Evaluation of the factors affecting financial risk of not-for-profit hospitals

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Background

- Substantial financial pressure existed for the industry during late 1990s and early 2000s:
  - Medicare inpatient margins fell from: 16.7% in 1997 to 4.7% in 2002 (effect of 1997 Balanced Budget Act)
  - Hospital total margins declined from 6.2% in 1997 to 3.5% by 2002.
- Widening gap between “have” and “have-not” hospitals.

Research Questions

- Which hospital and environmental characteristics are associated with financial risk of not-for-profit hospitals?
  - What underlying factors are associated with financial trouble measured by accrual-based financial ratios and cash flow?
  - Are there any differences between urban and rural hospitals in significant factors?

Literature Review

- Inefficiency
  - Hospital inefficiency was a significant predictor of closure (Deily, McKay, and Dorner, 2000; Ciliberto and Lindrooth, 2006).
  - Hospitals destined to close had significantly lower occupancy rates than their non-closing rivals (Lindrooth, LoSasso, and Bazzoli, 2003).
  - Financial difficulties are most likely in hospitals with fewer than 1000 admissions (Stensland & Milet, 2002).

Literature Review

- Third party payment
  - Third party payment generosity strongly predicted closures; efficient but poorly reimbursed hospitals could close (Ciliberto and Lindrooth, 2006).
  - Hospitals that are dependent upon Medicaid (and to a lesser extent, Medicare) have a higher probability of closing (Dranove and White, 1998).
  - Provision of services to Medicaid patients had a negative impact on the profitability of Pennsylvania hospitals (Rosko, 2004).

Literature Review

- Managed care penetration
  - Hospitals located in markets with higher HMO penetration have lower financial performance as reflected in revenues, expenses and operating margin (Clement and Grazier, 2001).
  - Increasing managed care penetration exerts greater financial pressures (Young et al., 2002; Loubeau and Jantzen, 2005).

Literature Review

- Competition
  - Competition appears to have a bigger negative impact on revenue growth than on expense growth (Hadley et al., 1996; Younis, 2004).
  - Competition appears to affect the risk of hospital closure and the likelihood of mergers and acquisitions in the health care industry (Williams et al., 1992: Noh et al., 2006).

Conceptual Framework

- Hadley et al. (1996) suggest that hospital performance is a function of:
  - Hospital characteristics
  - Exogenous factors
- Financial risk may be affected by hospital characteristics (e.g., organizational and operational factors) and exogenous factors (e.g., market demand and competition).

Key Financial Risk Measures

- Accrual-Based Measure
  - Financial Strength Index (FSI) by Cleverley and Cameron
  - A composite measure of four dimensions of financial health: profitability, liquidity, financial leverage, and physical facilities.
- Cash-Based Measure
  - Operating cash flow

Identification of NFP Hospitals with Higher Financial Risk

- Cleverley and Cameron examine four measures: total margin, days cash on hand, debt financing percentage, and age of physical facilities.
  - Firms with smaller profit, lower levels of liquidity, higher debt level, and older facilities compared to the industry median are identified as financially risky (i.e., FSI < 0).
- Firms with negative cash flows for 4 consecutive years.

Study Data

- Created 1998 to 2001 panel of hospitals:
  - CMS Medicare cost reports
  - AHA Annual Survey of Hospitals
  - Area Resource File
  - InterStudy HMO data
- Samples consisted of around 1,800 private not-for-profit hospitals with complete data

Empirical Approach

- Used panel data to estimate effects of multi-variables on the likelihood of being classified as financially risky.
- Logit analysis
- Sample split by urban/rural areas (i.e., MSAs vs. non-MSAs)

Results

	Financial Strength Index < 0 ?		Negative cash flows for 4 consecutive yrs ?	
	1 = yes	0 = no	1 = yes	0 = no
MSAs	131	1,066	129	1,068
Non-MSAs	39	607	36	610

Results

Dependent Variable: Binary Variable Based on FSI

	Hospitals in MSAs (n=1,197)		Hospitals in non-MSAs (n=646)	
Variables	Coef.	S.E.	Coef.	S.E.
Occupancy rate	-1.75**	0.29	-0.22	0.57
Fixed cost ratio	-0.61**	0.42	-0.88	0.37
Medicare payer mix	1.62**	0.46	1.73*	0.89
Medicaid payer mix	1.70**	0.46	0.22	1.10
Herfindahl Index	-2.62**	0.37	0.04	0.34
HMO penetration	1.01*	0.44	-	-

**p-value < .01, *p-value<.05

Results

Dependent Variable: Binary Variable Based on FSI

	Hospitals in MSAs (n=1,197)		Hospitals in non-MSAs (n=646)	
Variables	Coef.	S.E.	Coef.	S.E.
% MDs	0.10**	0.03	-0.41	0.16
% Pop. Over 65	9.97**	1.74	-1.07*	2.77
Unemployment Rate	0.12**	0.03	0.05	0.04
System	-0.14	0.11	0.09	0.17
Bed size	0.04	0.03	0.23	0.14
Case-mix index	-0.27**	0.27	-0.96	0.80
Teaching status	0.72**	0.11	-0.19	0.37

**p-value < .01, *p-value<.05

Results

Dependent Variable: Binary Variable Based on Cash Flow

	Hospitals in MSAs (n=1,197)		Hospitals in non-MSAs (n=646)	
Variables	Coef.	S.E.	Coef.	S.E.
Occupancy rate	-1.81**	0.30	-1.50*	0.62
Fixed cost ratio	-0.74	0.42	-3.28**	0.83
Medicare payer mix	-1.44**	0.49	5.38**	0.91
Medicaid payer mix	1.78**	0.44	4.37**	1.10
Herfindahl Index	-3.17**	0.44	-0.30	0.38
HMO penetration	3.49**	0.46	-	-

**p-value < .01, *p-value<.05

Results

Dependent Variable: Binary Variable Based on Cash Flow

	Hospitals in MSAs (n=1,197)		Hospitals in non-MSAs (n=646)	
Variables	Coef.	S.E.	Coef.	S.E.
% MDs	0.13**	0.03	0.14	0.10
% Pop. Over 65	7.02**	2.04	-10.53**	3.06
Unemployment Rate	0.03**	0.03	-0.01	0.04
System	-0.19	0.11	0.56**	0.18
Bed size	0.06*	0.03	-0.59**	0.19
Case-mix index	-1.12**	0.29	-2.97**	0.90
Teaching status	1.06**	0.12	0.64	0.37

**p-value < .01, *p-value<.05

Summary of Findings

- Occupancy rate was a significant factor for financial risk.
- Medicaid payer mix was positively associated with financial risk.
- Market competition appeared to increase the financial risk of urban hospitals; however, this effect was not apparent in rural hospitals.
- Managed care penetration had a positive association with financial risk.

Implications of Findings

- Hospitals having difficulty filling their beds are most likely to have greater financial risk.
- The negative impact of Medicaid dependency on the financial performance of hospitals is consistent with previous studies.
- The influence of market forces (e.g., competition and managed care penetration) on the financial condition of urban hospitals appears to be significant.

Discussion

- Consequences of financial risk
  - Bankruptcy and closure?
  - Mission
  - Quality and safety