HOSPITAL PERFORMANCE

The welfare loss from hospital cost-shifting behavior: a partial equilibrium analysis

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Summary

Cost shifting occurs when changes in administered prices of one payer lead to compensating changes in prices charged to other payers. Microeconomic theory suggests that cost shifting can take place under limited conditions and some empirical studies indicate that that hospital cost shifting may have actually occurred at various times. This study designs a model to conceptualize and quantify the potential welfare loss caused by hospital cost shifting under idealized yet fairly plausible conditions. The resulting estimate yields only a small efficiency loss of at most, 0.84% of private hospital expenditures in the US for 1992. Copyright © 2004 John Wiley & Sons, Ltd.

Keywords cost shifting; Medicare; Medicaid; welfare loss

Introduction

Ginsburg [1] defines cost shifting 'as the phenomenon in which changes in administered prices of one payer lead to compensating changes in prices charged to other payers'.[a] Hospitals raising prices paid by commercial insurers in response to Medicare payment reductions provides an example of cost shifting. Ginsburg notes that margin shifting might be more descriptive of the phenomenon because the discussion surrounding cost shifting focuses on the difference between prices and costs. But the phrase 'loss shifting' might be even more reflective of cost-shifting behavior because the literature has only been interested in the shifting of losses, not the shifting of profits, almost as if other payer prices respond asymmetrically to changes in administered prices.

Regardless of its name, not all policy analysts, particularly economists, are convinced that cost shifting takes place on a regular basis. According to mainstream economics, private prices are set to maximize economic profits. As a result, raising private prices in response to public price cuts, produces even lower profits. To practice cost-shifting behavior, Morrisey [2] explains hospitals must 'have market power that heretofore it had not exploited'. He goes on to note that: 'If providers have market power and, indeed, have not charged private insurers 'what the traffic will bear', then cost shifting can exist – even as a matter of theory'.[b]

Curious about the extent to which the practice actually occurs in the United States, researchers have subjected the theory of cost shifting to empirical testing. At best, the empirical evidence regarding hospital cost-shifting behavior has been mixed. Two papers by Hadley and Feder [3] and Zwanziger *et al.* [4] attest to the ongoing nature of the cost-shifting discussion (i.e. from 1985 to 2000) and the general inconclusiveness of the empirical

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findings. Specifically, Hadley and Feder compared 128 private not-for-profit community hospitals in the early 1980s and found that hospital markups on private payers did not vary systematically with revenue pressure in the US. Instead, hospital responded to revenue pressure by taking several actions to reduce costs, including reducing personnel, postponing employee pay increases, and limiting charity care. Zwanziger, Melnick, and Bamezai used California data for the 1983–1991 period, and find empirically that both for-profit and not-for-profit hospitals increased private pay prices in response to Medicare payment rate reductions.[c]

Thus, economic theory suggests that hospital cost shifting *can* take place under some limited conditions and at least some empirical evidence suggests that it *does* sometimes occur in practice. Although the practice remains highly controversial, this study does not attempt to question the theory or empirical results concerning cost shifting. Instead, this study develops an idealized yet fairly plausible model that allows for the conceptualization and estimation of the 'potential' welfare loss that may be caused by the implicit tax resulting from hospital cost-shifting behavior, if indeed it does take place.[d] The model is then used to calculate the national welfare loss from hospital cost shifting in the US. Previous studies pointing to cost-shifting behavior have been silent about the quantitative magnitude of the economic damages

created by this practice although Ginsburg [1] acknowledged the possibility that cost-shifting may lead to higher private insurance premiums and thus higher numbers of uninsured people. This paper finds that the national welfare loss associated with hospital cost-shifting behavior amounted to no more than 0.84% of private hospital expenditures in 1992, the most recent year for which public prices resulted in sizeable hospital losses.

Modeling the welfare loss from cost-shifting behavior

Exhibit 1 provides a graphical representation of the private pay and public pay submarkets of a local hospital industry before cost shifting takes place.[e] For simplicity, suppose that only Medicare patients comprise the public pay category and the marginal (and average) costs, MC, are constant and the same for treating both private pay and Medicare patients. The graph on the left shows the initial equilibrium in the private pay submarket (before cost shifting takes place). It is assumed that the hospital has (or hospitals collectively have) some degree of market power as reflected in the downward sloping demand curve, *D*. Recall that hospitals must have some market power to practice cost-shifting behavior.
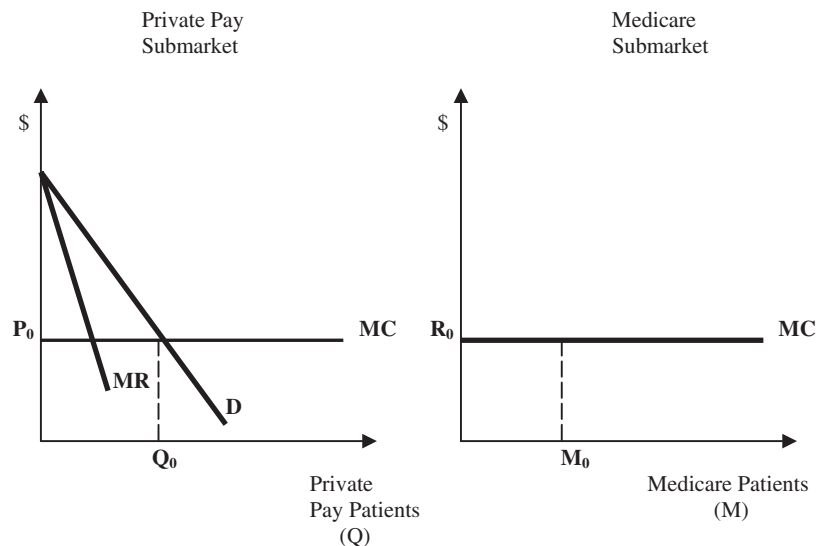

Exhibit 1. Equilibrium in the hospital services industry

Rather than maximize economic profits, it is assumed that the hospital, as a not-for-profit organization, maximizes the number of patients treated subject to a breakeven level of profits [8, 9]. Maximizing an objective other than profits is consistent with the view that not-for-profit organizations face a non-distribution constraint and cannot legally distribute any excess earning to residual claimants [10]. Maximization of the number of patients is also consistent with the view that not-for-profit hospital administrators and Board members may derive personal utility from directing large enterprises. Thus, the hospital treats Q_0 patients where demand intersects marginal cost. Notice at Q_0, the chosen number of patients exceeds the number that maximizes economic profits where marginal revenue, MR, equals marginal costs. Consequently, the hospital initially operates with some unexploited monopoly power; the second condition necessary for cost-shifting behavior.

In the graphical model on the right, the hospital is treated as a price taker with respect to Medicare patients. It is supposed that the federal government initially sets the fixed administered price, R_0, equal to the marginal costs of treating Medicare patients. The hospital is assumed to treat M_0 Medicare patients during the period. In the initial equilibrium, the hospital earns a normal profit from both private pay and Medicare patients.

To reduce Medicare payments, now suppose the federal government lowers the Medicare reimbursement rate from R_0 to R_1. Exhibit 2 shows the consequence of the Medicare payment rate reduction. Notice when the Medicare payment rate declines to R_1, the hospitals suffers a loss, L, equal to the rectangular area formed by the difference in payment rates and the number of Medicare patients treated.[f] It is this loss that the hospital attempts to shift to private payers.

The hospital now implicitly taxes private payers to cover the loss from treating Medicare patients. The implicit or hidden tax rate, t, equals the loss from treating Medicare patients, L, divided by revenues from private pay patients, or $P_0 * Q_0$. Since t represents an ad valorem tax, the slope of the after-tax demand curve, D_T, declines relative to the pre-tax demand curve and pivots off of the horizontal axis down towards the origin. The tax results in a new equilibrium such that price now equals P_1 and Q_1 private pay patients are treated in the private pay submarket. Because of the assumed constant marginal costs, buyers of hospital services pay the entire tax brought on by the lower Medicaid reimbursement rate and resulting cost-shifting behavior.

Notice that the tax creates a welfare or deadweight loss in the graphical model on the left of Exhibit 2 equal to the area of the triangle labeled as W. The welfare loss triangle captures that the tax creates a distortion in the private submarket by
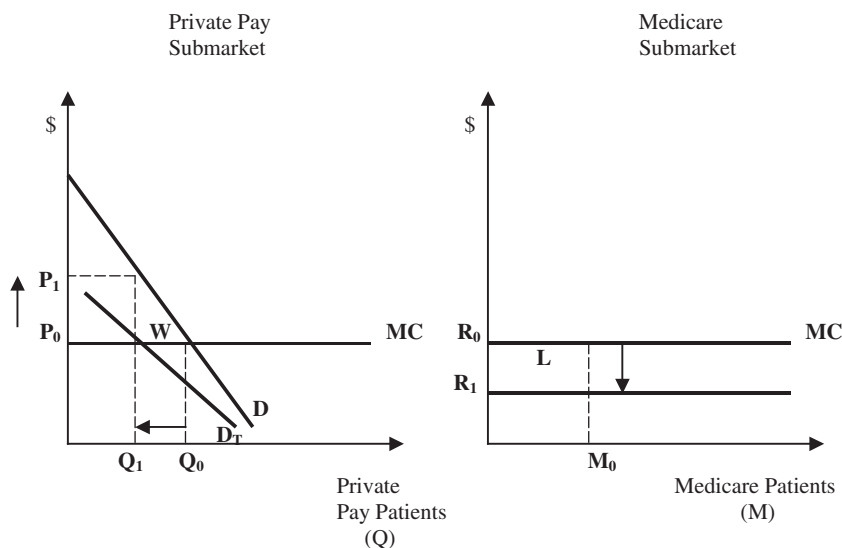

Exhibit 2. The impact of hospital cost shifting

driving a wedge between the price that private buyers pay and the price that hospitals receive for private pay hospital services. In addition, the welfare loss reflects that resources are under-allocated to hospital services at Q_1 because the marginal benefit received by the last private pay patient, as revealed by demand, exceeds the marginal costs of production. Thus, too few private hospital services are produced from a societal point of view, representing an inefficient use of society's scare resources.

Measuring the welfare loss from cost-shifting behavior

Beginning with Harberger [11], economists have recognized that the size of the welfare loss from market distortions can be approximated. Based upon the area of a triangle, the size of the welfare loss translates into $(1/2)\Delta P\Delta Q$. Recognizing that price elasticity of demand, $E_{Q,P}$, equals $\%\Delta Q/\%\Delta P$ and making a few substitutions and algebraic manipulations gives the following formula for the welfare loss, W:[g]

$$W = (1/2)t^2 P_0 Q_0 E_{Q,P} \tag{1}$$

Notice that welfare loss is a linear function of private pay expenditures on hospital services, $P_0 * Q_0$, and the price elasticity of demand for hospital services, $E_{Q,P}$, and a quadratic function of the tax distortion, t.

National data can be obtained for all of the variables in Equation (1) except the price elasticity of demand for hospital services. Health economists tend to agree that the price elasticity of market demand for hospital services tends to be inelastic and lies somewhere between 0.0 and -1.0. So in the simulations below, three progressively larger estimates of the price elasticity of demand for hospital services are used to compute the welfare loss: -0.1, -0.5 and -1.

Data for 1992 are used in the simulation because that year represents the most recent period for which the loss from public payers was relatively sizeable on a national level in the United States. Data for private, Medicare, and Medicaid expenditures on hospital services were gathered on-line from [13]. Private expenditures on hospital services equaled $130.5 billion in 1992. Information on payment to cost ratios for Medicare and Medicaid

Exhibit 3. Estimates of the national welfare loss from cost shifting, 1992

Price elasticity of demand	Total welfare loss	Welfare loss as percent of private hospital expenditures (%)
-0.1	$110.3 million	0.08
-0.5	$551.5 million	0.42
-1.0	$1.1 billion	0.84

patients were obtained from Appendix D in [14] for 1992. Each payment to cost ratio was then multiplied by the respective amount of hospital costs to determine the total amount of losses from treating Medicare and Medicaid patients. According to the calculations, total hospital losses from Medicare and Medicaid patients amounted to roughly $16.9 billion in 1992. Consequently, the private payer tax, t, from cost shifting equaled approximately 13%.

Exhibit 3 provides estimates of the total and percentage welfare loss from hospital cost shifting for different magnitudes of the price elasticity of demand for hospital services. The lower bound estimate with a price elasticity of -0.1 suggests a reduction in consumer welfare of slightly over $110 million or 0.08% of private hospital expenditures as a result of hospital cost-shifting behavior. The upper bound estimate indicates that the total welfare loss amounted to $1.1 billion or 0.84% of private hospital expenditures in 1992.[h] Given that the oft-cited Rand study [16] places the price elasticity of demand for primary care at –0.2, the best estimate of the total welfare loss from hospital cost shifting is double that of the figure shown in the second row of Exhibit 3 or $220.6 million, which amounts to 0.16% of total private hospital expenditures.

However, several assumptions underlie the 'idealized' cost-shifting model; relaxation of these assumptions may alter the magnitude of the welfare loss. First, the model assumes constant marginal and average costs. If hospitals actually face rising marginal and average costs, the not-for-profit hospital would be predicted to operate to the right of the point where marginal costs equal price.[i] Thus, an implicit tax moves the nonprofit hospital in the direction of efficiency, at least over some range of patients. It follows that rising marginal costs mean that the relatively low estimates of the welfare loss shown in Exhibit 3 may be overstated.

Second, the model assumes that all hospitals in the market area are organized as not-for-profits but almost 15% of all community hospitals are organized on a for-profit basis in the US [17]. Because of their profit maximization objective, for-profit hospitals may not initially operate with unexploited monopoly power. As a result, for-profit hospitals face less incentive to raise price to private payers and once again the estimates of the Exhibit 3 may be overstated.[j]

Lastly, the model assumes similar marginal costs for all types of patients. But marginal costs may differ among private-pay, Medicare, and Medicaid patients. For example, Medicare and Medicaid patients tend to be the oldest and poorest among the population and thus marginal treatment costs may be higher for these patients. The distortion caused by dissimilar marginal costs will be particularly pronounced if marginal costs lie below average costs for the different types of patients. This situation is only likely to occur in the short-run, however, as most empirical studies tend to find evidence of constant or increasing cost in the long run [17].

In any case, the 'idealized' model assumes constant marginal costs and similar costs for all payer categories and the analysis relies on MedPac's average (not marginal) cost calculations. As a result, some unwanted bias might have been introduced into the calculations by the assumption of similar marginal treatment costs. Unfortunately, data limitations preclude a determination of the direction of the bias. However, it appears that a sizeable discrepancy would be necessary to produce cost-shifting welfare losses that deviate dramatically from the reported figures in Exhibit 3. For example, suppose true marginal cost figures result in total Medicare and Medicaid losses equal to twice the amount determined by the use of MedPac's average cost figures. Calculations indicate that the resulting welfare loss only amounts to 0.68% of total private hospital services under this condition, assuming that the price elasticity of demand equals −0.2.

Conclusion and policy implications

Health care policy analysts have spent a good deal of time and effort examining hospital cost-shifting behavior. Many economists might be inclined to believe the effort and time have been wasted because mainstream theory suggests cost-shifting behavior is highly unlikely. In addition, empirical research fails to provide any systematic evidence to support the actual practice of cost-shifting behavior.

Not deterred, believers argue that cost shifting generates welfare losses but the magnitude of these losses has not been previously estimated. As a result, this paper simply assumes the practice takes place and develops an idealized yet fairly plausible model to conceptualize and examine the magnitude of the potential efficiency losses caused by hospital cost shifting. The calculations indicate that the welfare loss from cost shifting is relatively small. An estimate, based on the Rand study's finding of a −0.2 price elasticity of demand for primary care, places the annual welfare loss at 0.16% of private hospital expenditures. It follows that society might be better served if health care policy analysts focus their attention on other problems plaguing the health economy.

But of course, the welfare loss analysis is based on a partial equilibrium analysis of the market for hospital services. Within a more general equilibrium framework, the higher hospital prices resulting from cost shifting may lead to increased health insurance premiums which, in turn, may cause privately insured individuals to drop coverage. Welfare losses associated with reductions in private health insurance coverage should be also considered.[k] In addition, any welfare gains from lower taxes to support public health programs must also be weighed when viewing the overall welfare loss associated with hospital cost shifting. The approach taken here offers a useful starting point for such an investigation.

Notes

a. p. 343.
b. p. 490.

c. See Dranove and White [5] for the most recent study providing strong evidence to support the absence of meaningful cost shifting. Like Zwanziger et al. [4], California data for 1983 and the early 1990s are used in their empirical analysis.

d. For example, a recent study suggests a hidden tax of 17% in 2001 from hospital cost shifting in New Hampshire [6].

e. The idea for this graphical exposition comes from [7].

f. However, we cannot rule out the possibility that hospitals respond to the lower Medicare reimbursement rate by releasing Medicare patients quicker and sicker or by dumping these patients onto other hospitals (although illegal).

g. For example, see Appendix 11 in [12] for a formal derivation of the welfare loss caused by an ad valorem tax.

h. If uncompensated care is included in determining the welfare loss, the percentage welfare loss figures range between 0.29 and 2.88%. But the shifting of uncompensated care bills does not fall under the cost shifting definition as proposed by Ginsburg [1]. A recent newspaper article by Lagnado [15] provides some real world evidence that cost shifting may not run rampant in today's health economy. The article points out that hospitals now rank among America's most aggressive debt-collectors, as they put increasing pressure on the poor and uninsured to pay their bills. Often individuals are thrown into jail for failing to pay their hospital debts. But hospitals would simply raise private rates rather than collect debts if they could easily shift costs.

i. For the typical hospital of medium size (e.g. 200 beds), econometric studies and survivor analyses suggest that a marginal adjustment in the number of beds or patients is associated with constant returns to scale [17].

j. The goals of not-for-profit and for-profit hospitals also remain controversial. Despite the existence of a nondistribution constraint facing not-for-profits, empirical studies tend not to find any systematic behavioral differences between hospitals of different ownership types. Sloan [18] argues that physicians on the medical staff may act as residual claimants in not-for-profit hospitals and thus have a financial stake in trying to keep such hospitals as profitable as for-profits. Grawbowski and Hirth [19] point to the possibility that competitive spillovers force health care providers of different ownership type to behave similarly. It also follows that competitive market forces require surviving hospitals of all ownership types to keep their eyes on the financial bottom line.

k. The welfare loss associated with reductions in private health insurance coverage may also be small given the highly price-inelastic demand for private health insurance [17].

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