Journal of Health Economics 29 (2010) 87–109

Contents lists available at ScienceDirect

Journal of Health Economics

journal homepage: www.elsevier.com/locate/econbase

Hospital closure and economic efficiency

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ARTICLE INFO

Article history:
Received 16 January 2007
Received in revised form 27 October 2009
Accepted 28 October 2009
Available online 10 November 2009

JEL classification:
I110
I118

Keywords:
Healthcare
Health Care
Health Insurance
Hospitals
Policy Making

ABSTRACT

We present a new framework for assessing the effects of hospital closures on social welfare and the local economy. While patient welfare necessarily declines when patients lose access to a hospital, closures also tend to reduce costs. We study five hospital closures in two states and find that urban hospital bailouts reduce aggregate social welfare: on balance, the cost savings from closures more than offset the reduction in patient welfare. However, because some of the cost savings are shared nationally, total surplus in the local community may decline following a hospital closure.

1. Introduction

Communities often spend public funds to attract or retain private businesses because they believe that the benefits in jobs and local spending will offset the tax expenditures.[1] It is less common for a community to prop up a local business that is on the verge of bankruptcy. Hospital closures are an important exception. When a hospital closes, its patients must turn to more distant and less familiar alternatives. For these reasons, public outcry typically accompanies the announcement of a pending hospital closure. In contrast to most other industries, the outcry often spurs governments to intervene to keep ailing hospitals afloat. For example, in 1999, local officials in Quincy, Massachusetts, provided a $12.1 million bail out of Quincy Hospital to facilitate its acquisition by a nonprofit enterprise. Similarly, in 2000, officials in Tampa, Florida, authorized $3.5 million from local tax revenue to bail out Tampa General Hospital.

In well-functioning markets, insolvency usually signals that a firm is inefficient, its product is in low demand, or both. Previous studies have indicated that this rule of thumb applies to hospitals. For example, in a study of closures in the mid-1990s, Lindrooth et al. (2003) found that hospitals that were destined to close had occupancy rates of around 48%, while their surviving rivals had occupancy rates that were typically over 64%. This suggests that local residents did not place much value on these hospitals and that alternative sources of care were available.

The notion of bailing out a failing firm would not normally arise in the context of traditional business ventures, except perhaps as a political matter. But the hospital industry is comprised of many nonprofit and local government-owned hospitals, and industry is rife with problems related to moral hazard and adverse selection. Furthermore, the prices paid by traditional Medicare and traditional Medicaid for hospital services are generally set by fiat rather than by the market. Thus, for a sizable group of patients, prices do not necessarily adjust to supply and demand conditions. Although the prices paid by private health plans (along with Medicare and Medicaid managed care plans) are shaped by market forces, consideration of pricing alone may not result in hospital closures that are socially optimal.

Consider the distortions created by the absence of the profit motive. We expect for-profit hospitals to exit markets when their

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[1] See Black and Hoyt (1989), King et al. (1993) and others for analyses of the competition between local markets that often accompanies such subsidies.

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doi:10.1016/j.jhealeco.2009.10.006

costs of remaining in business exceed their ability to translate value creation into revenue (Wedig et al., 1989). This expectation likely does not apply to the nonprofit and government-owned hospitals that dominate the United States market.[2] Bazzoli and Andes (1995) and Duffy and Friedman (1993) lend support to this notion by showing that, in contrast to struggling for-profit hospitals, distressed nonprofit hospitals linger in the market despite financial difficulties. Other studies have shown that for-profit status is a significant predictor of exit (e.g., Ciliberto and Lindrooth, 2007; Succi et al., 1997; Wedig et al., 1989; Williams et al., 1992). Finally, note that nonprofit hospitals usually receive oversight from community-based boards, whose interests in keeping a hospital open may diverge from both profit and welfare maximization. Specifically, a hospital board may care little about the effects of potential closures on local healthcare spending. Taken together, these results suggest that nonprofits may close less frequently than is socially optimal.

Other market distortions may justify bailouts. Hospital markets are imperfectly competitive, hospitals cannot perfectly price discriminate, and some prices are regulated. Thus, the total social surplus generated by an unprofitable hospital may exceed its costs.[3] For example, Medicaid payments normally meet or exceed variable costs (to encourage hospitals to admit Medicaid patients), but they often do not cover the average total cost of care. As a result, hospitals that rely on Medicaid payments may go bankrupt even when the value they create exceeds their cost of doing business. Conversely, an efficient hospital may linger even if its closure were to drive down local healthcare spending.

Finally, we note that while the utility loss from a hospital closure is borne entirely by the local community, the cost savings are shared by the local government, the state government, and the federal government. Hospitals derive an average of 30% of their revenue from the federal Medicare program. As a result, the cost savings from shutting these hospitals would be shared with the federal government, though the local community presumably does not internalize the value of federal savings. Similarly, the federal and state governments will value the cost savings from the Medicaid program. Accordingly, we evaluate the merits of closures from both state and national perspectives.

This discussion suggests that the merit of a particular closure or bailout is an empirical question that requires the measurement of both cost and utility effects. There is a robust literature on the former, which we employ herein. To measure the utility effects of hospital closures, we draw on previous models of the effects of changes in hospital market structure on consumer welfare (Town and Vistnes, 2001; Capps et al., 2003 ("CDS"). Specifically, we build upon the option demand framework from CDS. CDS studied negotiations between hospitals and managed care organizations and developed an index of a managed care organization's enrollees' willingness to pay (WTP) for the inclusion of a given hospital or set of hospitals in their network.[4] We do not consider the effect of outcomes beyond what is measured and reflected in a patient's ex-ante utility function. WTP captures the full utility benefit of access, including the quality of the hospital under consideration, convenience afforded by an attractive location, and consumers' idiosyncratic preferences for that hospital.

In the current context, we require a dollar-denominated estimate of the lost utility from a hospital closure that we can compare to the attendant cost savings. To achieve this, we develop a method for computing the equivalent variation of the utility effects of a hospital closure. Weber (2009) measures the effect of access to ambulatory surgery centers on welfare using a method that more closely follows that of Small and Rosen (1981). Our approach differs in that we incorporate option-demand for the hospital's services by integrating over the distribution of expected illness for the entire population. The resulting welfare effect of closure is converted to a 'travel time equivalent' which is the total number of hours that would need to be driven to reduce utility by the same amount as the closure.

Our results indicate that, in general, urban hospital bailouts reduce aggregate social welfare: the cost savings from the closures we studied more than offset the reduction in patient welfare. However, we also found that because some of the cost savings are shared nationally, several of the closures led to a decline in total surplus in the local community. We conclude with a discussion of the implications of hospital closures on affected populations' access to care.

2. Background

A number of studies have examined the effects of closure on hospital costs and found a generally positive relationship between inefficiency and closures. Mobley and Frech (1994) found that expected future growth and size were significant determinants of closure. Deily et al. (2000) found that hospital inefficiency explained a meaningful portion of the probability of closure. Similarly, Ciliberto and Lindrooth (2007) found that inefficiency was a significant predictor of closure in the mid- to late 1990s. However, they also showed that third-party payment generosity strongly predicted closures, which suggests that efficient but poorly reimbursed hospitals could close. In this scenario, the generosity of private insurers would likely increase as the value that a hospital brings to the market increases, because highly valued hospitals can usually negotiate more favorable rates.[5] However, government payers, especially Medicaid, do not reward valued hospitals in the same way. Thus, hospitals that are dependent upon Medicaid (and to a lesser extent, Medicare) could close in spite of generating positive surplus.

Two studies, one fairly recent, examined the impact of hospital closures on patients. McNamara (1999) used a nested logit model to estimate the welfare effects of rural hospital closures. McNamara concluded that the rural hospitals brought enough value to the market to warrant a subsidy, although he did not specifically examine hospital costs. Buchmueller et al. (2006) compared outcomes of patients in zip codes that had been affected by closure to those that were unaffected by closure. They found that closures led to increases in the probabilities of death from Acute Myocardial Infarction (AMI) and from unintentional injuries.

Lindrooth et al. (2003) found that closure led to an evolutionary improvement in the efficiency of urban hospital markets. This increase was due mostly to the filling of beds at neighboring hospitals and to the resulting scale economies rather than to the baseline inefficiency of the closed hospital. In a different context, several papers have measured the cost of an empty hospital bed and reached conclusions consistent with Lindrooth et al. (e.g., Gaynor

[2] This might occur because the nonprofit is willing to sacrifice expected profits to sustain patient welfare, or, in a competitive market, because the for-profit does not believe it can outlast a nonprofit in a war of attrition (Ghemawat and Nalebuff, 1990). Nonprofits may also draw upon donors to cover operating shortfalls (Philipson and Posner, 2006). See also, Lakdawalla and Philipson (1998).

[3] See Philipson et al. (2006) for a discussion of how the gap between total and producer surplus causes under investment in medical research and development.

[4] This index is derived from the formula for the value of a choice set in the Logit demand framework, as described in McFadden (1974).

[5] See Capps et al. (2003).