market and hospital characteristics were obtained from Claritas PopFacts and the Healthcare Cost Report Information System (HCRIS). The sample included a total of 6461 hospital-year observations for the years 2000-2007, 5622 observations for free-standing hospitals and 839 observations for hospitals owned by another entity.

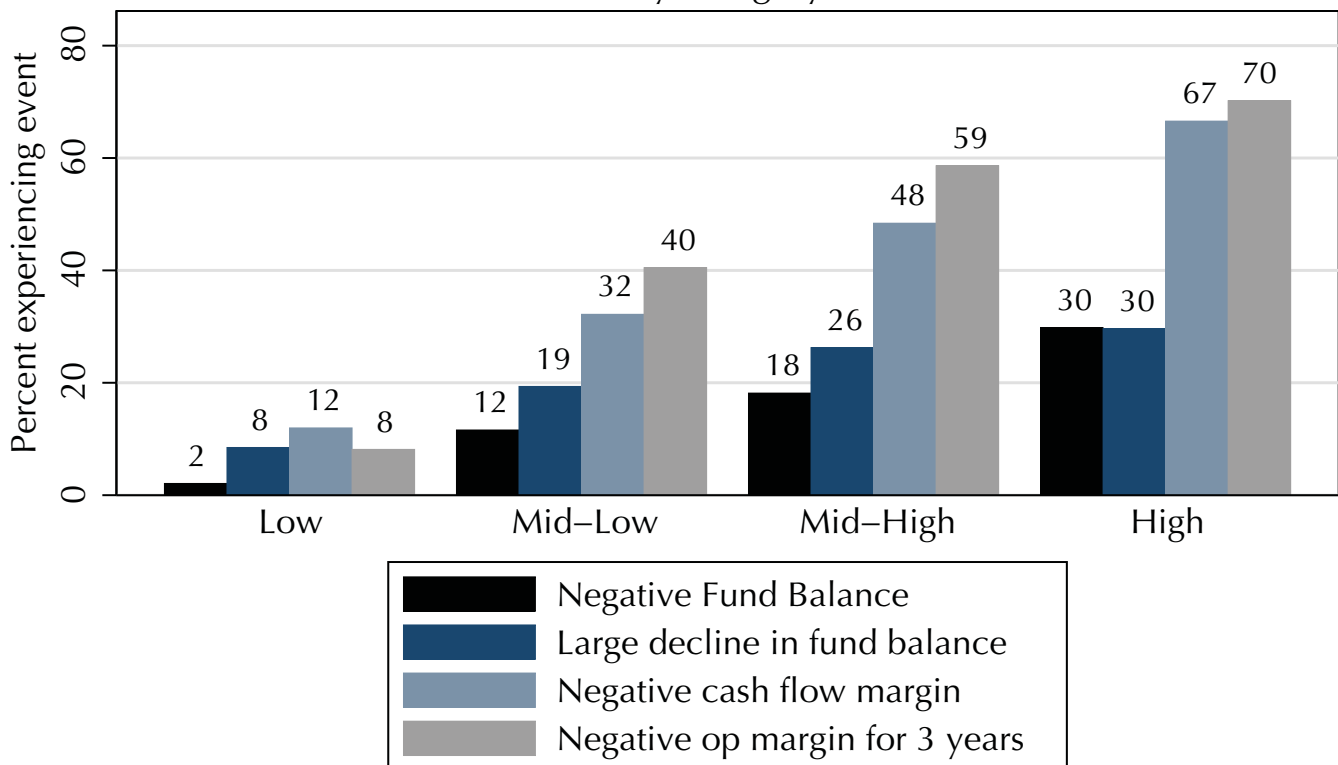
Results

Models predicting the subsequent occurrence of the five distress events, as predicted by the financial performance and market characteristics, were constructed. The predictive variables together determined a financial distress index value. Four categories that reflect different risk of financial distress in the near term were created by separating the financial distress index into deciles and then grouping deciles with similar rates of financial distress events.

Figure 2 depicts the percent of hospitals in each distress category that experienced a financial distress event within two years.¹ Overall, the model predicts financial distress rather well. Sixty-seven percent and 70 percent of hospitals in the high risk category had a negative cash flow margin and

and had experienced at least three consecutive years of negative operating margin and, respectively, two years later. In comparison, only 12 percent and 8 percent of hospitals in the lowest risk category experienced a negative cash flow margin and were in their third consecutive year of a negative operating margin and, respectively, two years later. Thirty percent of hospitals in the high risk category experience a negative fund balance and decline in fund balance of 25 percent or more two years later. In comparison, only 2 percent and 8 percent of hospitals in the low risk category experience a negative fund balance and decline in fund balance of 25 percent or more, respectively, two years later. In general, the model differentiates between hospitals at high and low risk of financial distress.²

Risk of financial distress markers
By category



N = 6461 hospital-years. Closures not shown -- see Footnote 1.

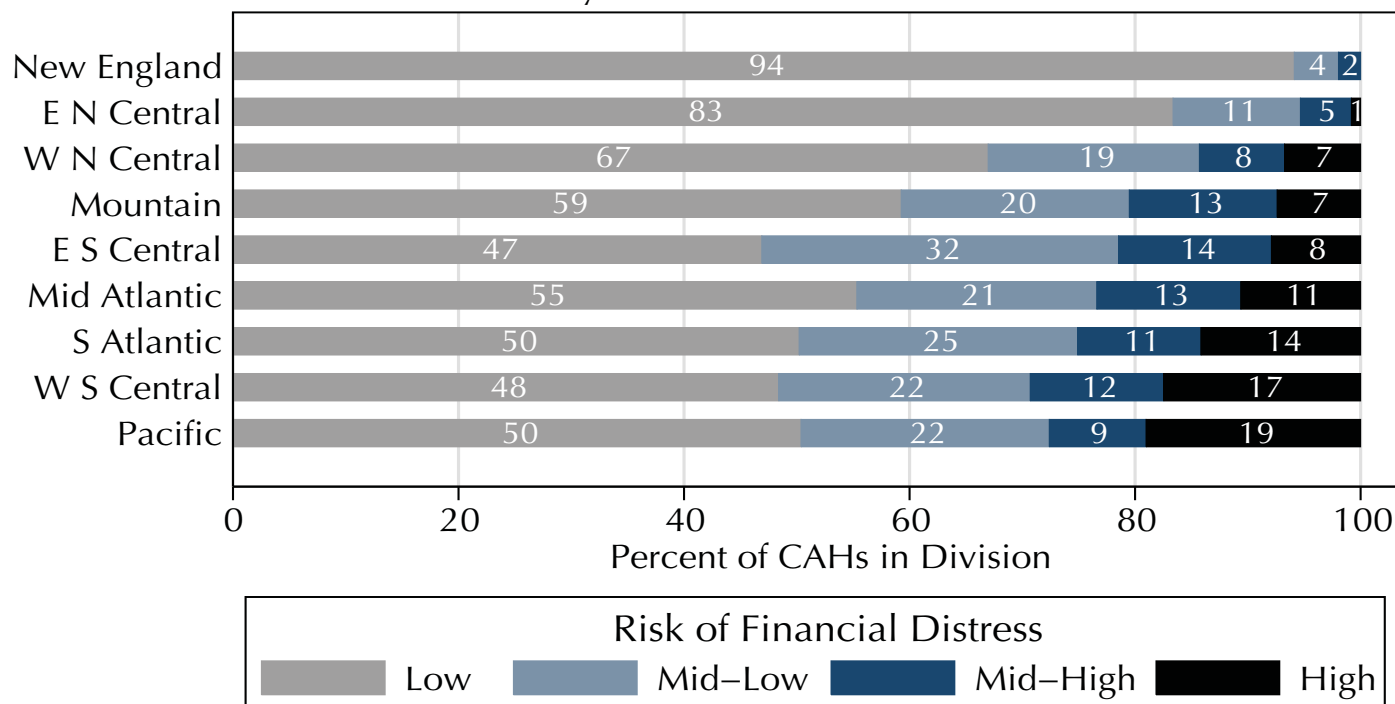
¹ Because closures occurred rarely (N=12), closure is not presented in the graph.

But the risk of closure varied from .25% in the Low risk category to 1.3% in the High.

² For all five distress events, the risk category is a statistically significant predictor ($p < .0001$).

Distribution of financial distress category

By Census Division: 2005–2007



N = 3004 hospital-years.

Percentages may not add to 100 due to rounding.

New England had zero at high risk during this period.

Figure 3 presents the distribution of risk categories by Census division. Potential distress varies tremendously by Census Division; the percent in the High category ranges from less than one percent in New England and the East North Central divisions to nearly one in five in the Pacific and West South Central divisions. Generally, CAHs in the South and West face more distress than in the Northeast and Midwest.

Over the next year, input and suggestions on refining the model will be solicited from administrators and others knowledgeable of CAH finances. To learn more, or to review a discussion document on the index, contact the CAH Financial Indicators team at cah.finance@schsr.unc.edu.

Summary

A model that uses financial performance and market characteristics can be used to predict financial distress of Critical Access Hospitals. To make the model useful to hospital managers and boards, risk of financial distress categories were created. Accurate assignment of hospitals to categories that reflect low, mid-low, mid-high, and high risk of financial distress may provide an effective early warning system to CAHs, allowing administrators and state program coordinators to target efforts on those at higher risk.

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